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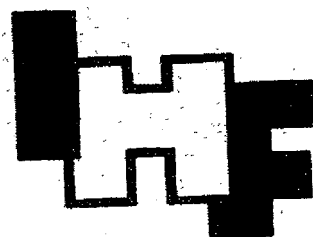
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February 1979  
Volume 43, No. 2

# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

•  
ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS



INDUSTRIAL HEALTH FOUNDATION, INC.  
5231 CENTRE AVENUE  
PITTSBURGH, PA. 15232

# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.  
Abstractor: Jean L. Collins, B.A.

February 1979  
Volume 43, No. 2

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INDUSTRIAL DUSTS AND INHALANTS

- 166/79 Asbestos Cement Dust Inhalation by Hamsters. A. P. Wehner, et al.  
Environ. Res. 17: 367-389, December 1978. 20 refs.

Two groups of 96 male Syrian golden hamsters were exposed to respirable asbestos cement aerosol at concentrations of  $\sim 1$  and  $\sim 10$   $\mu\text{g}/\text{liter}$ , respectively, 3 hours/day, 5 days/week. Average fiber counts ranged from 5 to about 120 fibers/ $\text{cm}^3$ . Each group was randomly divided into six subgroups of 16 animals. The first subgroup was sacrificed after 3 months of exposure, the second after 6 months, and the third after 15 months. The fourth subgroup was withdrawn from exposure after 3 months, observed for an additional 3 months, and then sacrificed. The fifth and sixth subgroups were withdrawn after 3 and 6 months of exposure, respectively, and maintained for observation up to the 15-month exposure point of the third subgroup at which time all surviving animals were sacrificed. All other experimental procedures were similar to those delineated in a previous publication describing the development of an animal model, techniques, and an exposure system for asbestos cement dust inhalation (A. P. Wehner, G. E. Dagle, and W. C. Cannon, 1978, Environ. Res. 16, 393-407). The asbestos cement exposure had no significant effect on body weight and mortality of the animals. Higher aerosol concentration and longer exposure times increased the number of macrophages and ferruginous bodies found in the lungs of the exposed animals. Recovery periods had no effect on the incidence of macrophages and ferruginous bodies. The incidence of very slight to slight fibrosis in the animals sacrificed after 15 months of exposure shows a significant ( $P < 0.01$ ) trend when the untreated control group and the 1 and 10  $\mu\text{g}/\text{liter}$  dose level groups are compared, indicating a dose-response relationship. Development of minimal fibrosis continued in animals withdrawn from exposure. No primary carcinomas of the lung and respiratory tract and no mesotheliomas were found.

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- 167/79 Mesothelioma After Crocidolite Exposure During Gas Mask Manufacture. A. D. McDonald and J. C. McDonald.  
Environ. Res. 17: 340-346, December 1978. 11 refs.

Of 199 persons employed in the manufacture and handling of Canadian military gas mask canisters containing pure crocidolite, 1939 to 1942, by the end of 1975, 56 had died, 120 were still alive, and 23 could not be traced. Nine (16%) of the deaths were probably due to malignant mesothelioma, six involving the peritoneum. The risk of mesothelioma after crocidolite exposure appears to be many times greater than that after chrysotile.

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- 168/79 TruCut<sup>R</sup> Needle Biopsy in Asbestosis and Silicosis: Correlation of Histological Changes with Radiographic Changes and Pulmonary Function in 41 Patients. P. Tukiainen, et al.  
Brit. J. Ind. Med. 35: 292-304, November 1978. 24 refs.

A percutaneous needle biopsy was performed with a TruCut<sup>R</sup> needle on 41 patients with suspected pneumoconiosis. Patients selected for biopsy tended to have brief or unusual dust exposure, as well as questionable radiographic opacities. Sixteen had been exposed to asbestos, 13 to silica and 12 to mixed dust containing quartz, coal, iron, asbestos and talc. All patients in the asbestos group and most in the other two groups had reduced transfer factor. Most patients in the asbestos group and about 25% of the other patients had restrictive ventilatory impairment.

