

The History of PCBs When Were Health Problems Detected?

1865-1972

[1973-2001](#)

PCB history is not pretty. As the timeline shows, the manufacturers and major users of PCBs knew by the 1930s and 1940s that PCBs caused serious health problems in their workers, and doctors advised them that other effects could be occurring as well. But this did not stop industries from producing and using PCBs, or from releasing PCBs into our environment, contaminating our public waterways, air, croplands, and wildlife. It appears from this PCB history that several companies also deliberately misled workers, customers, regulators and the public for many decades, allowing the PCB problem to spread and become much worse. Our local *PCB history* began in 1954, when Appleton Paper Company and NCR Corporation began using large quantities of PCBs, incorporating them into consumer products, and releasing them into the public waters of the Fox River and Green Bay. They should have known PCBs had serious toxic properties, because it would likely have become evident in their own workers, as it became evident to other companies. Certainly, before releasing the PCBs into the river, the company should have conducted laboratory health studies to determine whether this was safe.

Timeline

1865 --- First PCB-like chemical discovered; a by-product of coal tar.

1881 --- First PCBs synthesized. [\[2\]](#)

1914 --- Enough PCBs had already escaped into the environment to leave measurable amounts in the feathers of birds held in museums today. [\[3\]](#)

1927 --- PCBs were first manufactured commercially by the Anniston Ordnance Company, in Anniston, Alabama. [\[4\]](#) The Anniston Plant's legacy began in 1915 when Theodore Swann founded the company to manufacture six-inch explosive shell cases for the U.S. Army. To see photos and learn what the Anniston plant makes now, visit <http://www.solutia.com/corporate/worldwide/anniston.html>

1930 --- The company's name changed to the Swann Chemical Company. [\[4\]](#)

1933 --- Problems soon arose at the manufacturing plant. 23 out of 24 workers in the plant had acne-like pustules on their faces and bodies. Some complained of loss of energy, appetite and libido as well as other skin ailments. These symptoms are now known as classic first signs of PCB exposure. [\[6\]](#)

1935 --- Swann was purchased in 1935 by the Monsanto Industrial Chemical Company of St. Louis, Missouri. Monsanto produced PCBs at plants in Sauget, Illinois and Anniston, Alabama (until 1977.) [\[5\]](#) Monsanto then licensed others to make PCBs and the product took off. PCB's have been produced in other countries including Italy (Caffaro), France (Protolec), Japan (Kanegafuchi Chemical Co.), Germany (Bayer), and they may still be produced in Russia. [\[7\]](#) As electricity came into widespread use during the first half of this century, equipment suppliers like GE and Westinghouse became major users of PCBs. One Monsanto engineer allegedly called it "as perfect as any industrial chemical can be." [\[8\]](#)

1936 --- A senior official with the U.S. Public Health Service described a wife and child, both of whom had developed chloracne, a combination of blackheads and "pustules," merely from contact with a worker's clothes. The same official wrote, "In addition to these skin lesions, symptoms of systemic poisoning have occurred among workers inhaling these fumes."^[9]
1936 - Scientists issued a report attributing the plant workers' disease symptoms to poor handling techniques and the "natural laziness of the black man."^[6]



1937 --- A study published in the Journal of Industrial Hygiene and Toxicology suggested links between PCBs and liver disease.^[10]

1937 --- The Harvard School of Public Health hosted a one-day meeting on the problem of "systemic effects" of certain chlorinated hydrocarbons including "chlorinated diphenyl" (an early name for PCBs).^[10] The meeting was attended by representatives from Halowax Corp., Monsanto, General Electric, the U.S. Public Health Service, state health officials from Massachusetts and Connecticut, and others. Before World War I, the Halowax Corporation, in New York City, began manufacturing chlorinated naphthalenes as a coating for electric wire, and companies like General Electric began using it. The president of Halowax, Sanford Brown, told the meeting that they had observed no problems in their workers until "the past 4 or 5 years... Then we come to the higher stages [greater number of chlorine atoms in the mixture], combined with chlorinated diphenyl and other products, and suddenly this problem is presented to us."^[10] By the mid-1930s, workers at Halowax and at GE, and even some of their customers, were breaking out with chloracne—small pimples with dark pigmentation of the exposed area, followed by blackheads and pustules. In 1936 three workers at the Halowax Company died. Autopsies of two revealed severe liver damage. Halowax then hired Harvard University researcher, Cecil K. Drinker, to investigate. He exposes rats to these chlorinated compounds, to see if they could discover the underlying cause. The Harvard researchers made "a number of estimates of chlorinated hydrocarbons in the air of different factories," then designed experiments to expose rats to similar levels. The rats also suffered from severe liver damage. Conference notes report that "**the chlorinated diphenyl is certainly capable of doing harm in very low concentrations and is probably the most dangerous [of the chlorinated hydrocarbons studied].**"^[10] Dr. Drinker added, "These experiments leave no doubt as to the possibility of systemic effects from the chlorinated naphthalenes and chlorinated diphenyls."^[10] From a brief report on the one-day conference, we can gather that problems caused by PCB exposures were serious and widely known. Mr. F.R. Kaimer, assistant manager of General Electric's Wireworks at York, Pa., said, "It is only 1 ½ years ago that we had in the neighborhood of 50 to 60 men afflicted with various degrees of this acne about which you all know. Eight or ten of them were very severely afflicted—horrible specimens as far as their skin conditions was concerned. One man died and the diagnosis may have attributed his death to halowax vapors, but we are not sure of that...."^[10] GE's medical director, Dr. B. L. Vosburgh of Schenectady, N.Y., attended the meeting. He said, "About the time we were having so much trouble at our York factory some of our customers began complaining. We thought we were having a hysteria of halowax mania throughout the country." Monsanto Chemical Company was represented at the meeting by R. Emmett Kelly. Mr. Kelly told the meeting, "I can't contribute

