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L.J. Doemeny, Chairman
D.B. Walters, Secretary

● MONDAY MORNING - SECTION A - SYMPOSIUM ON OSHA COTTON DUST STANDARD - STANDARDS - A. Berlt, Jr., Presiding

1. OSHA COTTON DUST STANDARD. J. P. Mertonik, Jr. U.S. Dept. of Labor, 200 Constitution Ave. N.W., Washington, D. C. 20210.

After many years of debate, the Occupational Safety and Health Administration issued a final standard to control work place exposure to cotton dust on June 23, 1978. Due to legal challenges, the effective date was postponed to March 27, 1980. Cotton dust causes byssinosis, or brown lung, a disabling respiratory disease which afflicts an estimated 35,000 former and present textile workers. OSHA set a limit on the amount of airborne cotton dust permitted in the workplace air, which represents what the agency felt was the best protection todays technology can offer without a ruinous economic effect on the cotton industry. Because this limit does not totally protect the worker against the disease, the standard contains other provisions as follows: a medical surveillance to include a free examination, under the supervision of a licensed physician; a monitoring of the workplace cotton dust levels; an employee education and training program; a respirator program with medical removal protection for workers who cannot wear respirators; and a work practice program to minimize cotton dust exposures.

2. THE DEVELOPMENT OF THE OSHA COTTON DUST STANDARD. J. R. Froines, NIOSH, Parklawn Bldg., R 8-05, 5600 Fishers Lane, Rockville, MD 20857

In setting occupational health standards, OSHA is required by the OSH Act to "set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity .... for the period of his working life." This paper will discuss the promulgation of the cotton dust standard with particular reference to: 1) material impairment of health, 2) feasibility, and 3) cost effectiveness. In addition, we will address the U.S. Court of Appeals and the upcoming Supreme Court decisions on cotton dust. The Respirator, environmental and medical monitoring provisions, as well as more recent scientific research will also be updated.

3. THE TEXTILE INDUSTRY AND THE OSHA STANDARD. J. G. Tritsch. American Textile Mfrs. Institute, Inc. 1101 Connecticut Ave., N.W. Suite 300, Washington, D.C. 20036.

The American Textile Industry involvement with cotton dust as a workplace hazard began over ten years ago with industry studies to determine whether the industry had such an illness problem. Then followed major dust removal and ventilation efforts. The industry developed a work practices and medical surveillance program which was presented to OSHA. The Labor Department conducted lengthy hearings on numerous standard proposals for controlling cotton dust exposures resulting in the 1978 promulgation of the present OSHA standard. Industry doubts about need for that standard, its feasibility and its capability of solving the dust illness problem coupled with disagreement with claimed cotton dust illness dimensions led to challenge in the courts. Industry belief in ability of medical surveillance and administrative practices in support to reduce greatly or just about eliminate future byssinosis cases. Problems exist with diagnosis of cotton dust illness which complicate compensation awards. Industry supports compensation for occupational illness but not for non-occupational factors. Causative agent arrives at the mill in the bale of cotton and industry supports agressive research efforts to identify cause and seek its removal.

activities. Resources necessary to implement such a course in a variety of chemistry programs are also described.

This course is one option by which chemical health and safety education may be introduced into chemistry and chemical engineering curricula. The utility and applicability of this course will be compared to and constrasted with other laboratory chemical safety and health programs (or courses) developed for students of chemistry and related disciplines, teaching assistants, and university chemistry research personnel.

44. PROJECT TEACH SAFETY ON TV. David H. Brooks and Thomas J. Tipton, Department of Chemistry, University of Nebraska-Lincoln, Lincoln, NE. 68588

In 1975 a group of chemical educators developed Project TEACH, materials for training chemistry teaching assistants in pedagogy. An additional module devoted entirely to safety was published in 1980. This module includes a videotape, slides, and written materials, and can be used for as much as five hours of instruction. The materials are to be used in conjunction with the ACS publication, *Safety in Academic Chemistry Laboratories*. An instructor's package includes additional safety reference materials. The videotape begins with a vignette depicting the aftermath of an accident. TAs readily enter into discussions about responsibility for safety after viewing this three-minute segment. The main portion of the tape provides the rudimentary safety information that serves as a basis for the instruction of safety in teaching laboratories. The tape has been used with a wide variety of audiences, from TAs to new hires in industrial settings. The module is a beginning rather than an end to a complete safety training program.

45. A METHOD FOR ASSESSING HAZARDS IN ACADEMIC LABORATORY EXPERIMENTS. R. Watkins, E. Hudson, R. Beyer. Carroll College, 100 North East Avenue, Waukesha, Wisconsin 53186

Laboratory work, by its very nature, has certain risks associated with it. Specific hazards include inhalation of and skin contact with toxic and corrosive materials and the flammability and reactivity of certain chemicals. Instructors in chemistry courses, however, have a responsibility to recognize, evaluate, and minimize those risks. The level of hazard depends upon the nature and amount of reagents to be used, the operations to be performed, the number of students per laboratory section, and the available ventilation. Any assessment should be based upon objective criteria rather than the subjective judgments of individual instructors. Those objective criteria should be data-based and should be flexible enough to consider the uniqueness of each experiment and each laboratory situation. Our department has developed and is currently using a hazard evaluation form to assess the level of risk in each experiment. That form incorporates many of the factors mentioned above and allows for a consideration of how each individual hazard can be managed in the laboratory.

