SCIENTISTS WORRY OVER PCBs AT LANDMARK NIEHS MEETING

Is the scare over polychlorinated biphenyls (PCBs) in the environment justified? Nearly one hundred scientists from around the world gathered in North Carolina last week to discuss PCBs under the auspices of the National Institute of Environmental Health Sciences. Covering the meeting for ANN was McGraw-Hill reporter Wil Lepkowski, a biochemist by training. The tentative conclusion on the basis of "chaotic" data: PCBs are a potentially serious and pressing environmental danger. And brickbats were reserved for Monsanto, the major world producer of PCBs, for not detailing its customers. That attitude could apply to other companies producing long-lived chemicals as well.

Polychlorinated biphenyls are everywhere. Scientists have detected these ubiquitous and toxic chemicals in rainfall, unsedimented Arctic lakes, snow fields and the ocean; they're in the body fat of most birds, fish, animals, and man; they've killed mink in quantities as small as ten parts per million in the body; they've contaminated poultry and have turned up in recycled food packaging materials. Spectacular industrial outbreaks of PCB poisoning have occurred in Japan and West Germany, producing horrendous skin eruption in persons affected by huge doses of thousands of parts per million. They are bad news.

How bad was one reason scientists traveled last week to a rustic North Carolina conference center called Quail Roost. Topics ranged from enzymology to corporate accountability. And among the many policy problems underscored, this one stood out: Monsanto Co., America's sole manufacturer of PCBs and in the PCB production business since the early 1930's, must release more information on the identities of its customers.

The meeting itself was designed to debate scientific rather than policy issues, and summing up the two-day affair was Dr. Norton Nelson, chief of environmental medicine at New York University. Among the top research issues and gaps Nelson underscored:

* Shortage of analytical tools for detecting impurities in test samples of PCBs. There are 210 possible variations. But also mixed in with technical-grade samples are triphenyls and several different reaction products.

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* These complex mixtures point up toxicological problems, too. Which of the hundreds of possibilities actually cause damage? Nelson held up for praise a paper given by J.G. Vos of the University of Utrecht, Netherlands, that tried to tie pathology to specific chemicals within the mixture. Vos showed, for example, that chlorinated dibenzofurans caused edema in test animals, PCBs themselves caused hepatic porphyria, and chlorinated dibenzofurans were responsible for liver damage and skin lesions in various test animals.

* The most advanced biochemical studies of PCB impact on the enzyme system are on the so-called ATP-ases which control the supply of energy to cells. But the details are still skimpy, showing little more than an inhibitory effect, which would be expected anyway. Nevertheless, Nelson said the enzyme approach offers the best technique for understanding the toxicological details of PCB impact on living things.

* There are still too many gaps in determining the ecological flow of PCBs in the environment: where PCBs come from, where they go, and where they end up. Needed are better data on PCBs in rainfall and other atmospheric routes that move them all over the world. No one yet knows whether PCBs are transported in particles or in the vapor phase, or whether in water supplies they move as particles or through microorganisms.

* Too little is known about the breakdown of PCBs in the environment by light or other physical factors, and what part these products play in toxicity.

* Environmental monitoring needs considerable improvement. "It's not clear," said Nelson, "that data are being collected from various forms of the biota in an orderly way. As extension of this kind of analysis occurs, it is going to be inevitable that some general rules of sample selection and placement strategies are going to have to be improved if we're to get a reasonable return."

* Distribution of PCBs in food "has matured pretty well." Food protection authorities have a good idea where PCBs are found in food, Nelson said, and in some instances where they are coming from. Nelson said he was impressed with the similarities between the U.S. and Swedish patterns of PCB occurrences in foods.

* The most disturbing thing from PCB research up to now, said Nelson, "is how extraordinarily ubiquitous these materials are and how without any warning we suddenly discover that they are found everywhere we look, from blood plasma to Arctic lakes."