anything to the laboratory studies, but there has been quite a little human experimentation in the last several years, especially at our plants where we have been manufacturing this chlorinated diphenyl." He went on to describe the results of Monsanto's human experiments: "A more or less extensive series of skin eruptions which we were never able to attribute as to cause, whether it was impurity in the benzene we were using or to the chlorinated diphenyl."[\[10\]](#) GE's F.R. Kaimer described the HUMAN reaction of GE executives to the disfigurement and pain of GE workers exposed to PCBs: "[W]e had 50 other men in very bad condition as far as the acne was concerned. The first reaction that several of our executives had was to throw it out—get it out of our plant. They didn't want anything like that for treating wire. But that was easily said but not so easily done. We might just as well have thrown our business to the four winds and said, 'We'll close up,' because there was no substitute and there is none today in spite of all the efforts we have made through our own research laboratories to find one."[\[10\]](#) And so GE executives—contrary to their personal ethics—reached a business decision to continue using PCBs. Sanford Brown, the president of Halowax, concluded the meeting by stressing the "necessity of not creating mob hysteria on the part of workmen in the plants" where chemical-safety inspections were being made. Problems with PCBs and naphthalenes, he predicted, "may continue, probably will continue for years."[\[11\]](#)

1938 --- A study of PCB-oil mixtures manufactured by Westinghouse and GE demonstrated that liver damage could be caused by skin contact alone, and called for the "greatest personal hygiene" in minimizing exposure. In further research for Monsanto, Drinker warned that adequate ventilation was necessary when handling the chemicals. [\[11\]](#)

1947 --- E.C. Barnes of Westinghouse's medical department wrote, in an internal company memo, that long-term exposure to PCB fumes "may produce internal bodily injury which may be disabling or could be fatal."[\[7\]](#)

1947 --- GE began using PCBs in the manufacture of electrical equipment at its Ft. Edward plant on the east shore of the Hudson River. Soon, GE began mixing PCBs with oil in their own formula they called Pyrosol. In 1952 it began using PCBs in its plant in Hudson Falls. By 1977, GE had dumped 500,000 to 1.5 million pounds of PCBs in the Hudson River. [\[6\]](#)



1949 --- An explosion occurred at a Monsanto chemical factory in Nitro, West Virginia; as a result, many workers in the plant were exposed to the herbicide 2,4,5-T, which was contaminated with dioxin. (This herbicide was later the principal component of Agent Orange, the chemical defoliant used by the U.S. in Vietnam.) In subsequent years, two Monsanto scientists, J.A. Zack and R. W. Gaffey, studied the exposed workers, comparing their health against the health of a similar group of workers who were not exposed to dioxin or 2,4,5-T.[\[12\]](#) According to court documents "Zack and Gaffey deliberately and knowingly omitted 5 deaths

from the exposed group and took four workers who had been exposed and put these workers in the unexposed group, serving, of course, to decrease the death rate in the exposed group and increase the death rate in the unexposed group." Other studies of this same accident were also fraudulent, according to the same court documents, including a study by R.R. Suskind published in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION: "This published study of the workers exposed in the 1949 accident reported only 14 cancers in the exposed group and 6 in the unexposed group (a smaller cohort). However, the medical records produced [by Monsanto] to the Plaintiffs conclusively prove gross miscalculations and omissions... there were 28 cancers in the group that had been exposed to dioxins in 1949 as opposed to only 2 cancers in the unexposed group." Mr. Suskind published two other reports on the same accident, using his same data, to reach the conclusion that dioxin does not cause cancer. [\[13,14,15\]](#) This experience raises concerns about the honesty of any Monsanto PCB data as well. (PCBs are very similar to dioxins, and are often contaminated with dioxins.)

1950 --- A GE instruction manual for PCB transformers assured utilities that "transformer Pyranol [GE's trade name for PCBs] may be handled in the same manner as mineral oil." [\[11\]](#)

1951 --- Monsanto also had in its files a 1947 scientific finding that there was "need to give warning" about PCBs because "the toxicity of those compounds has been repeatedly demonstrated." [\[11\]](#)

1953 --- Although Monsanto was the sole domestic manufacturer of PCBs, Westinghouse prepared its own Material Safety Data Sheets and Safe Practice Data Sheets for PCB-laden fluids. In fact, Westinghouse's in-house knowledge about PCBs was so sophisticated that the company participated in federal and industry task forces and working committees on PCBs. [\[16\]](#)

1954 --- Appleton Paper Company began making PCB coated carbonless copy papers, and discharging PCB contaminated wastewater to the Fox River. [\[45\]](#)