Chest radiographs were assessed according to standard films of the ILO U/C International Classification (International Labour Office, 1972). In 25 patients radiographic opacities were absent or scanty (categories 0-1/1). The dominant radiographic feature of many patients exposed to asbestos was a ground-glass appearance or a bilateral elevation of the diaphragm, or both, features difficult to assess according to the ILO U/C scheme. Most histological changes were those usually seen in pneumoconiosis. However, in only two patients with silicosis were silicotic nodules detected. The specimens of seven patients showed a granulomatous inflammation. The severity of alveolar wall involvement correlated well with the transfer factor value but poorly with radiographic changes. The profusion of radiographic opacities also correlated poorly with functional impairment. As a diagnostic tool the needle biopsy was valuable in asbestosis and slightly less so in mixed-dust fibrosis. The biopsy specimens showed changes compatible with asbestosis in 75% of the suspected cases and in 86% of those in which asbestosis was the final diagnosis. In the mixed-dust group pneumoconiosis was confirmed in 67% and 80%, respectively. In the diagnosis of silicosis an open biopsy is probably more reliable than a percutaneous one, particularly if radiographic changes are minimal. Histological changes in the needle biopsy specimen were compatible with silicosis in only 36% of the suspected cases and in 63% of those in which the final diagnosis was silicosis.

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- 169/79 Experimental Silicosis Induced by Extra-Pure Crystalline Silicon Dust and the Effect of Polyvinyl-Pyridine-N-Oxide on Its Evolution. Yu. N. Golodnikov. Gig. Trud. Prof. Zabol. (12): 31-36, 1978. 13 refs. (Russian).

The effect of extra-pure crystalline silicon dust on the lungs in an experiment, and the possibility of treating pneumoconiosis provoked by this dust with polyvinyl-pyridine-N-oxide were studied. In the experiment, a total of 96 animals divided into series were used. The intensity of pneumosclerosis development was evaluated by determining the oxyproline-containing proteins, and the lung preparations were subjected to a pathohistological examination. On the whole, the pathogenic action of this dust is distinguished by a slower rate in the development of coarse silicotic nodules than occurs under the effect of quartz dust.

--Author's summary in English

- 170/79 Olivine Sand Appears to be a Winner. Penn State's Small Industries Research Program. Smaller Manufacturer 34: 12-14, January 1979.

A new molding sand for metal casting, up to five times as expensive as the traditional silica sand, may save money for foundries and help them stay in business. If that seems contradictory, it is. But three Penn State faculty members and management and workers at the Spring City Foundry, PA, are quick to point out the advantages of olivine sand for molds. And an initial large expenditure makes a lot of sense if fewer molding additives, better casting quality, less metal scrap, less make-up sand to buy, and less silica dust in the air are the advantages.

--Condensed from text

- 171/79 Evaluation of a Fluorescent Dust Tracer Technique in Cotton Ginning. R. M. Bethea, et al. Am. Ind. Hyg. Assn. J. 39: 998-1008, December 1978. 18 refs.

A technique employing a fluorescent tracer for following the break-up and dispersion of cotton trash has been developed. Senescent cotton leaves were treated with a fluorescent dye, pulverized to match the same particle size distribution as naturally occurring leaf in raw seed cotton and uniformly incorporated into the seed cotton mass prior to processing in a saw-type micro-gin. A control lot was similarly processed, excluding any dye. Airborne samples collected from the major fugitive dust emission points by standard techniques, macro trash.

- 178/79 Preventing Immersion Hypothermia. Anonymous. Brit. Med. J. 2: 1662-1663, December 16, 1978.

About 25,000 people are working in the North Sea in oil and gas production, and perhaps another 5,000 or 10,000 on merchant and fishing vessels. An unknown number of these people suffer each year from accidental immersion and a few die of hypothermia. If we are to prevent such deaths, the ideal of transferring survivors to a dry, covered life raft demands solutions to many problems -- including the stability and flotation of the helicopters; where to place the rafts (possibly on the outside of the machine); and training crews in methods of escaping from a stricken helicopter and in the techniques of self-preservation. Immersion suits are certainly important, but in the past they have been considered an easy solution -- distracting attention from the wider and more important aspects of preventing immersion hypothermia and drowning.

—Condensed from text

### ENVIRONMENTAL PROBLEMS

- 179/79 Monitored Asbestos Concentrations in Connecticut. L. Bruckman and R. A. Rubino. J. Air Poll. Control Assn. 28: 1221-1226, December 1978. 20 refs.

