

Dioxin A Nationwide Concern

By Philip Shabecoff

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WASHINGTON

CONCERN IS GROWING among public health officials, scientists and legislators that contamination by dioxin, one of the most toxic substances created by man, may turn out to be a serious national problem for which they are ill-prepared.

Recent tests have confirmed dioxin contamination at 22 places in Missouri, and state officials fear the chemical may pollute more than 50 sites there. In 1979, the Environmental Protection Agency prepared a list of 31 cities where chemical manufacturing was likely to produce waste contaminated with dioxin and destined for the nation's dumps for hazardous wastes. Those dumps number in the thousands; their contents are largely unknown.

There is no reliable information about how much dioxin has been produced or where it is, and there is considerable controversy over what danger it poses to health and the environment. Nobody knows for sure.

Rep. James J. Florio, D-N.J., co-author of some of the key legislation regulating hazardous wastes, is worried about the scarcity of information. "This is something of extreme gravity and we have to treat it as such," he said. "I'm not saying we have to burn down every town in the country that has been exposed to dioxins, but this problem deserves close scrutiny, closer than other things."

Richard C. Fortuna, staff toxicologist for the House Energy subcommittee headed by Florio, said, "We know that dioxin is a serious environmental problem, but we don't know yet if it is a national emergency."

ADMINISTRATION OFFICIALS and chemical industry executives do not see any emergency. They view the contamination in Missouri as an aberration and believe there are few if any other areas in the country where dioxin presents a significant health problem. In the hazardous waste dumps, they observe, dioxin clings tightly to soil particles and is nearly insoluble in water. And in Missouri, they contend, the dangers to exposed humans have been exaggerated in public accounts.

"It gets me that some scientists are saying that dioxin is the most deadly chemical known to man," said Rita M. Lavelle, assistant administrator of the EPA until she was dismissed Feb. 7. "That's not true. It depends on the concentration. In the right concentration, table salt is just as deadly."

Ms. Lavelle, who was in charge of protecting the public from hazardous waste and responding to emergencies such as the one in Missouri, belittled the significance of dioxins as a threat to the environment and public health in an interview before she left office.

"I am more worried about the threat of other chemicals," she said. "Dioxin is not a national threat."

Dioxin is the name given to any of a family of 75 compounds called dibenzo-para-dioxins composed of benzene and oxygen atoms. When chlorine atoms are added, they become chlorinated dioxins, which have been found to be toxic at low concentrations.

LABORATORY TESTS on animals have linked chlorinated dioxins, even in tiny amounts, to birth defects, skin disorders, liver ailments and other problems. Concentrations as small as five parts per 1,000 billion have caused statistically significant increases in cancer in rats. A single oral dose of 25 micrograms can kill a two-pound chicken. There are a million micrograms in a gram and a thousand grams in a kilogram, and one estimate is that more than 80 kilograms of dioxin was produced in chemical manufacturing in the United States every year from the 1950s to the mid-70s. Yet dioxin's effects on humans, particularly long-term risks, are not clearly understood.

Florio is concerned about what he views as legal loopholes that would allow dioxin to continue to move into the environment if it was contained in waste oils that might be recycled, as they were in Missouri, leading to the contamination there. He says the EPA should follow the recommendation of its staff to declare dioxins a "hazardous air pollutant," an action the agency has not yet taken.

Similarly, Dr. Ellen K. Silbergeld, chief toxics scientist for the Environmental Defense Fund, a not-for-profit environmental group, said the agency had not acted on long-pending recommendations by its staff that new rules should limit dioxin in water supplies to fractions of a part per 1,000 billion.

William N. Hedeman Jr., director of the environmental agency's Office of Emergency Response, said in an interview, "To the best of my knowledge, there are no other Russell Bliss situations around the country." Russell Bliss is the contractor who sprayed the waste oils containing dioxin on horse arenas and roads in Missouri.

Hedeman said he was not aware of other areas where dioxin had posed a problem except for Love Canal in Niagara Falls, N.Y., where it was found in an abandoned chemical dump. But he acknowledged, "We don't know how much is out there. We don't know where it is." On the EPA's 1979 list were 31 cities around the country where plants produced chlorophenols. The manufacture of these chemicals produces dioxins, including the deadly 2,3,7,8-T — tetrachlorodibenzene-p-dioxin, TCDD, as an unwanted byproduct.

The cities on the agency list were St. Louis; Sauget, Ill.; Tuscaloosa, Ala.; Jacksonville, Ark.; Fremont, Calif.; San Mateo, Calif.; Orlando, Fla.; Chicago; Chicago Heights, Ill.; Naperville, Ill.; Shenandoah, Iowa; Kansas City, Kan.; Wichita, Kan.; Whiteford, Md.; Midland, Mich.; St. Paul; St. Joseph, Mo.; Springfield, Mo.; Verona, Mo.; Clifton, N.J.; Linden, N.J.; Rahway, N.J.; Niagara Falls, N.Y.; Cleveland; Dover, Ohio; Portland, Ore.; Ambler, Pa.; Philadelphia; Port Neches, Texas; Tacoma, Wash.; and Nitro, W. Va.