1956 --- Monsanto considered the chemicals toxic enough to give workers protective gear and clothing, and encourage them to hose off after each shift. Monsanto researchers and executives began writing confidential memos describing their fears about the chemicals' toxic effects, but they drafted plans for continuing to sell them despite these suspicions. Along with other chemical manufacturers, the company publicly expressed skepticism about PCBs' association with disease, but over the next decade the evidence became harder and harder to dismiss. [\[5\]](#)

1956 --- Monsanto knew that PCB products could be contaminated with dioxins and dibenzofurans from the time they were shipped from the factory—a piece of information it sat on until the late 1960s, when independent researchers discovered this hazard. According to the record of one lawsuit, new PCB oil can be contaminated with dibenzofurans at concentrations of up to 10 parts per million. As the oil ages, according to documents from Monsanto's files, the concentration becomes considerably higher. [\[11\]](#)

1956 --- GE's files contained a bibliography of 43 references on the health dangers and possible lethality of PCBs and PCB component chemicals. [\[11\]](#)

1957 --- From 1957 to 1977, the Westinghouse Electric Corporation (now owned by CBS) manufactured electrical capacitors in Bloomington, Indiana using "Interteen" (a mixture of PCB Arochlors in mineral oil) as a dielectric (insulating material). The city now has several contamination sites, including some Superfund sites due to PCBs. [\[17\]](#)

1959 ---- The assistant director of Monsanto's Medical Department wrote to the Administrator of Industrial Hygiene at Westinghouse saying, "...sufficient exposure, whether by inhalation of vapors or skin contact, can result in chloracne which I think we must assume could be an indication of a more systemic injury if the exposure were allowed to continue."[\[18\]](#) Monsanto

also sent Westinghouse animal toxicity studies on PCBs and Material Safety Data Sheets with specific warnings about the risks of overexposure.

1964 --- A Swedish researcher, Dr. Soren Jensen, was trying to study DDT levels in human blood when a mysterious group of chemical compounds kept recurring in his samples, interfering with his analyses. The chemical was so pervasive that his first task was to determine whether it was natural or synthetic. Tests had to be developed to distinguish PCBs from the pesticide DDT. A two-year investigation established that the mystery compound was chlorine-based and chemically similar to DDT. Jensen knew it wasn't a pesticide, though, because he found it in wildlife specimens collected in 1935, years before chlorine-based pesticides were in general use. All of Sweden and its adjacent seas were contaminated, even hair samples taken from his wife and three children showed traces of the compound, with the highest levels in his nursing infant daughter. The mystery pollutant was everywhere he looked. Eventually, Jensen says, "I was convinced that what I had to deal with were chlorinated biphenyls, but I didn't have the faintest idea where such compounds were used in the society." Searching the literature, Jensen learned of PCBs' industrial uses. A German chemical manufacturer provided Jensen with a sample, which he analyzed and found to match the "peaks," or chemical readings, found in a massively contaminated white-tailed eagle. [\[11\]](#)

1965 --- Monsanto knew that dioxin "can be a potent carcinogen." Dioxin is frequently a contaminant in PCB mixtures. [\[11\]](#)

1966 --- The general scientific community first became aware of PCBs as an environmental problem when a Dr. Jensen published his research which found PCBs in 200 pike from all over Sweden, in other fish, and in an eagle. The report revealed the capacity of PCBs to "bioaccumulate along the food chain." The chemicals, which take many years to biodegrade, pass easily through the lipid portions of cell membranes and are readily absorbed into mammalian fat tissue. Animals at the top of the food chain, like whales, polar bears, dolphins and humans, can store PCBs at highly concentrated levels. [\[19\]](#) For the next decade, scientists accumulated information about PCBs, finding them disrupting food webs all over the planet. "Truly the PCBs are a worldwide ecological problem," declared a Monsanto company memo that included a list of concerns under the heading "Business Potential at Stake on a Worldwide Basis." [\[5\]](#)

1967 --- According to Monsanto telephone logs, Shell Oil called to inform the company of the Swedish press reports, and to ask for PCB samples for its own analytical studies. [\[11\]](#)

1968 --- After Jensen's discovery, Monsanto executives visited him in Sweden, and company records indicate that Monsanto obtained an unpublished 1968 paper he wrote with two colleagues detailing the analytical method for detecting PCBs in the environment. Neither did Riseborough's findings take the company by surprise: a January 18, 1968, internal memo about PCBs in shorebirds warns a Canadian colleague to "expect publication from California." [\[11\]](#)

1968 --- 1,300 residents of Kyushu, Japan, fell ill after eating rice-bran oil (yusho) contaminated with PCBs fluids. Many showed immediate symptoms including severe chloracne, respiratory ailments, and failing vision. Two out of 12 children were stillborn and nearly all of the babies showed signs of PCB diseases. Since then, more than 50 people have died; many with internal tumors and irregular lymph nodes and livers. Subsequent studies published in leading medical journals showed that PCBs cause a statistically significant increase in lung cancer [\[20\]](#), and damage to the immune system, reproductive system, nervous and endocrine system. It was from the "Yusho Incident" that scientists would soon document birth defects, low birth weights, and numerous other chronic effects from PCB exposure. Nine years after, there was a sixfold

increase in liver-cancer deaths among affected men and threefold among women. Ultimately, researchers found liver cancers at 15 times the normal rate. Despite international attention to the Yusho Incident, just two months later Monsanto's corporate-development committee set a four-year goal of increasing by 20 times its sales of Therminol heat-transfer fluid - essentially the same PCB product that poisoned the Japanese victims. In the United States, Therminol was used as a heating medium inside the coils of deep-fat fryers. [7,11]

1968 --- Workers at a Westinghouse plant in Bloomington, Indiana, began to ask questions after the poisoning in Japan. They say, Westinghouse officials led them to believe PCBs were entirely safe. Morrow, a former union local president at the plant, recalls employee meetings in which then-plant Donald M. Sauter "washed his hands and face in what he told workers was liquid PCBs to convince to worry."