* Man is more resistant to PCBs than other species studied. Shrimp is the most sensitive of all, killed by concentrations as little as one part per million. Mink is the most sensitive mammal, showing reproductive damage at less than ten ppm. Nelson said that much more work needs doing on species susceptibility differences and said he couldn't "take much comfort from the Monsanto data" that showed scant toxicity to rats in concentrations as high as 100 ppm. Studies done elsewhere, Nelson said, have turned up some evidence of bladder cancer in rats. "The picture is clearer than it was six months ago but still far from clear. And the biggest gaps I see are to look for malignancies much more closely, run down this disparity between species which stands as a real puzzler, and gross patterns of toxicity."

* Nelson also said the field would remain chaotic and get nowhere unless researchers agreed to choose up to ten out of the some 210 possible PCB isomers and do thorough toxicological research on each. Until they do, he said, there would be no way to meaningfully compare data on any type of pathology.

But picking out the choice ten for study won't be easy. Last month, after considerable pressure from environmentalists and the federal government, Monsanto finally released its production figures: 42,500 tons produced in 1970, 353,000 tons manufactured since 1960. But that dope is not enough to satisfy the researchers. As Nelson put it: "It is inexcusable that chemists still have to run around with test tubes analyzing materials suspected of containing PCBs. There is a public responsibility here which

would require as a first step that there be an open disclosure of sources and use of these hazardous materials."

The movement of PCBs through the industrial environment may be easier to trace now, since Monsanto has limited the sale of PCBs to customers using them in such internal, closed environment systems as heat exchangers outside the food industry, transformers and capacitors. Monsanto has also begun a program of calling back to its Sauget, Ill., plant for disposal all used PCB-containing equipment.

But up to a few months ago, PCBs were going into industrial and road paints, hydraulic fluids, lubricants, cardboard sealants and putties, soil stabilizers and purposes not even Monsanto has imagined. There are studies to trace the environmental flow of PCBs, from origin to end organisms, but the efforts so far are primitive, mainly because no one will talk about sources. Many scientists suspect PCB fallout from jet airliners. But the airlines so far haven't disclosed whether they are still using PCBs in their lubricants or hydraulic fluids.

Further pressure related to occupational safety could raise Monsanto's sweat quotient. Since PCBs are toxic they pose not only an environmental but an occupational threat at both the manufacturing and usage level. The Health, Education and Welfare Department's Occupational Safety and Health Institute has the authority to step in and order Monsanto to disclose clinical data on workers involved in PCB manufacture. Neither the Council on Environmental Quality nor the Office of Science and Technology has pressed such an effort.

CEQ's Terry Davies, co-chairman of the interagency *ad hoc* PCB committee, says there are no plans to begin such a study in election-year 1972. "PCBs are not high on the occupational health priority list," he says. But he indicated the day after the Quail Roost meeting that such a study would be recommended.

The slowness of the federal government to press Monsanto for easily obtainable health data points up the traditional leadership void still remaining over environmental policies. Lacking a toxic substances act there is no federal agency for concentrating policy decisions--primarily for getting needed information instantly from private enterprise--short of a Presidentially declared national emergency. Decisions thus are made obliquely and seldom get to the heart of a problem. Most of the public turns to the Environmental Protection Agency as the chief spokesman. Most action over PCBs has come so far from the Food and Drug Administration, under its food protection mandate. But FDA has no power to regulate the non-food industries.

The major fallout from the Quail Roost meeting from the buttonhole effect: A mammalian toxicologist could debate with a fishery scientist why high-chlorine PCBs are more toxic to birds than low chlorine PCBs, and why the fish follow the opposite pattern. Another research policy issue punctuated was the need for scientists to specify dosages in their toxicity studies. E.P. Lichtenstein of the University of Wisconsin told AWN that 10 to 50 parts per million were the significant concentrations to keep in mind as relevant to human health effects. Anything larger was unrealistic.

One issue remained totally unanswered at the meeting: Long-term chronic effects of PCBs. That work is just beginning. And it was agreed that the PCB issue won't wither away as has the mercury toxicity scare. Background levels of mercury were just as high 50 years ago as they are today in many areas. Not so with PCBs. They are a man-made chemical and they stay around a long time.

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THE STATES: NEWS IN BRIEF

CALIFORNIA: Gov. Ronald Reagan has signed into law a bill prohibiting the state from doing business in excess of $5,000 with any persons or firms not complying with air and water pollution laws and regulations.

COLORADO: The state attorney general's office has ruled that the Air Pollution

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