An air asbestos survey was conducted between late 1974 and early 1977 to define the magnitude of the health hazard posed by airborne asbestos fibers in Connecticut prior to the promulgation of the State's proposed asbestos air quality standard (i.e., 30 ng/m<sup>3</sup> or 30,000 total asbestos fibers/m<sup>3</sup>, 30-day average). A newly developed low volume particulate sampler, which operates continuously for 30 days at an air sampling flow rate of 4 cfm, equipped with special membrane filters was used to collect ambient TSP samples for subsequent chrysotile asbestos electron microscopic determination by the Battelle-Columbus Laboratories and Walter C. McCrone Associates. Approximately 40 monitoring sites were selected; ambient locations included "typical" urban sites removed from known stationary sources of asbestos emissions, rural-background sites, stations contiguous to 4 industrial users of asbestos (i.e., manufacturers of friction products, insulated wire and cable, ammunition and molding compounds), 3 toll plazas situated at various points along Interstate 95 and indoors at a swimming pool at the University of Connecticut (the ceiling over the pool was sprayed with an asbestos-containing insulating material). Ambient chrysotile asbestos levels removed from asbestos emission sources in both urban and rural locations were below 10 ng/m<sup>3</sup>. However, asbestos concentrations above 30 ng/m<sup>3</sup> were measured near each of the industrial users of asbestos. Furthermore, asbestos levels adjacent to the toll plazas were also elevated (in the 10 ng/m<sup>3</sup> to 25 ng/m<sup>3</sup> range), implicating asbestos emissions from vehicle braking lining decomposition as a significant source of airborne asbestos fibers. Indoor air asbestos levels were below 1 ng/m<sup>3</sup> suggesting that the risk to public health associated with the deterioration of asbestos surface coatings applied indoors may not be as severe as previously thought.

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- 180/79 Variable-Cut Particle-Size Classification by Opposing Jets. R. E. Pavlik and K. Willeke. Am. Ind. Hyg. Assn. J. 39: 952-957, December 1978. 17 refs.

A new technique of aerodynamic particle-size classification has been developed utilizing axisymmetrically-opposed air jets. For a fixed geometry the cut size can be varied from 0.8 to 3.6 μm by changing the jet flow rates. Future designs are expected to extend the useful particle-size range. Particles remain airborne after size separation, permitting the use of continuous, automated methods for analyzing the particle concentration and chemical composition.

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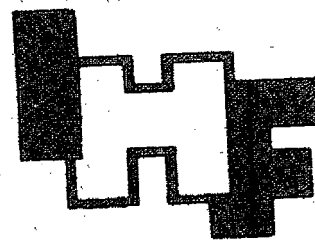
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CHANGING CONCEPTS OF  
OCCUPATIONAL MEDICINE

For Program — See Center Pages



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company doctors, Bingham suggested that employers make the workplace safe by reducing or eliminating dangerous exposures and not by excluding certain workers. Blum explained to Bingham, "We share your concern about sex-biased distinctions in regulatory decisions. In some cases, however, such distinctions are justifiable. In the case of Ferriamicide, the decision to prohibit females of childbearing age was based on test data showing that mirex, the principal ingredient in Ferriamicide, caused adverse effects in the offspring of treated animals. EPA toxicologists interpreted this data as indicating that pregnant women who are exposed to Ferriamicide may have abnormal children." In fact, we tried to find a way to provide protection for pregnant women, which would not affect nonpregnant women employment. The obvious ways, such as excluding those either permanently or temporarily sterile, would result in impossible legal and administrative problems."

203/79x EPA Reports on Lead Absorption by Children. Job Safety & Health Report 9: 28, February 13, 1979.

Young children absorb and retain a larger portion of inhaled and dietary lead than do adults, according to a recent report issued by the Environmental Protection Agency. The study was conducted for EPA by the Institute of Medical Research and Occupational Health in Zagreb, Yugoslavia, which studied families living near a lead smelter, including those whose fathers were exposed to lead on the job. The Institute found that children with fathers who were occupationally exposed to lead had slightly higher exposure levels than children whose fathers did not work with lead. In all cases, children absorbed more lead than their mothers. There were also indications that simultaneous exposure to other metals could have a moderating effect on increased lead absorption, a possibility being considered in an on-going study sponsored by EPA. Copies of Study of Children's Blood-Lead Levels Within Families are available as EPA Report No. 600/1-78-067 from Library, Mail Drop 31, Environmental Research Center, Research Triangle Park, N.C. 27514.

204/79x Detailed Description of 70 Mesothelioma Cases Provided in South Africa.  
Occup. Health & Safety Letter 9: 3-4, February 22, 1979.