The National Institute of Occupational Safety and Health, an arm of the Department of Health and Human Services, is now working on an updated and more complete "national registry" of producers of products that leave dioxins as a byproduct.

Dr. William Halperin, chief of the institute's industrywide studies branch, said a major purpose of the registry was to locate workers exposed to dioxin on the job so that the effects of the chemical on their health can be studied.

SINCE THE LATE 1970s, the use and production of many of the products that cause the formation of TCDD have been restricted, although not entirely banned. But a significant if unknown amount of dioxin was introduced earlier into various waste streams, and it is likely that some is still escaping into the environment through a variety of routes, including the combustion of wastes.



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A rough guess at the amount of dioxin discharged into the environment was made in a recent interview by Dr. Alvin Young, an environmental scientist for the Veterans Administration. Dr. Young is a specialist in that agency's efforts to deal with the problems resulting from Vietnam veterans' exposure to Agent Orange, a defoliant that includes the herbicide 2,4,5-T, which is associated with TCDD. He said available figures showed that in 1975 about 800,000 gallons of products associated with TCDD had been produced. From what is known about the dioxin residues in the manufacturing process, he estimated that about 2.1 kilograms of dioxin was contained in the products themselves and about 80 kilograms was left over as waste in that year. A kilogram is about 2.2 pounds.

Dr. Young said that at least that amount of dioxin had been produced annually since the 1950s. While the yearly production has been sharply reduced since 1975, "that is a hell of a lot of dioxin," he said. But he said he did not think dioxin constituted a national health problem, though it might pose a problem in specific areas of the country.

There is broad agreement that a substantial proportion of dioxin-contaminated wastes are now buried in dumps around the country. Anne M. Gorsuch, administrator of the Environmental Protection Agency, recently said there were 12,000 of these "ticking time bombs"; other experts have put the number of toxic dumps at 50,000 or more. There is little if any information on the content of most of these sites. The EPA recently issued a list of 418 "priority" sites, but it has just begun to act on some of these areas. Administration officials and chemical companies contend that the dioxins in the waste dumps do not constitute a serious threat because they adsorb strongly to soil and are not water-soluble; therefore, the officials say, they are unlikely to seep into water tables.

But some environmentalists contend that other solvents in the dumps could flush the dioxin into the water.

RELATIVELY HIGH LEVELS of dioxin have been found in gulls' eggs and fish taken from the Great Lakes and in waterfowl in the North Central states. Dr. Young noted that dioxins tend to collect in silt and are ingested by bottom-dwelling animals, such as crayfish and turtles.

The spraying of Agent Orange and other pesticides and herbicides introduced dioxin directly into the environment. Some of these uses have been suspended by government order, but other applications continue. Industry officials and some administration authorities argue that dioxin breaks down rapidly in sunlight and therefore disappears quickly from the surface.

But surface contamination found in Missouri after many years has led other scientists to question whether sunlight does cause the deadly substance to disappear. And the manufacturing of some other products still in use forms dioxins as byproducts.

Another route by which dioxin can enter the environment is through fires involving transformers or other electrical equipment containing polychlorinated biphenyls, or PCBs. When burned at low temperatures, these release substances called "furans," which are closely related to dioxins, according to scientists at the EPA.

One of the scientists said that such a fire several years ago in a government office building in Binghamton, N.Y., produced "maybe the only building in the country where you can't find a single cockroach." The building has stood empty since.

Fires or explosions at plants that produce pesticides, herbicides and other products that involve dioxin, such as the explosion at the Hoffmann-LaRoche plant in Seveso, Italy, on July 10, 1976, can also provide a path through which dioxin enters the environment.

In 1980 a study by scientists of the Dow Chemical Co. suggested that dioxin could be released from the combustion of organic materials. They found dioxins in car mufflers, fireplace soot, charcoal-grilled steaks, cigarette smoke and a variety of other sources.

Etcyl Blair and Perry J. Gehring, Dow scientists and officers, said in a telephone interview that while it was true that dioxin was present in the environment and was highly toxic, it did not constitute a serious problem. "There is a difference between toxicity and hazard," Blair said. "Just because it is a risk doesn't mean you are in danger." He asserted that there were no cases where exposure levels had proved to be a hazard to humans and added, "Statements about how much of the stuff can kill so many people are just not productive."

The Dow officials said that employees working with dioxin in the 1960s had developed chloracne, a skin disease, but that surveillance of the workers had turned up no pattern of serious illness.

THERE APPEARS to be no agreement in among scientists on the health effects of dioxin where it is known to have entered the environment in substantial quantity: Missouri, Love Canal, Vietnam and Seveso.