A Westinghouse spokesman, Christopher C. Newton, confirmed for BUSINESS WEEK magazine that Sauter "dipped his hands" into PCBs at a meeting. [1]

1969 --- Widespread PCB contamination of the food chain in the United States was first demonstrated by Dr. Robert Riseborough of the University of California at Berkeley, who happened upon it in the course of his research on peregrine falcons. [3] San Francisco Chronicle reporter David Perlman learned about Riseborough's findings; his story, "A Menacing New Pollutant," ran on February 24, 1969, and was picked up by numerous other papers. Monsanto launched its public-relations defense the next day by denying that the chemicals were PCBs. "The Swedish and American scientists . . . imply that polychlorinated biphenyls are 'highly toxic' chemicals," Monsanto said in a statement widely distributed to its customers and the press. "This is simply not true. The source of marine-life residue identified as PCB is not yet known. It will take extensive research, on a worldwide basis, to confirm or deny the initial scientific conclusions." [11]

1969 --- Between 1969 and 1971, at least 9 major food contaminations occurred with PCBs. [11]

1969 --- Monsanto wrote a "Pollution Abatement Plan," which admitted that "the problem involves the entire United States, Canada and sections of Europe, especially the United Kingdom and Sweden.... [O]ther areas of Europe, Asia and Latin America will surely become involved. Evidence of contamination [has] been shown in some of the very remote parts of the world. They knew "the evidence proving the persistence of these compounds and their universal presence as residues in the environment is beyond questioning." The plan warned that "the corporate image of Monsanto as a responsible member of the business world genuinely concerned with the welfare of our environment will be adversely affected with increased publicity." More to the point, "direct lawsuits are possible" because "all customers using these products have not been officially notified about known effects nor [do] our labels carry this information." The plan proposed three options, with charts showing their potential profits and liabilities. Should Monsanto "Do Nothing," profits would likely decline and liability extend into the future. "We cannot deny the findings and the accusations of various agencies," the plan said. "If we took no action we would likely face numerous suits." Under the "Discontinue Manufacture of PCB" option, profits would cease and liability would soar because "we would be admitting guilt by our actions." But with the "Responsible Approach," which involved acknowledging certain aspects of the problem, tightening restrictions, and continuing to manufacture and sell PCBs, profits theoretically would increase and liability slowly decline, all but vanishing by the mid-1970s. It was this latter approach that Monsanto chose, making some

adjustments to its business practices but going to battle with the government to keep PCBs on the market, despite growing scientific evidence that they constituted a public-health menace and an environmental nightmare. Henceforth, Monsanto required its customers to sign indemnity agreements to hold it harmless from any future liability. Monsanto also vowed to sell PCBs only to customers who would use them in "totally enclosed systems" - even as it continued to market PCBs in products that directly contacted food. [\[11\]](#)

1969 --- Monsanto established a committee to keep abreast of the state of knowledge on PCBs. The issue was beginning to look like "a monster," in the words of one former executive. According to the notes of one Monsanto researcher, these were the thoughts of the group: "Make the Govt., States and Universities prove their case, but avoid as much confrontation as possible.... We can prove some things are OK at low concentration. Give Monsanto some defense.... We can't defend vs. everything. Some animals or fish or insects will be harmed.... The Dept. of Interior and/or state authorities could monitor plant outfall and find [discharges] of chlorinated biphenyls at...Anniston anytime they choose to do so. This would shut us down depending on what plants or animals they choose to find harmed..." Also, he wrote: "Problem: Damage to the ecological system by contamination from polychlorinated biphenyl (PCB). Legal Liability: Direct lawsuits are possible. The materials are already present in nature having done their "alleged damage." All customers using the products have not been officially notified about known effects nor [do] our labels carry this information." Public Image: The corporate image of Monsanto as a responsible member of the business world genuinely concerned with the welfare of our environment will be adversely affected with increased publicity. [\[5\]](#)

1969 - The National Environmental Act was passed by Congress. This required an Environmental Impact Assessment (EIA) for every major new project. It also focused the country's attention on the conditions of our rivers. [\[6\]](#)

1969-1970 --- Paper company discharges of PCBs into the Fox River peaked.