Perhaps the clearest and most detailed information on symptoms and history of a mesothelioma series has come from Drs. J. C. Cochrane and I. Webster of the National Research Institute for Occupational Diseases of the South African Medical Research Council, Johannesburg. The detailed nature of the data is derived from the fortunate experience of being able to interview all 70 patients, who had been referred to the Institute by thoracic surgeons of Johannesburg and the Johannesburg General Hospital. Dr. Irving J. Selikoff of Mt. Sinai Medical Center, New York, told Occupational Health & Safety Letter that the South African study "may be the most far-reaching investigation of its kind ever conducted on asbestos exposure and mesothelioma. It goes far beyond anything we have done, much of it attributed to the investigators' ability to interview the patients and get detailed information." In only one of the 70 cases was a history of significant exposure to asbestos not found, even though the patients came from diverse occupations. This led Drs. Cochrane and Webster to observe: "An occupational and environmental history must be taken by a knowledgeable person before it is possible to conclude that there has been no asbestos exposure." Of the 69 patients with asbestos exposure, 11 worked in asbestos mining, 13 were in the asbestos-cement industry, 16 in locomotive workshops, five were asbestos transport workers and one was a medical officer at an asbestos mine. In addition, 13 had no occupational exposure to asbestos but lived on or near asbestos mines in the Northern Cape. For the latter category, a minimum of three years' residence was required in a mining area, on mine property (where floating fiber was more or less constantly in the air) or in a town where the subject had played in the grounds of an asbestos mill or on dumps of an asbestos mill or on dumps of asbestos tailings during childhood. The authors, who described their study in the South African Medical Journal last August 12, said of their

obtained that the local blood perfusion and the amount body fat were involved to a certain extent. For this reason  $C_v$  proved a somewhat less satisfactory individual dose-parameter. --Authors' summary

- 264/79 Letter to the Editor: Hydrazine. F. J. C. Roe. *Ann. Occup. Hyg.* 21: 323-326, December 1978. 12 refs.

In a Letter to the Editor, the preliminary results of an epidemiological survey being conducted by a British company which manufactured hydrazine are given. The results thus far do not indicate any greatly increased risk of cancer. The studies are being continued. --JFB

- 265/79 Neurophysiological Effects of Long-Term Exposure to a Mixture of Organic Solvents. A. M. Seppalainen, et al. *Scand. J. Work Environ. Health* 4: 304-314, December 1978. 48 refs.

Neurophysiological effects of long-term exposure to a mixture of organic solvents was studied among 102 car painters from 27 car repair garages in Helsinki. The reference group consisted of 102 age-matched railroad engineers from the Finnish State Railways. The mean age was 35 years and the exposure time ranged from 1 to 40 years (mean 14.8, SD 8.5). According to measurements the mean concentration of the solvent mixture was relatively low in the garages, namely, 31.8% of the Finnish threshold limit value (TLV), the range of separate components varying from 4 to 212% of the respective TLVs. The main components of about 20 organic solvents of the mixture were toluene, xylene, butyl acetate and white spirit. Electroencephalograms (EEGs) of all the 102 exposed and 102 nonexposed subjects were studied, but electroneuromyographic measurements were made of only 59 car painters and 53 referents with a similar age distribution. Motor (MCV and CVSP) and sensory conduction (SCV) velocities, as well as motor distal latencies, were recorded from nerves in the upper and lower extremities. Abnormal EEGs were encountered in 32 car painters and 37 referents. The frequency of abnormal EEGs was in both groups higher than expected on the basis of EEG literature (about 10%). Twenty-six car painters had a complex of four common symptoms of disturbances in the central nervous system; the same symptom complex was found in 17 engineers. Forty-six percent of the car painters with this symptom complex had an abnormal EEG, while only 26% of those without this symptom complex had an abnormal EEG. Railroad engineers did not show such a tendency. Abnormally slow MCVs or SCVs and/or prolonged motor distal latencies were found in 12 of the 59 car painters but in none of the 53 engineers studied. Other authors have stressed that many solvents primarily cause neuropathy, while objective signs of central nervous involvement have been minor, if any. The authors' findings are similar: they showed slight positive signs of slowed nerve conduction velocities among the car painters and no increase in EEG abnormalities in comparison to the reference group of railroad engineers.

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#### INDUSTRIAL DUSTS AND INHALANTS

- 266/79 Clinical Features, Mortality and Survival of Patients with Asbestosis. M. S. Huuskonen. *Scand. J. Work Environ. Health* 4: 265-274, December 1978. 30 refs.

