



THE INDUSTRIAL
COMMISSION OF OHIO

Richard F. Celeste
Governor

One Government Center
Suite 1173
Jackson and Erie Streets
Toledo, Ohio 43604
August 24, 1988

PLAINTIFF'S EXHIBIT

BEA-102

Legal Section
Industrial Commission of Ohio
246 North High Street
Columbus, Ohio 43215

RE: OD 193055
Nathaniel Harwell
Koppers Co.
Toledo, Ohio

Attn: Judy Spencer

Dear Ms. Spencer:

The Toledo Coke Company's Safety Director, Jacque Brown was contacted by phone on August 3, 1988. The Koppers Company, Toledo was sold and became the Toledo Coke Company. The claimant was also interviewed by phone. I toured Koppers during previous investigations.

The claimant is diagnosed as having emphysema by Dr. David K. Sheer M.D.

HEALTH HISTORY

The claimant smoked cigarettes from 24 to 34 years. The investigation report states, "I (claimant) stopped smoking cigarettes in 1977 and have not had one since then. Four paragraphs later the claimant says, "In February, 1986, Dr. Sheer told me I had emphysema. He told me I had to get off the cigarettes, and put me on a medication." This is the reason for the smoking history range.

WORK HISTORY

The claimants work history is from the facsimile file and his interview.
1956 - 1970 Local 500 Laborers Union - General laborer for concrete contractors. He did not mix dry ingredients. The work was sporadic.

1970 - 1978 Interlake Iron - This pig iron smelter was sole user of the coke now produced by Toledo Coke Company. The claimant poured liquid iron from ladles into pig molds. He did not work at the furnaces or coking operations.

1978 - 1987 - Koppers Co. - This company retained the Interlake coking operation. The claimant filled the coke ovens with coal, from openings in the top. This job is called lidman.

EXPOSURE POTENTIALS

Concrete Work

Exposure to unknown concentrations and duration to concrete dust and Portland cement is probable. Both are considered nuisance type dusts. After 20 years exposure to Portland cement 195 of 2278 workers involved in the manufacture of Portland cement showed lung markings on x-ray films. There were no symptoms referable to the chest. Cement plant workers with five years of exposure showed symptoms including wheezing and chronic bronchitis.¹

Lung tissue reaction to nuisance dusts do not change the architecture; air spaces remain intact. Scar tissue is not formed to any significant degree and tissue reaction is potentially reversible.²

Iron smelting

The iron oxide fume generated in the pouring operation can cause a benign pneumoconiosis called siderosis. X-ray changes are observed after 6 to 10 years but lung function changes do not occur.³

Coke Operations

Coke is the carbonaceous residue of destructive distillation of bituminous coal. At Toledo Coke (Koppers) there are 51 ovens, each 8 feet high, 20 - 40 inches wide and 25 - 30 feet deep. The coal is loaded, through lids, from the top by lidmen. The coke is ejected from the ovens by a hydraulic ram moving through the oven fan side to side. The coke is poured into railroad cars and sprayed with water to cool it.

As a lidman, the claimant said he was supplied with either a tank type air purifying respirator or a cloth type mask. He said the respirator was very restrictive and he opted for the mask frequently. The mask and respirator type were unavailable from Mr. Brown.

The claimant said that personal air samples were obtained on him and fellow workers. The sample results were never revealed to him.

An Industrial Commission claim OD 189927 dated May 26, 1987 may provide some insight into lidman exposures to coke oven emissions (COE) at Koppers. There are no Koppers environmental exposure results from COE as provided by Mr. Brown.

Time Period	Exposure Ranges - BSFTPM
3rd Quarter 1981	0.04 - 0.86 milligrams per cubic meter of air mg/m^3
4th Quarter 1981	0.56 - 0.84 mg/m^3

OSHA's 29 CFR 1910.1029 (Coke Oven Emissions) defines COE as the benzene - soluble fraction of the total particulate matter (BSFTPM).

