

A Developing Toxic Tort: Lumber Mills, Log Cabins, Leukemia, Lymphomas and Soft Tissue Sarcomas: The Case Against Pentachlorophenol

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and Robert Bohn, Esq.

Pentachlorophenol (also known as PCP or penta) has been conclusively established as a carcinogen in laboratory studies. PCP exposure is linked with leukemia and immune suppression after an extremely long latency period. There have been a number of PCP cases around the country and the authors are collecting interrogatory answers and depositions from a dozen PCP log cabin home cases and one case arising from the late 1960's in which a nursery of newborns was dosed with PCP via diaper detergent that killed six or seven infants. In this latter case two survivors now have leukemia.

Because there is a latency period of many years between exposure and diagnosis, health care providers, union representatives, worker's compensation attorneys and trial lawyers should inquire of anyone suffering from blood or lymph cancers about possible exposures to PCP. This is particularly true for those who have worked in the forestry, lumber mill, window manufacturing, paint, and construction industries and those who have lived in direct contact with treated wood, such as found in log cabins.

Employees of the Simpson Lumber Company, who worked on the same planning unit at the Arcata remanufacturing, or finishing, mill during the 1970's and who have subsequently suffered acute leukemias and non-Hodgkins lymphoma have filed an action against U.S. Plywood, Champion Papers, Roberts Consolidated Industries, Beecham Home Improvement Products, and DAP, Inc. Simpson's pur-



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chasing agent recently testified that the company bought Woodlife, a PCP based wood preservative, from U.S. Plywood by the truck load during this period from a formulator of the state of Washington. This company appears to be Roberts Consolidated which had a plant at Vancouver, Washington during this period.

Lumber mill workers were exposed to PCP on Simpson's paint line, where a curtain sprayer coated siding on an open conveyor belt with little ventilation. One

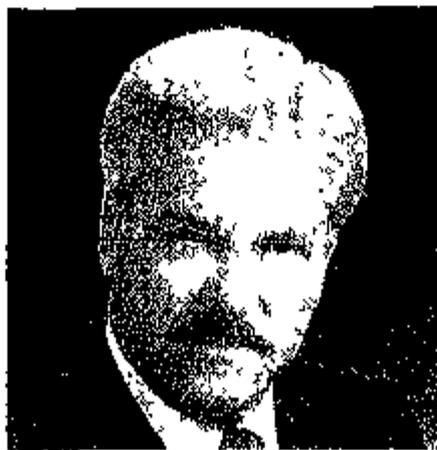
surviving leukemia victim who worked on the paint line and handled wood treated with PCP as a trim saw operator during the period 1971 through 1976 has experienced rashes, URI's, and nose bleeds. He was diagnosed as having leukemia in 1988. Co-workers have since died of non-Hodgkins lymphoma and leukemia.

The action against U.S. Plywood, Champion Papers, Roberts Consolidated Industries, Beecham Home Improvement Products, and DAP, Inc. is pending and a complete report on this particular case is premature. However, research shows that few California worker's compensation lawyers have experience dealing with toxic torts and California's plaintiffs' bar has not yet organized on these issues to develop the technical expertise to assist individual practitioners in identifying potential third party actions.

In addition, because medical care providers to victims of cancer focus on treatment, no effort is made to determine causation and exposures history by detailed systematic interviews of the patient by trained professionals, such as industrial hygienists. As a result many victims fail to receive worker's compensation benefits to which they are entitled and do not know that they are entitled to seek full compensation in a superior court lawsuit against the manufacturers and sellers of carcinogenic products.

This situation has developed despite a strong social commitment to a safe environment, an extensive logging industry and the fact that forestry workers specifically have been identified in the literature as primary victims of PCP induced carcinomas, among other occupationally exposed workers. Research also shows that the application of PCP in log cabin homes in the Midwest has been the primary legal battleground concerning this carcinogen.

For these reasons, the authors share



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their research on PCP, and that of others, with the hope that a dialogue or network of informed professionals will be created for the benefit of all clients and the general public.

PENTACHLOROPHENOL (PCP)

PCP has been used as an insecticide, fungicide and herbicide in industrial, agricultural and domestic applications, but it is primarily a wood preservative. PCP is an extremely dangerous carcinogen when it is used to preserve wood for inside applications. (*Environmental Health Criteria 71, Pentachlorophenol*, World Health Organization, Geneva, 1987, pp. 11-12.)