This paper describes the characteristic clinical features, mortality and survival rate of 202 patients diagnosed as having asbestosis by the Institute of Occupational Health between 1934 and 1976. One hundred and thirty-three patients were subjected to a clinical reexamination. Major findings included breathlessness in 118 (88.7%).

persistent sputum in 95 (71.4%), crepitations in 77 (58.0%) and finger clubbing in 43 (32.3%). Of the 95 patients with persistent sputum, 19 (20.0%) were nonsmokers. Of the 174 men registered as having asbestosis, 56 had died, whereas the expected number of deaths among men of the same age in the Finnish general population was only 23.4. The respective figures for lung cancer were 19 observed and 2.1 expected. No excess mortality was found for other malignomas. Among men with asbestosis, the life expectancy was shorter for smokers than for non- and exsmokers.

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- 267/79 Radiographic and Physiological Findings in Patients with Asbestosis. A. Zitting, et al.  
Scand. J. Work Environ. Health 4: 275-283, December 1978. 22 refs.

Radiographic and respiratory functional findings are reported for a series of 133 Finnish patients with asbestosis. Of these patients, 65 (49%) were found to have radiographically mild diffuse pulmonary fibrosis (profusion 0/1, 1/0 or 1/1), 48 (36%) moderate fibrosis (1/2, 2/1 or 2/2) and 20 (15%) diffuse fibrosis in an advanced stage (2/3 or more). The type of fibrosis was mostly irregular (110 = 83%). Fibrosis was typically the most advanced in the lower zones of the lungs. Of the 133 patients, 88 (66%) showed pleural changes and 78 (59%) pleural calcifications. The more severe the fibrosis, as seen in the radiographs, the greater the decrease in vital capacity (VC) and expiratory volume in 1 s (FEV<sub>1.0</sub>). Transfer factor was generally impaired only in advanced cases of asbestosis (fibrosis 2/3 or more). In general, obstruction was not observed in this series. Pleural changes seemed to decrease VC and FEV<sub>1.0</sub> when the fibrosis was mild (0/1, 1/0 or 1/1). They had no effect on diffusion capacity (T<sub>Lco</sub>).

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- 268/79 Sputum Cytology of Asbestosis Patients. M. S. Huuskonen, et al.  
Scand. J. Work Environ. Health 4: 284-294, December 1978. 25 refs.

One hundred and fourteen patients with asbestosis, 59% of whom were chronic cigarette smokers, were subjected to a cytological sputum examination which showed: 36 workers (31.6%) with squamous metaplasia, 20 (17.5%) with benign columnar cell atypia, 5 (4.4%) with benign dysplasia, 2 with suspicious cells for carcinoma, and 1 with anaplastic (microcellular) carcinoma. Clinically and histologically five lung cancers were verified, two of which were cytologically false negatives. All asbestosis patients with lung cancer were chronic smokers. Of the 114 asbestosis patients, 49 (43.0%) had ferruginous bodies in their sputum. The workers from an asbestos quarry more frequently had ferruginous bodies in their sputum specimens than the other patients. Radiographically moderate and severe asbestosis cases showed squamous metaplasia more frequently than those with radiographically slight asbestosis. Most of the detected cellular atypias represented reversible alterations of the respiratory epithelium. It is, however, important to screen the sputum of older (> 40 years of age) smoking asbestos workers with benign and suspicious cellular atypias regularly because these alterations may represent the first step in the pathway to bronchogenic cancer. The results of this study did not answer the question of whether bronchial cancer of patients with asbestosis is curable if detected early with cytological methods.

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- 269/79 Effects of Asbestos and Asbestos-Quartz-Mixtures in Intraperitoneal Tests on Rats. W. Weller.  
Intl. Arch. Occup. Environ. Health 42 (3-4): 169-183, 1979. 37 refs. (German).

The effects of chrysotile B and crocidolite as well as of quartz-asbestos dust mixtures were studied in intraperitoneal tests with rats lasting up to 6 months. An assessment was made based on organ weight

determinations and pathological examinations. The following results were obtained: The weight of lung lymph nodes, of cranial mesenteric lymph nodes, and most of all the total lymph node weight obtained by addition of both values show an unequivocal correlation to dust injections. Crocidolite provokes a considerable greater quantitative reaction than chrysotile. If mixed with quartz chrysotile has an inhibitory effect, whereas for crocidolite almost an addition of the effects of quartz and asbestos components can be observed. After an injection of chrysotile and crocidolite the modifications in the omentum are rather scarce; they do not occur in other organs. Crocidolite however, causes extensive adhesions of omentum, liver, spleen and diaphragm. Both asbestos dusts are to be classified as fibrogenic; a progression of modifications does not take place. Ferruginous bodies were only found after a test period of 6 months in the group with the highest crocidolite dose. As particular pathological modifications in all crocidolite groups ascites and ovarian cysts were observed. There were no indications as to the pathogenesis of these modifications.