1970 --- Annual U.S. production peaked this year, with 85 million pounds of PCBs produced. [\[21\]](#)

1970 --- Monsanto physician Emmett Kelly revealed to W. B. Papageorge that tons of cattle feed from several Ohio silos had been contaminated by leaching and flaking paint based on the company's Aroclor 1254 PCB-oil. As a result, milk from three herds was tainted. Kelly estimated up to 50 other silos in the state were painted similarly. "All in all, this could be quite a serious problem, having legal and publicity overtones," the Monsanto doctor warned. "This brings us to a very serious point. When are we going to tell our customers not to use any Aroclor in any paint formulation that contacts food, feed, or water for animals or humans? I think it is very important that this be done.... I think we should make a blanket recommendation against these uses." Despite years of discovery in lawsuits, Monsanto has not produced any evidence that such a warning was issued. [\[11\]](#)

1970 --- Monsanto purchased 50 hogs from Jeremiah Smith, local farmer in Anniston, Alabama, after the hogs grazed on property near the company's PCB plant. The hogs were shot and buried, not sold for market. Local residents cite this as evidence that the company knew about serious local contamination but didn't warn the public, who continued to eat PCB contaminated local foods for decades to come. The Agency for Toxic Substances and Disease Registry, a division of the US Department of Health and Human Services, completed a health study in Anniston recently, which found that PCB exposure in the town is a public health hazard. It also suggested that eating local pork, fish and chicken has been a major source of PCB contamination. [\[5\]](#)

1970 -- The first proposal for a total ban on PCBs was made by Representative William Fitz

Ryan (D-N.Y.). But partly due to false health reassurances based on Monsanto's fraudulent IBT tests, the substance stayed on the market until the Toxic Substances Control Act of 1976. Monsanto officials responded to Ryan by saying they were "well aware of the concern" over PCBs. [\[11\]](#)

1970 --- Monsanto said steps had been taken to insure public safety, but denied knowledge of whether any PCBs had been released from its W.G. Krummrich plant in Sauget, Illinois. (Monsanto's plant in Sauget has over a dozen chemical dumps on it, according to the WALL STREET JOURNAL, several of them containing substantial quantities of PCBs, at concentrations as high as 74,000 parts per million (ppm), or 7.4 percent. For years, the Sauget plant was the nation's largest single manufacturer of PCBs. Monsanto officials insist that the PCBs on their property do not necessarily belong to them. Anyone could have dumped PCBs there, they say. All told, there are more than one million tons of chemical wastes on Monsanto's property. Monsanto insists the wastes did not necessarily come from their plant, located half a mile north of the dumps. It is company policy to destroy waste records after 4 years. Meanwhile the state of Illinois has spent 12 years and \$1.3 million trying to get the Monsanto site listed on the federal Superfund. An estimated 13 tons of chemical wastes leach off the Monsanto site into the Mississippi River each year.) [\[1\]](#)

1970s --- Scientists studying damage to wildlife from DDT realized there was something else causing problems similar to DDT, and soon they identified PCBs as the culprit. [\[1\]](#)

1970 --- Monsanto's R. E. Keller noted in an internal memo that specially prepared PCB samples sent to a lab for animal toxicity testing were free of troublesome dibenzofurans "which might bias the results." As an aside, he added they were free from dioxin contamination as well. According to attorney Paul Merrell, "The implication is that the PCBs they tested did not contain the toxic material, but that it was common in their product. It's evidence of a cover-up." Merrell is an attorney in a lawsuit challenging the informed silence of the PCB manufacturers. His client, the Nevada Power Company, has charged GE, Westinghouse, and Monsanto in federal district court with fraud and deliberate failure to warn the utility and its customers about product defects and negative health effects associated with PCBs. The companies' initial defense was to argue that the utility was aware of the dangers long before it filed its suit in 1988 and should have suspected fraud earlier, but that the statute of limitations had now passed. "Nevada Power actually knew of the product defects and of facts contrary to those represented" by the PCB manufacturers at the time of sale, argued Monsanto attorney Bruce Featherstone in 1991. "They had actual knowledge of the facts constituting a fraud." [\[11\]](#)

1970 --- Campbell's Soup Company had to slaughter 146,000 chickens after detecting high levels of PCBs in chickens raised in New York State. [\[6\]](#)

1970 --- Bob Boyle, of Sports Illustrated, published an article entitled "Poison Roams Our Seas" in which he warned of dangerously high levels of PCBs in fish. [\[6\]](#)

1970 ---- In order to maintain its position that "PCBs are not and cannot be classified as highly toxic," Monsanto engaged Industrial Bio-Test Labs of Northbrook, Illinois, to do safety studies on its Aroclor PCB products. Seven years later, IBT Labs would be at the center of one of the most far-reaching scandals in modern science, as thousands of its studies were revealed through EPA and FDA investigations to be fraudulent or grossly inadequate. One of IBT's top executives was Dr. Paul Wright, a Monsanto toxicologist who took a job at IBT Labs in part to supervise the PCB tests, and then returned to Monsanto. Wright was eventually convicted of multiple counts of fraud in one of the longest criminal trials in U. S. history -with his legal fees paid by Monsanto. While fraud on the PCB tests was not raised in the IBT trial, it is strongly