PCP has been used for years to preserve telephone poles, fence posts and water exposed decking. It was introduced in the 1970's to preserve finished mill work, casements, mullions and to treat perimeter wall logs in log home kits marketed to the public.

PCP is a halogenated hydrocarbon, composed of a benzene ring to which is attached a hydroxide radical making a phenol which is then chlorinated. By-product contaminants of the process include tetrachlorophenol, hexachlorobenzene and various dioxins and furans. Hexachlorodibenzodioxin, an extremely

toxic dioxin, has appeared in commercially produced PCP in the United States during the 1970's in amounts ranging up to 100 parts per million.

A purer grade of commercial PCP was developed, manufactured and sold by the Dow Chemical Company in response to concerns raised by the Environmental Protection Agency about the high level of dioxins in PCP which was being marketed in the early 1970's. The newly developed product, Dowicide E. C. - 7, contained approximately one percent of the dioxin contamination found in the technical grade of PCP used in the manufacture of Woodlife, a mineral spirit solution used by Simpson as a fungicide and originally marketed by U.S. Plywood.

TOXICITY AND CARCINOGENICITY

PCP is a known toxic chemical. It is readily absorbed by lung, skin and stomach. While there may be a difference in the biological response of rabbits and humans to 10 percent solution of PCP, the probable oral and dermal lethal doses for a 150 pound person, based on the animal toxicity literature, is 1.09 ounces orally and 4.4 ounces dermally.

The body absorbs PCP and discharges it in a number of ways. PCP is eliminated mainly through urine and the half-life of elimination by urine has been observed to be as long as 18 to 20 days. (Uhl, et al., *Pharmacokinetics of Pentachlorophenol in Man* (1986) *Arch. Toxicol.* 58:182-186.) However, although much PCP is excreted in urine, it accumulates in tissues, particularly muscle, bone marrow and fat. (Braun, et al., *The Pharmacokinetics and Metabolism of Pentachlorophenol in Rats* (1977) *Toxicol. Appl. Pharmacol.* 41:395-406.)

The "no effect" and "lethal" dose limits of PCP are not greatly different. For example, at a dose of 80 milligrams per kilogram, no experimental animals died. At a dose of 100 milligrams 83 percent died and at 110 milligrams 100 percent died. (Kohoe, et al., *Toxic Effects Upon Rabbits of Pentachlorophenol and Sodium Pentachlorophenate* (1959) *J. Ind. Hyg. Tox.* 21:160.)

A 1948 study by Dow Chemical describes a one percent solution of PCP as a primary irritant and showed that extremely low concentrations were capable of producing skin rashes and acne-like effects

and that the sodium salt of PCP caused highly allergenic responses.

Chronic toxicity associated with PCP was first reported in *California Health* in June 1970, in the case of a woman who had moved into a newly constructed home which had been treated with PCP. She experienced rapid weight loss, weakening and tightening in her chest, and symptoms which were suspected to be asthma and bronchitis. After leaving the structure her health improved.

German literature reports health problems due to residential exposure to PCP. Brandt and Schmidt, in *Chronische Lebererkrankung durch Langjahrige Intoxikation im Haushalt mit Pentachlorophenol* (1977) *Deutschen Gesellschaft fur innere Medizin*, pp. 1609-1611, reported fluctuating abnormal liver enzymes directly associated with moving into and out of a dwelling which had its interior treated with PCP. Later, Gebefugi reported health problems associated with residential interior exposure to PCP. (Gebefugi, et al., *Occurrence of Pentachlorophenol in Enclosed Environments* (1979) *Ecotoxicology and Environmental Safety* 3:269-300.)

The health effects observed in both the occupational and residential exposures, especially those related to the skin and respiratory tract, are best explained by laboratory findings involving immune system studies of laboratory animals. In a series of experiments reported in the early 1980's, it was found that technical grade PCP causes immune suppression in animals which the researchers linked to dioxins contained in PCP and found that hepta and hexa dioxin are implicated. (Kerkvliet, et al., *Humoral Immunotoxicity of Polychlorinated Diphenyl Ethers, Penoxypheols, Dioxins and Furans Present as Contaminants of Technical Grade Pentachlorophenol* (1985) *Toxicology* 36:307-324 (see extensive articles cited).)