--Author's summary in English

- 270/79 A Comprehensive Program in Asbestos Hazard Surveillance and Education. J. S. Felton.  
Am. Ind. Hyg. Assn. J. 40: 11-19, January 1979.

The surveillance program of asbestos workers at the Long Beach Naval Shipyard consists of a variety of clinical examinations and consultations; educational efforts targeted toward individual patients and groups; environmental measurement; maintenance of pertinent monographic and periodic literature; and records and report maintenance.

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- 271/79 The Routine Monitoring of Airborne Asbestos in an Occupational Environment. A. L. Rickards.  
Ann. Occup. Hyg. 21: 315-322, December 1978. 3 refs.

A description is given of the techniques and strategy employed in the routine monitoring of a major asbestos textile factory employing about 1500 persons where both background and personal sampling is carried out. In order to maintain a regular surveillance of the working efficiency of the many fixed ventilation systems in the factory a rapid monitoring system has been devised, based on a portable Royco particle counter. The instrument has been fitted with an analogue display meter attached to a pistol-grip sampling probe which enables an instantaneous readout of dust level. In addition to the background monitoring system, a personal sampling programme is carried out in which every person working with asbestos in the factory is sampled once every 3 months. Membrane filter samplers are worn for 3-h periods, i.e. approximately one-half of a working shift, while the persons concerned are carrying out their normal job routines. The entire personal sampling operation is based upon a computer-based data control and recording system operating from the company payroll file. The data obtained from personal monitoring are obviously important in the formulation and review of Occupational Hygiene standards and also in identifying areas which require engineering attention.

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- 272/79 Non-Fibrous Mineral Dusts and Malignant Tumors. An Epidemiological Study of Mortality.  
B. A. Katsnelson and K. A. Mokronosova. J. Occup. Med. 21: 15-20, January 1979. 35 refs.

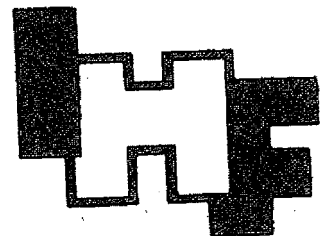
The connection between enhanced oncological risk and the exposure to non-fibrous mineral dusts receives a contradictory but mostly negative estimation in the literature. The present authors estimated the death rate by relating the number of deaths from cancer, registered at different companies during a 21- to 27-year span, to the number of man-years of work for all employees during the same period. The death rates, calculated as above, were

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## INDUSTRIAL HYGIENE DIGEST

### NEWS ITEMS

#### 300/79x Mt. Sinai Investigators Report New Findings on Asbestos Exposure.

Occup. Health & Safety Letter 9: 3-4, March 22, 1979.

The ubiquitous nature of asbestos bodies in the general population, occupational as well as non-occupational, was emphasized by Dr. Arthur M. Langer of Mt. Sinai School of Medicine. He spoke at an International Conference on Critical Current Issues in Environmental Health Hazards in Tel Aviv, Israel. Eleven separate occupational categories, some not considered as high risk groups in asbestos, were selected for analysis in a study of 3,000 consecutive autopsies at three New York City hospitals. Lung parenchyma was selected from seven anatomical sites from both lungs, and the tissues were processed for evaluation of their inorganic particulate content. Quantification of asbestos bodies and uncoated fibers was made for each of 302 cases studied and the individual's occupational and social histories were cross-correlated with histological findings. Selected occupations appear to be associated with asbestos bodies and uncoated fibers in concentrations which reflect intense asbestos exposure. Dr. Langer said. For example, asbestos bodies in lung parenchyma were found in 100 percent of asbestos workers, 85 percent of shipyard workers, 75 percent of construction workers, 60 percent of maintenance workers. The bodies decrease as the percentage of exposure decreases. Another Mt. Sinai investigator, Dr. Ruth Lillis, reported on asbestosis among maintenance workers in the chemical industry. She and her colleagues examined 185 maintenance workers in a chemical plant, most with more than 10 years of employment. Radiologic evidence of parenchymal interstitial fibrosis was found in 24 percent of the 185 workers, and in 11 percent this was the only abnormality. Pleural fibrosis and/or calcification was found in the absence of parenchymal fibrosis in 14 percent of the cases; in another 14 percent, both parenchymal and pleural abnormalities were detected, Dr. Lillis said. The incidence was significantly higher in those employed 20 or more years. Pleural abnormalities were more prevalent than parenchymal changes, she said. The prevalence of chronic bronchitis (by MRC questionnaire) in non-smokers was very similar (19 percent) to that found in present or former smokers (23 percent). Plans were formulated at the meeting for establishment of an international mesothelioma registry, to be located in Israel, with Mt. Sinai School of Medicine serving as a resource.