But Dr. Henry Falk, chief of the special studies branch of the federal Centers for Disease Control, remarked that dioxin contamination was "very much regarded as a significant public health problem that needs to be handled with extreme care."

"There undoubtedly are other Russell Blisses around the country," Dr. Falk said. "We haven't systematically approached all of the past producers to identify where their products are. That would really be an extensive job."

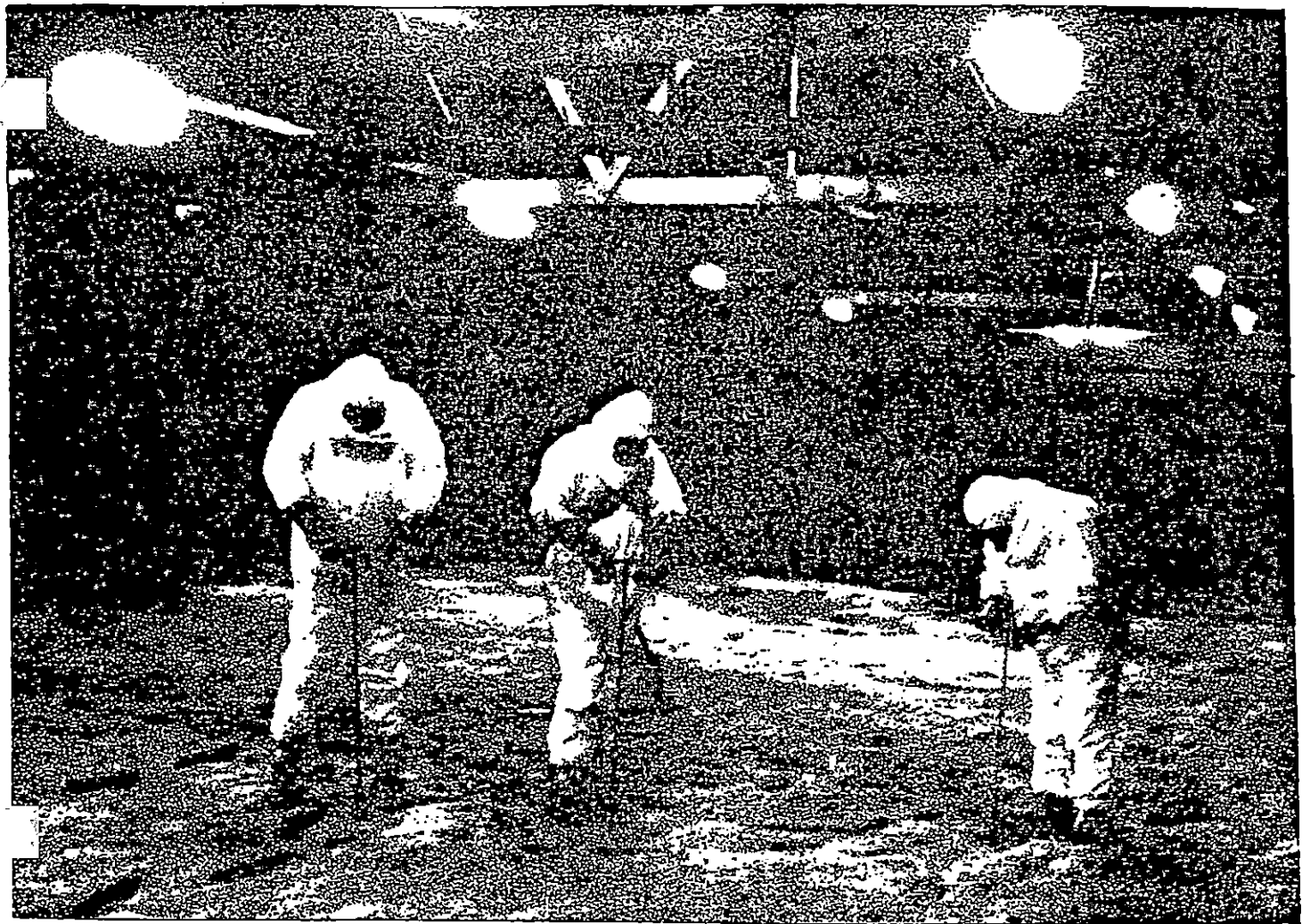
He also said that the acute effects were not the only problem created by dioxin in the environment. "There is a lot of uncertainty about the long-term effects on people," he said.

Halperin of the National Institute of Occupational Safety and Health said, "In an occupational setting, exposure to dioxins is clearly a problem." He explained that data collected by Swedish epidemiologists as well as his own studies suggested that exposed workers faced a substantial risk of soft-tissue sarcoma, a malignant growth.

"What we can say about dioxin," Halperin said, "is that it is an extremely toxic agent whose long-term consequences are only beginning to be understood."

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