suggested by memos and letters that came to light in later civil lawsuits. Several of these show how, at Monsanto's request, IBT Labs customized its studies. "I think we are surprised (and disappointed?) at the apparent toxicity at the levels studied," Monsanto's Elmer Wheeler wrote in March 1970 to IBT president Joseph Calandra. "I doubt that there is any explanation for this but I do think that we might exchange some new thoughts." In a letter to IBT Labs two months later commenting on a set of PCB test results, Wheeler wrote, "We would hope that we might find a higher 'no effect' level with this sample as compared to the previous work." In later years, Monsanto's requests would become even more blatant. "In two instances, the previous conclusion of 'slightly tumorigenic' was changed to 'non-carcinogenic,'" Monsanto wrote in July 1975. "The latter phrase is preferable. May we request that the Aroclor 1254 report be amended to say 'does not appear to be carcinogenic.'" Two weeks later, Calandra responded: "We will amend our statement in the last paragraph on page 2 of the Aroclor 1254 report to read, 'does not appear to be carcinogenic' in place of 'slightly tumorigenic' as requested." Testimony about the IBT Labs scandal in a Texas lawsuit against Monsanto indicates that IBT was aware that PCBs caused extremely high numbers of tumors in test rats, with 82 percent developing tumors when fed Aroclor 1254 at 10 parts per million and 100 percent at 100 parts per million. Yet IBT Labs certified PCBs a noncarcinogen. [\[11\]](#) For more information, read: <http://www.rachel.org/search/index.cfm?St=1> Enter: "Toxic Deception"

1971 --- Papageorge addressed a special committee of the American National Standards Institute that was searching for ways to extend the use of PCBs. "We cannot overlook the emotions that have set in," he said, "and believe me, there are many and they are deep. As you know, the references in the popular press to hazardous poisons and birth defects, which have not been substantiated, are most difficult to overcome." [\[11\]](#)

1971 --- Fearing lawsuits, Monsanto began requiring its customers like Westinghouse to sign a waiver relieving it of financial liability for improper uses of the chemical, thus putting buyers on notice of possible dangers. [\[1\]](#)

1971 --- A group of Westinghouse staff met to discuss PCBs and they noted that PCBs concentrate in the food chain. The Dec. 28 minutes of the meeting (stamped "PROPRIETARY CLASS 1 -- DESTROY BY BURNING OR SHREDDING") acknowledged the problems of PCB accumulation in wildlife, and indicated that PCBs caused reproductive disorders in chickens and birth defects in victims of the Yusho Incident. They also acknowledged that Yusho might have involved dibenzofurans [furans], which are created when PCB oil is heated. The minutes said: "It was generally concluded that... there is sufficient evidence that pcbs can be deleterious to the health of animal and human life and that the risks of ignoring the evidence that does exist was [sic] inappropriate for Westinghouse." Yet the 1971 memo recommended continued use of PCBs. [\[22\]](#)

1971 --- A Westinghouse biochemist named Thomas O. Munson says he received instructions directly from then-chief executive officer Donald C. Burnham to study PCB contamination around four Westinghouse plants. In 1972 Munson submitted his report to Westinghouse officials, urging them to tell the local communities of the massive contamination he had found and to take remedial action. Instead Westinghouse kept the Munson report secret and continued to dump liquid PCBs directly into the local environments, Munson says. [\[9\]](#)

1971 --- Monsanto destroyed another 88,000 chickens in North Carolina because a PCB leak from a heating system had contaminated the feed. [\[6\]](#)

1972 --- Monsanto provided its customers a Q & A sheet, which reads in part: "PCB is a persistent chemical which builds up in the environment. It, therefore, should not be allowed to

escape to the environment." [5]

1972 --- The US Attorneys Office, desperate to take some kind of action to clean up the Hudson River, filed suit against Anaconda. Anaconda was found guilty of 100 counts of pollution of the Hudson river and fined \$200,000. [6]

(Go to Page Two of the History, [1973-2001](#))

References for *PCB History*

1. Peter Montague, (National Writers Union, UAW Local 1981/AFL-CIO), Rachel's Environment & Health Weekly, a publication of the Environmental Research Foundation, P.O. Box 5036, Annapolis, MD 21403. Fax (410) 263-8944; Internet: erf@rachel.org. Issues #144, #171, #295, #327, #329, #400, #554. Search engine: <http://www.rachel.org/search/index.cfm?St=1>
2. Fisher Associates Environmental Engineers Ltd., "FAQs about PCBs." Webpage: <http://www.fisherenvironmental.com/>
3. Robert Riseborough and Virginia Brodine, "More Letters in the Wind," in Sheldon Novick and Dorothy Cottrell, editors, OUR WORLD IN PERIL: AN ENVIRONMENT REVIEW (Greenwich, Conn.: Fawcett, 1971), pgs. 243-255.
4. Solutia, Inc. webpage <http://www.solutia.com>
5. Nancy Beiles, "What Monsanto Knew: Outraged by PCB Contamination, an Alabama Town Unearths a Company's Past." May 29, 2000, The Nation. <http://www.thenation.com/doc.mhtml?i=20000529&s=beiles>
6. David Lincoln, Environmental Consultant, February 19, 1999, GREENLITE HOME PAGE -- - HISTORY OF PCB POLLUTION PROBLEMS <http://hometown.aol.com/davelinc/index.html>
7. Greenpeace webpage on POPS --- <http://www.greenpeace.org/~toxics/tbg/tbg3.html>
8. C.D. Stelzer, "Buried History of Hazardous Waste in Missouri," RIVERFRONT TIMES February 14, 1996 http://home.stlnet.com/~cdstelzer/Buried_waste.html
9. Michael Schroeder, "Did Westinghouse Keep Mum on PCBs?" BUSINESS WEEK August 12, 1991, pgs. 68-70.
10. Cecil K. Drinker and others, "The Problem of Possible Systemic Effects From Certain Chlorinated Hydrocarbons," THE JOURNAL OF INDUSTRIAL HYGIENE AND TOXICOLOGY Vol. 19 (September, 1937), pgs. 283- 311.
11. Eric Francis, "Conspiracy of Silence: The story of how three corporate giants— Monsanto , GE and Westinghouse—covered their toxic trail." From Sierra magazine, cover story, Sept./Oct. 1994. <http://www.planetwaves.net/silence.html>
12. Zack, J.A., and W. R. Gaffey, "A Mortality Study Of Workers Employed At The Monsanto Company Plant In Nitro, West Virginia," ENVIRONMENTAL SCIENCE RESEARCH, Vol. 26 (1983), pgs. 575-591.
13. R.R. Suskind, and V.S. Hertzberg, "Human Health Effects Of 2,4,5-T And Its Toxic Contaminants," JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Vol. 251, No. 18 (1984), pgs. 2372-2380.
14. R.R. Suskind, "Chloracne, 'The Hallmark Of Dioxin Intoxication,'" SCANDINAVIAN JOURNAL OF WORK, ENVIRONMENT AND HEALTH, Vol. 11, No. 3 (1985), pgs. 165-171.
15. R.R. Suskind, "Long-Term Health Effects Of Exposure To 2,4,5-T And/Or Its Contaminants," CHEMOSPHERE, Vol. 12, No. 4-5 (1983), pg. 769.