--Condensed from text

#### 301/79x Business Roundtable Study Finds Noise, Toxic Substances Rules are Most Costly.

Occup. Safety and Health Reporter 8: 1577, March 22, 1979.

A recent Business Roundtable study, conducted by the accounting firm of Arthur Anderson & Company, found that compliance with Occupational Safety and Health Administration regulations cost 48 companies \$184 million in "direct measurable costs" in 1977, \$60 million of which was spent to comply with regulations covering toxic and hazardous substances. The study found compliance with noise regulations the second most costly of OSHA regulations, accounting for the "majority" of the \$30 million spent in the area of occupational health and environmental control. The companies, all large corporations and all members of the 180-corporation Business Roundtable, incurred a total of \$2.6 billion in incremental costs to comply with rules of the six agencies, more than

- 328/79 Pathophysiology of Raynaud's Disease. J. L. Halperin and J. D. Coffman.  
Arch. Internal Med. 139: 89-92, January 1979. 38 refs.

Vasospasm implies reversible vasoconstriction that may diminish blood flow to supplied tissues. Initially described by Maurice Raynaud in 1862, episodic vasospastic ischemia of the digits characterizes Raynaud's phenomenon; the idiopathic variety is termed Raynaud's disease. The typical acute attack comprises sequential phases of digital pallor, cyanosis, and rubor induced by cold or emotive stimuli. The well-demarcated pallor of a part or all of one or more digits during an episode of vasospasm is presumed to derive from spastic constriction of the digital arteries or arterioles, while subsequent cyanosis is attributed to retarded blood flow in dilated capillaries and venules. After a period of minutes to several hours, local rubor develops as a consequence of reactive hyperemia. In some patients only pallor or cyanosis occurs. Dysesthesiae and regional diaphoresis may coincide with the ischemic phase, while throbbing pain often accompanies recovery. Trophic changes of sclerodactyly and, rarely, fingertip ulcerations or gangrene, may develop in severe cases. The diagnosis and treatment of the disease are discussed.

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- 329/79 Identification and Evaluation of Noninvasive Blood Pressure Measuring Techniques. C. R. Hassler, et al.  
Toxicol. Appl. Pharmacol. 47: 193-201, February 1979. 8 refs.

The applicability of noninvasive blood pressure devices to the rhesus monkey and beagle dog during toxicological research protocols was investigated. An extensive literature survey of this subject was undertaken. Newer developments in this field and blood pressure measurement in the two species of interest were noted. A survey of all known manufacturers of noninvasive blood pressure measurement equipment was made. From this list sample devices were selected for animal studies. An acute study was performed on both dogs and monkeys to ascertain the accuracy of the selected devices. The Physiometrics USM-105 device was found to be the most accurate for measuring systolic and diastolic pressures in both dogs and monkeys. In chronic studies, monkeys and dogs were monitored for 3 weeks. The Physiometrics device was found to be the most satisfactory. The Arteriosonde 1011 and Infrasonde devices were found to be acceptable but not as accurate. In dogs, at least 50% of the animals could be trained within 1 week to tolerate blood pressure measurement and give reasonable readings; 75% could be trained in 2 weeks. In monkeys, approximately 60% of the animals would yield reasonable blood pressure readings, and the conditioning and training periods appeared much less critical.

--Authors' abstract reprinted by permission

- 330/79 A Diagnosis of Pleural Mesothelioma. J. F. Caravelli and M. B. Zaman.  
Clin. Bull. 8 (4): 161-163, 1978. 5 refs.

The case reported illustrates that the diagnosis of pleural mesothelioma may require the services of a number of medical specialties. The evaluation of this particular patient was difficult because of the childhood history of a previous "pleurisy," a negative biopsy, and the apparent symptomatic improvement following treatment with antituberculosis medications. The development of a lobulated pleural thickening on radiograph suggested a malignant process, which was confirmed on needle aspiration. This sequence of events ultimately led to the correct diagnosis being made, and appropriate treatment being instituted.

--Condensed from text

proves the existence of silicotic risk in workers. Chest radiographs showed 7 silicotic workers all with working duration of more than 15 years.