In addition to suppressing the immune system, laboratory and epidemiological studies have shown technical grade PCP to be a carcinogen. PCP was a suspected carcinogen in 1978. (Greene, et al., *Familial and Sporadic Hodgkin's Disease Associated with Occupational Wood Exposure*, *The Lancet*, September 16, 1978, pp. 626-627; Goldstein, et al., *Effects of Pentachlorophenol on Hepatic Drug*

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Technical grade PCP contains dioxins. Dioxins have been considered carcinogens in humans since the early 1970's. (Ton That Tung, *Le Cancer Primaire Due Foie Au Viet-nam* (1973) 99:427-436; Hardell, *Soft-Tissue Sarcomas and Exposure to Phenoxy Acids: A Clinical Observation* (1977) *Lakartidningen* 74:2753-2754.)

Like technical grade PCP, phenoxy acids also contain dioxins as contaminants. Adverse health effects associated with exposure to dioxins and furans are well documented. (Schwetz, et al., *The Effect of Purified and Commercial Grade Pentachlorophenol on Rat Embryonal and Fetal Development* (1974) *Toxicology and Applied Pharmacology* 28:151-161.) Dioxins were considered carcinogens in rodents since the late 1970's. (Kociba, et al., *Results of a Two Year Chronic Toxicity and Oncogenicity Study of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin in Rats* (1978) *Toxicology and Applied Pharmacology* 46:279-303; Van Miller, et al., *Increased Incidence of Neoplasms in Rats Exposed to Low Levels of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin* (1977) *Chemosphere* 10:625; Muranyi-Kovacs, et al., *Bioassay of 2,4,5-Trichlorophenoxyacetic Acid for Carcinogenicity in Mice* (1976) *British Journal of Cancer* 33:626.)

GOVERNMENT RESPONSE

The United States Department of Agriculture's Forest Products Laboratory has vigorously opposed the use of both PCP and creosote for residential use and warned these products "should never be used inside ... for any reason." (U.S.D.A. *Forest Service Forest Products Laboratory, General Technical Report FPL-11, Protecting Log Cabins from Decay* (1977) p. 2.)

Unfortunately, vaporization of PCP cannot be inhibited by paint, varnish, or shellac when treated wood is used for an interior application. In log homes sealants are ineffective according to the EPA. (Hosenfeld, et al., *Pentachlorophenol in Log Homes: A Study of Environmental*

and Clinical Aspects, Environmental Protection Agency Contract Nos. 68-02-3938 and 68-02-4252, MRI Project Nos. 8201-A(11) and 8801-A(02), COEH Subcontract Nos. 117-7900-17 and 180-7900-9, pp. 1-195, December 11, 1986.)

As a result of efforts by environmental and consumer groups to ban PCP beginning in 1978, the product is no longer available over the counter. EPA, in response to heavy industry lobbying, suspended its efforts to classify PCP as "acutely hazardous" and in the aftermath of that action, an EPA employee, Cate Jenkins, has brought a "whistle-blower" action for being removed from her position after she advocated classification of PCP as "acutely hazardous." At last report, the FBI, EPA Inspector General, and two congressional committee investigations also are pending.

THE LOG HOME AND DIAPER LITIGATION RECORD

In July 1990, Fawna Wright received a \$3.75 million recovery as a result of being exposed to PCP, via diaper detergent, in 1968 in the nursery of the Salvation Army Hospital in St. Louis. She suffers from leukemia, first diagnosed at age 18. Wright's attorney, Robert Bogard, reports that with one exception other victims of this PCP exposure have not been notified because they were all placed for adoption and their subsequent health histories are unknown. It is indeed a public health disaster that this cohort of victims is shielded from inquiries by medical researchers under Missouri's adoption laws.

Roberts Consolidated Industries has settled the wrongful death claim of Mrs. Rita Ives, whose husband, a physician, died as a result of exposure to Woodlife while building a log cabin home for his family. Mrs. Ives, represented by James Larkin of Bloomington, Minnesota, demanded as part of the settlement of her case a personal meeting with the president of Roberts in which she clearly and unequivocally explained why the warnings on Woodlife were grossly inadequate.

In *Perkins v. Northeastern Log Homes, Inc., Roberts Consolidated Industries and DAP, Inc.*, Omaha attorneys Richard McMullin and Timothy Cuddigan, who significantly contributed to this article,

are seeking recovery for PCP exposure occurring in 1978 when Mrs. Perkins used a solution of bleach to scrub PCP stains from the interior logs of her newly constructed log home. In 1986 Mrs. Perkins was diagnosed as suffering from non-Hodgkin's lymphoma, but did not discover the connection to PCP until 1989. The action is pending.