16. In the United States Court of Appeals For the Seventh Circuit, No. 97-2469, Johnnie B. Taylor, et al., v. Monsanto Co., Appeal from the United States District Court for the Southern District of Indiana, Indianapolis Division. No. IP 91-626-C--Sarah Evans Barker, Chief Judge. Argued December 5, 1997--Decided August 5, 1998
<http://www.kentlaw.edu/7circuit/1998/aug/97-2469.html>
17. COPA, "Who's Who: Westinghouse Electric Corporation," webpage:
<http://www.copa.org/whoswho/westgh.htm>
18. Letter from Elmer P. Wheeler of Monsanto, to H. Wilbur Speicher of Westinghouse, October 23, 1959.
19. Soren Jensen, "Report of a New Chemical Hazard," NEW SCIENTIST Vol. 32 (1966), pg. 612.
20. Kuratsune, Nakamura, Ikeda, & Hirohata, Analysis of Deaths Seen Among Patients with Yusho-A Preliminary Report, Chemosphere, Nos. 8/9, 2085 (1987)
21. National Safety Council webpage --- Polychlorinated Biphenyls (PCB) Chemical Backgrounder <http://www.nsc.org/library/chemical/polychlo.htm>
22. Memo from G.W. Wiener, Research Director, Power Systems, Westinghouse, titled "Minutes of pcb status," dated Dec. 28, 1971.
23. Robert L. DeLong and others, "Premature Births in California Sea Lions: Association With High Organochlorine Pollutant Residue Levels," SCIENCE Vol. 181 (Sept. 21, 1973), pgs. 1168-1170.
24. "Public Interest Pretenders," CONSUMER REPORTS Vol. 59, No. 5 (1994), pgs. 316-320.
25. COPA, "Who's Who: The PCB Contamination Timeline for Monroe County, Indiana." Webpage: <http://www.copa.org/whoswho/pcbtime.htm>
26. Stuart Mierher, "Westinghouse Lawyer Urged in '88 Note That Toxic- Safety Records Be Destroyed." WALL STREET JOURNAL February 26, 1993, pg. A-4.
27. Undated "smoking gun" memo by Westinghouse attorney Jeffrey Bair and C.W. Bickerstaff, then Manager of Corporate Industrial Hygiene for Westinghouse.
28. Shinsuke Tanabe, "PCB Problems in the Future: Foresight from Current Knowledge," ENVIRONMENTAL POLLUTION Vol. 50 (1988), pgs. 5-28. Also: Cummins, J.E., "Extinction: The PCB threat to marine mammals", The Ecologist, Vol.18 No.6. 1988. Also: Reijnders. P., "Reproductive failure in common seals feeding on fish from polluted coastal waters", Nature 324. pp. 456-7, 1986. Also: Subramanian, A., Tanabe, S., Tatsukaura. R., Sairo, N. and Miyanznki, N., "Reduction in the testosterone levels by PCBs and DDE in Dalls' porpoises". Marine Pollution Bulletin, 18, pp. 643-646, 1987: and Subramanian, A., Tanabe, S., and Tarsukaaura, R., "Use of Organochlorines as chemical tracers in determining reproductive parameters in Dalls' porpoises", Marine Environment. 1988. Also: Wolkers, J., Burkow. L. Lydersen, C., Dable, St., Monshouwer, M. and Witkamp, R. "Congener specific PCB and polychlorinated camphene in Svalbard ringed seals", Sci Total Environ 216. pp. 1-11, 1998. Also: Cummins, J.E., "PCBs: Can the World's Sea Mammals Survive Them?" The Ecologist, Vol. 28, No. 5, Sept./Oct. 1998. <http://www.argonet.co.uk/users/john.rose/pcb.html>
29. Hugh A. Tilson and others, "Polychlorinated Biphenyls and the Developing Nervous System: Cross-Species Comparisons," NEUROTOXICOLOGY AND TERATOLOGY Vol. 12 (1990), pgs. 239-248.
30. Cate Jenkins, "Memo to Raymond Loehr: Newly Revealed Fraud by Monsanto in an Epidemiological Study Used by EPA to Assess Human Health Effects from Dioxins," Feb. 23, 1990. Jenkins was a chemist with the Waste Characterization Branch of EPA. Loehr was

Chairperson of the Executive Committee of the Science Advisory Board, EPA. The Jenkins memo had attached to it 25 pages of a brief filed in Case No. 5-88-0420, in the Appellate Court of Illinois.