In addition, a four year study of coke oven emissions and employee exposure levels showed that the lidmen were among the lightest exposed workers. The BSFTPM mean exposure was 0.38 mg/m^3 . A section on Coal Tar Emissions in the Encyclopedia of Occupational Health and Safety 1983, published by the International Labor Organization reinforces this premise.

HEALTH EFFECTS COE

Coke oven emissions are a complex mixture of particulates, vapors and gases which include numerous polynuclear aromatic hydrocarbons (PAH) many of which are carcinogenic. High respiratory mortality, among coke workers in Great Britain, is reported. Kidney and lung cancer was relatively prevalent among American coke oven workers exposed 5 years or more. Animal studies indicate lung and kidney tumors by coal tar aerosols. When aerosol concentrations are maintained below 0.2 mg/m^3 , any increase in the incidence of lung and other tumors, due to occupational exposure should be minimal.⁵

The PAHs include, but are not limited to, Benz(a) anthracene, chrysene, pyrene and benzo(a) pyrene; all which are carcinogenic. There are many other PAHs which do not cause cancer including fluoranthene, naphthacene and pentaphene.

PAHs can be found almost everywhere; in the air, soil and water. The trace amounts result from forest fires and volcanoes. PAHs occur in tobacco smoke and grilled, smoked and fried foods. The primary exposure to humans is the industrial sources of coal tars and coke oven emissions.⁶

Chemical Hazards of the Workplace by Proctor and Hughes notes that mortality from lung cancer for lidmen is 2.5 times the expected rate. These figures are for five or more years as a lidman. As employment length increases so does mortality. Twenty years experience shows a lung cancer rate twenty times the normal rate.

Discussion

The definitions of emphysema and chronic bronchitis are presented to differentiate them from lung cancer. Emphysema is characterized by abnormal, permanent enlargement of airspaces distal to terminal bronchitis, accompanied by destruction of their walls. Radiographic features, together with increased lung volumes (total lung capacity being the crucial measurement; whereas increased vital capacity may provide the clue on screening exams are currently utilized as acceptable criteria with which to distinguish the emphysema component in subjects with "chronic obstructive airways disease. "But, the combined use of historical, physiological and radiographic criteria permit recognition and diagnosis of chronic bronchitis, emphysema alone or both.

Chronic bronchitis is a recurrent cough which occurs without localized bronchopulmonary disease. Phlegm or sputum is also present for at least three months of two sequential years. It's clinical definition adds a third qualifying criterion; dyspnea and/or airways obstruction.

Smoking

Cigarette smoking is the major cause of emphysema.⁸

Conclusion

Coke oven emissions⁹ are a causative agent in chronic bronchitis, not emphysema. PAHs are primarily carcinogens. The claimant's exposure to unknown concentrations and duration of COEs at Koppers is reasonable. A cause and effect relation to COE exposures at Koppers and the claimants' diagnosis is suspect.

Respectfully,

Richard Wilder

Richard Wilder
Industrial Hygienist

RW/dr

1. Chemical Hazards of the Workplace Proctor & Hughes 1978 Portland Cement.
2. Threshold Limit Values 1988 American Conference of Governmental Industrial Hygienists - Nuisance Particulates Pg. 7.
3. Pattys Industrial Hygiene & Toxicology 1981 Clayton Iron oxide.
4. Occupational Exposure to Coke Oven Emissions from 1978 - 83 D Keimig PhD. Archives of Environmental Health V41 No. 6.
5. TLVs 1988 ACGIH Coal Tar Pitch Volatiles.
6. Encyclopedia of Occupational Health and Safety 1983 International Labour Organization Coal Tar Emissions.
7. Occupational Respiratory Diseases 1986 NIOSH Pg. 503 Chronic Bronchitis and Emphysema.
8. Cigarette Smoking - American Lung Association 6 - 85 #0171.
9. Occupational Respiratory Diseases - National Institute of Safety and Health 1986 Pg. 504 86 - 102.