Patricia and Gregory Johnson settled *Johnson v. Northeastern Log Homes* in which they claimed that Roberts Consolidated Industries had special reason to be aware of the adverse health effects in humans caused by residential interior exposure to PCP because its PCP-based product, Woodlife, was involved in several cases in the 1970's: *Fertig and King*. In *Fertig v. U.S. Plywood*, plaintiffs claimed adverse health effects and property damage caused by the interior use of Woodlife containing PCP. The makers of Woodlife also were sued by the Tran King family in 1976 for toxic exposure causing personal injuries and property damage.

In these cases plaintiffs argued that Northeastern Log Homes had direct knowledge of the adverse health effects of Woodlife containing PCP that caused it in late 1978 to cease the use of Woodlife for dip-treating perimeter logs. Despite knowledge of these concerns, Northeastern took no steps to affirmatively warn its

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customers about the hazards created by its use of Woodlife, even though in 1981 Dr. Vernon N. Houk, Acting Director of the Center for Environmental Health of the Center for Disease Control, specifically recommended that Northeastern inform its customers of possible health risks from PCP exposure in its log homes.

The full list of other PCP exposure cases includes claims against PCP used in wood beams in public buildings, in wood pallets and ammunition boxes, and as a pesticide for termites.

CANCER IN THE LUMBER MILL INDUSTRY

Numerous studies link occupations in the lumber and sawmill industry with acute leukemias, Hodgkin's and non-Hodgkin's lymphomas and multiple myelomas. (Milham, *Study of Mortality Experience of AFL-CIO United Brotherhood of Carpenters and Joiners of America, 1969-70* (1974) DHEW Pub. No. 74-129, Springfield, Virginia, National Technical Information Service; Jappinen, et al., *Cancer Incidence of*

Workers in Finnish Sawmill (1989) Scand. J. Work Environ. Health 15: 18-23; Morton and Marjanovic, *Leukemia Incidences By Occupation in Portland-Vancouver Metropolitan Area* (1984) Am. J. Ind. Med. 6:185-205; Burkart, *Leukemia in Hospital Patients with Occupational Exposure to Sawmill Industry* (1982) West. J. Med. 137:440-441; Erickson, et al., *Study on Malignant Mesenchymal Tumors of Soft Tissues and Exposure to Chemical Substances* (1979) *Lahartidningen* 76:3872-3875; Hardell, *Malignant Lymphoma of Histiocytic Type and Exposure to Phenoxyacetic Acids or Chlorophenols* (1979) *Lancet* i:56; Milham and Hessler, *Hodgkin's Disease in Woodworkers* (1967) *Lancet* ii:136-137.)

It is thought that exposures to chlorophenol herbicides in the lumber industry have been the principle cause for the increased risk of hematopoietic cancers. (Erickson, *supra*, 76:3872-3875; Hardell, *supra*, i:56, ii:136-137.) These factors are strongly suspected as potentially causative in the Humboldt County action in which Simpson Lumber

Company employees suffered a 16 fold increase in the number of blood cancers over statistically expected malignancies.

A 1981 study of forestry workers exposed to chlorophenols found an eight-fold increase in soft tissue sarcomas and malignant lymphomas due to herbicides containing chlorophenols, primarily PCP. (Hardell, et al., *Malignant Lymphoma and Exposure to Chemicals, Especially Organic Solvents, Chlorophenols and Phenoxy Acids: A Case-Control Study* (1981) *British Journal of Cancer* 43:169-176.)

PLAN FOR ACTION

A study by the State Department of Health of the reported cancers in Humboldt County shows a latency period from exposure to a carcinogen until the clinical detection of cancer of 14 to 17 years.

The clear significance of this long latency period is that other cases can yet be expected and vigilant health care providers, union representatives, and lawyers must always suspect the potential for chemically induced leukemias and lymphomas in woodworking, lumber and forestry workers.

With cancer taking a devastating social and economic toll, government funding for the placement of industrial hygienists in every significant cancer care center to take detailed histories of potential exposures should be a top health care priority in order to identify industrial practices and products for which further study and precautions are necessary.

The authors would appreciate any information concerning an action filed in Sacramento in the early 1980's arising from the exposure to PCP treated ammunition boxes by employees of a floral company.

We publicly thank Rita Ives and Patricia Johnson for their assistance and support and the good offices of attorneys James Larkin, Robert Bogard, Timothy Cuddigan and Richard McMillan who kindly have shared their work with us.

Those interested in forming a partnership to provide continuing education, networking, and to share resources concerning PCP and other toxic chemicals are invited to write Richard Alexander and Robert Bohn, P.O. Box 1330, San Jose, CA 95109-1330. ■

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