31. Kristin Bryan Thomas and Theo Colborn, "Organochlorine Endocrine Disruptors in Human Tissue," in Theo Colborn and Coralie Clement, editors, CHEMICALLY-INDUCED ALTERATIONS IN SEXUAL AND FUNCTIONAL DEVELOPMENT: THE WILDLIFE/HUMAN CONNECTION [Advances in Modern Environmental Toxicology Vol. XXI] (Princeton, N.J.: Princeton Scientific Publishing Co., [1992].) pgs. 342-343. Also: pgs. 365-394.

32. Dewailly, E., Ayotte, P., Bruneau, S., Lalibert, C., Muir, D. and Norstrom, R., "Inuit exposure to organochlorine through the aquatic food chain in arctic Quebec", Environmental Health Perspectives, 101, pp. 618-20. 1993. Also: Dewailly, E., Ryan, J. Lalibert, C., Bruneau, S., Weber, J., Gingras, S. and Carrier, G., "Exposure of remote maritime populations to coplanar PCBs". Environmental Health Perspectives 102 Suppl. 1, pp. 205-9. 1994. Also: Ayotte, P., Dewailly, E., Bruneau, S., Careau, H. and Vezina, A., "Arctic air pollution and human health" Sci Total Environ pp.160-161. pp. 529-37, 1995. Also: Mulvad, G., Pedersen, H., Hansen, J., Dewailly, E., Jul, E., Pedersen, M., Deguchi, Y., Newman, W., Malcom, G., Tracy, R. Middasugh, J. and Bjerregaard, P., "The Inuit diet". Arctic Med. Res. 55. Suppl. 1. pp. 20-4, 1996. Also: Ayotte, P., Carrier, G. and Dewailly, E., "Health risk assessment for Inuit newborn". Chemosphere 32. pp. 531-42, 1996. Also: Ayotte, P., Dewailly, E., Ryan, J., Bruneau, S. and Lebel, G., "PCBs and dioxin-like compounds in plasma of adult Inuit Living in Nunavik". Chemosphere 34, pp. 145968, 1997. Also: Dewailly, E., Ayotte, P., Blanchet, C., Grodin, J., Bruneau, S., Holub, B. and Carrier, G. "Weighing contaminant risks and nutrient benefits of country food in Nunavik", Arctic Med. Res. 55, Suppl. 1, pp. 13-19. 1996. Also: Canadian Polar Commission Polaris Papers 10. "The Environment and Human Health In the Arctic Polaris". pp. 1-15. 1996.

33. [1] Marguerite Holloway, "Dioxin Indictment," SCIENTIFIC AMERICAN Vol. 270 (January 1994), pg. 25.

34. THE NATIONAL LAW JOURNAL, "Monsanto Hit Big For PCB Liability," March 7, 1994 pg. 17 Transwestern Pipeline Co. v. Monsanto Co., C643857 (Super. Ct., Los Angeles Co.) <http://netwizards.com/~rsowin/index%20/PCB%20Award%20.html>

35. William Sanjour, EPA Office of Solid Waste and Emergency Response, "Memorandum: The Monsanto Investigation" to David Bussard, Director, EPA Characterization and Assessment Branch, dated July 20, 1994.

36. Tryphonas, H., "Immunotoxicity of PCBs in relation to the Great Lakes." Environmental Health Perspectives. 103, Suppl. 9. pp. 35-46, 1995

37. Loomis, D., Browning, S., Schenk, A., Gregory, E. and Savitz, D., "Cancer mortality among electric utility workers exposed to polychlorinated biphenyls." Occupational Environmental Medicine. 54. pp. 720-8. 1997.

38. Russell Mokhiber, editor of Corporate Crime Reporter and Multinational Monitor.

39. Jennifer Ferrara, "Revolving Doors: Monsanto and the Regulators," THE ECOLOGIST, Sept./Oct, 1998.

40. Nuttall, N., "Pollutants blamed for dual sex polar bears," The Times, June 1, 1998.

41. Extract from The AGRIBUSINESS EXAMINER, Issue # 87 August 30, 2000 Monitoring Corporate Agribusiness From a Public Interest Perspective A.V. Krebs, Editor/Publisher

42. Katherine Bouma, "EPA alerts Anniston residents about lead," 08/08/00, The Birmingham

News.

43. World Wildlife Fund webpage:

<http://www.worldwildlife.org/toxics/progareas/pop/global.htm>.

44. International POPs Elimination Network webpage:

http://www.ipen.org/pcb_workinggroup.html

45. Dale J. Patterson, "Fox River and Green Bay PCB Fate and Transport Model Evaluation, Technical Memorandum 2d, Compilation and Estimation of Historical Discharges of Total Suspended Solids and PCB from Fox River Point Sources, Draft," Wisconsin Dept. of Natural Resources, June 3, 1998. 30 pgs & appendices