● WEDNESDAY AFTERNOON - SECTION A - SYMPOSIUM ON NIOSH EPIDEMIOLOGIC STUDIES - B.P. Brown, Presiding

46. This investigation was undertaken as a result of animal experiments that indicated that PCE was a carcinogen and due to the large number of workers potentially exposed to the chemical. The study was designed as a retrospective cohort mortality analysis using the NIOSH life table program to compare the cause-specific observed deaths with those expected based on U.S. mortality rates, age, race and calendar time specific.

The cohort was identified from records of four local labor unions representing dry cleaner workers and eligible study members had to be employed for at least 1 year before 1960 in dry cleaning shops where the primary solvent was PCE and who had no previous occupational exposure to carbon tetrachloride or trichloroethylene. There were 1,387 eligible study members -- 1,038 were known to be alive as of the closing date of 9/30/77. 285 were known dead, and 254 were of unknown vital status. Since race was not known for all cohort members a point estimate was used in calculating the SMR's (Obs./Exp. deaths).

Conclusions regarding increased risk of death from specific causes are limited by the relatively small numbers in the cohort. Based on the study results, cancer of

the colon which accounted for 11 observed deaths appears to be the cause most likely to have resulted from occupational exposure in this cohort. At the same time, particular attention should be paid to other causes of death where conclusions were limited by small numbers of observed deaths or different results for white and black rates. These additional causes include: cancer of the rectum, cancer of the pancreas, cancer of the urinary tract, cancer of the respiratory system, diseases of the blood and blood-forming organs and diseases of the genitourinary system.

47. LEUKEMIA IN PERSONS OCCUPATIONALLY EXPOSED TO BENZENE (BENZOL) By BA RINSKY, NIOSH, CINCINNATI, OH, 45226; R YOUNG, OSHA, CINCINNATI, OH 45202

A preliminary report performed by the National Institute for Occupational Safety and Health (NIOSH) on a group of persons occupationally exposed to benzene appeared in the scientific literature in July of 1977. That report concluded a statistically significant increase in mortality due to leukemia, based upon a retrospective cohort mortality study, with vital status ascertainment on only 75% of the 748 person cohort. This updated report of the same cohort is based on 98% follow-up. In addition, a scenario of the probable levels of exposures experienced by the workforce as a whole, and by the leukemia cases in particular has been reconstructed.

In light of the recent United States Supreme Court decision to overrule the Occupational Safety and Health Administration's (OSHA) standard for allowable exposure to benzene in the workplace, this new analysis should be of special interest. It was this original study by NIOSH in 1977 that largely influenced OSHA in their decision for the promulgation of the 1 ppm standard.

48. CROSS-SECTIONAL MEDICAL SURVEY OF A GROUP OF WORKERS OCCUPATIONALLY EXPOSED TO POLYCHLORINATED BIPHENYLS (PBC's) AT AN ELECTRICAL EQUIPMENT MANUFACTURING PLANT By AB SMITH, LK LOWRY, AW SMALLWOOD, RN LIGO, S TANAKA, W STRINGER, M JONES (ALL NIOSH CINTI., OH); CJ GLUECK (LIPID RESEARCH CTR., UNIV OF CINCINNATI, Cincinnati, OH 45267)

A cross-sectional medical survey was conducted of 220 active employees of an electrical equipment manufacturing company exposed to various levels of 42 percent polychlorinated biphenyl (PCB). Serum PCB levels were quantitated as Aroclor 1242 or Aroclor 1254. Mean serum Aroclor 1242 levels ranged from approximately 6 to 29 times the level among workers not exposed to PCB's at two utility companies in other communities. Mean serum Aroclor 1254 levels ranged from approximately 3 to 7 times the level among workers not exposed to PCB's at the two utility companies. Both serum PCB components increased with age, sex (males greater than females), and time assigned to the work areas of greatest PCB exposure. Despite the markedly elevated serum PCB levels among plant employees, no definite evidence was noted of clinically apparent illness. However, significant positive correlations were observed of SGOT, SGTP, plasma total cholesterol, and plasma triglycerides, with serum Aroclor 1254 level; and a significant negative correlation was observed of plasma triglycerides with serum Aroclor 1242 level. The data demonstrate that serum PCB may produce demonstrable changes in serum liver enzymes and plasma lipids in the absence of clinically detectable illness.

49. PRELIMINARY RESULTS AND COMPARISON OF JAPANESE, FINNISH, AND UNITED STATES CARBON DISULFIDE MICROANEURYSM STUDIES. Sanford Leffingwell, Donald Marsh, Bruce Albright, & Shin Lee. Shipyard Branch Clinic, US Naval Base, Charleston, SC 29408, & Division of Surveillance, Hazard Evaluation and Field Studies, National Institute for Occupational Safety and Health (NIOSH), 4676 Columbia Parkway, Cincinnati, OH 45226.

Retinal microaneurysms have been found in CS_2 - exposed workers in Japan and Yugoslavia, but not in Finland. NIOSH included evaluation of retinal hemorrhages and microaneurysms in a cross-sectional medical and industrial hygiene survey of workers exposed to low levels (generally, under 20 ppm) of CS_2 at a rayon staple plant. Retinal photographs using monochromatic light were made of each eye of 154 exposed workers and 233 control subjects. Preliminary analyses suggest that both hemorrhage and aneurysms are increased in the exposed group, but that the relationship between exposure and aneurysms is stronger than that with hemorrhage.