--Author's abstract in English

- 367/79 Byssinosis, Chronic Bronchitis and Pathology of Ventilatory Function in a Population of Workers Exposed to Flax Dust. A. Rossi, et al. *Med. Lavoro* 69: 698-707, November-December 1978, 48 refs. (Italian).

One hundred and seventy-six linen workers were submitted to clinical examination and lung function tests. At the same time, a study of the airborne dust was made in the factory, where an abnormally high environmental pollution had been registered ( $> 1 \text{ mg/m}^3$ ). Symptoms were recorded using the European Coal and Steel Commission questionnaire with additional questions on byssinosis. Lung function was studied by measuring lung volumes and the flow/volume curve. The incidence of chronic bronchitis was 16% while only 5 workers showed symptoms of byssinosis. Both the symptoms and the alterations in lung function were related to duration of exposure.

--Condensed from authors' abstract in English

- 368/79 An Experimental Study on Fibrogenicity of the Oil Absorbant Particles Made of Expanded Perlite. A. Ueda, et al. *Jap. J. Ind. Health* 20: 367-373, November 1978. 12 refs. (Japanese).

The authors examined the tissue reaction of the oil absorbant particles made of "expanded" perlite. Five milligrams of perlite dust suspended in 5% alcohol were infused intratracheally into lungs of rats, and 12 weeks after the injection, tissues from the left lung of the rats were examined pathohistologically. Tissue hydroxyproline in the right lung of each rat was quantitatively determined. The results are summarized as follows. Twelve weeks after the injection, some of the alveolar ducts and alveoli were filled with particles of perlite dust, and the wall of these alveoli was thickened in which phagocytes and lymphocytes were observed. Giant cell granulomatous foci and infiltration of numerous mononuclear or rounded cells were found in the interstitium of the intraalveolar septa of the lung. In these foci, fibroblast proliferation was observed, but the replacement of collagen fibers was not so great. Gliallet's cell proliferation was observed sporadically. The amount of tissue hydroxyproline was estimated to be  $3.95 \pm 0.59 \text{ mg}$  (per dry weight) for the perlite group,  $5.62 \pm 0.94 \text{ mg}$  for the quartz sand group and  $6.38 \pm 1.89 \text{ mg}$  for the kaolin group. The results suggest that the particles of "expanded" perlite do not show strong fibrogenicity to the lung tissue. However, the lung would have shown fibrosis slowly but steadily, if a large quantity of perlite particles had been deposited for a long time in the alveoli.

--Authors' abstract in English

- 369/79 Radiological Changes After Withdrawal from Asbestos Exposure. M. R. Becklake, et al. *Brit. J. Ind. Med.* 36: 23-28, February 1979. 9 refs.

A group of 135 ex-employees of the Quebec chrysotile production industry comprising men who were born between 1901 and 1920, who had left the industry between 1950 and 1961, and had been radiographed before leaving, attended in 1972 for a medical examination and further chest radiograph. This report concerns 86 men whose withdrawal film was within 12 months of leaving and who had not been exposed subsequently to asbestos or other fibrogenic dust. Seven separate assessments were made of the paired radiographs, side by side in known temporal order. The assessments were classified as showing 'increase' or 'no change'. In 66 film-pairs from men with two years' employment or longer, at least four assessments were of parenchymal increase in six, of pleural increase in 13, and of both parenchymal and pleural increase in two, total 21 (or 31%). There was similar agreement of no change in 24 pairs (36%), and evidence was equivocal in the remaining 21 pairs. Parenchymal increase was not agreed in any of the 20 film-pairs from men with shorter employment, but pleural increase was seen in four of

these men, a proportion similar to that in those exposed longer. The authors conclude that the parenchymal changes observed after leaving the industry, most of which were 'attacks' rather than 'progression', were attributable to the earlier occupational exposure to chrysotile; there were no important differences in age or smoking habit between those with and without parenchymal change.

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- 370/79 Toxicological Assessment of Potential Hazards from New Inorganic Fibres. G. H. Pigott and J. Ishmael. J. Soc. Occup. Med. 29: 20-21, January 1979. 4 refs.

An experimental programme to evaluate the potential hazard of inorganic fibres is described. Model systems (both in vitro and in vivo) which may be used to evaluate the probable effects of fibres are critically examined and the problems inherent in interpretation of results are discussed. The use of such systems both individually and in combination is illustrated by reference to results obtained from ICI experimental fibres.

--Authors' summary reprinted by permission

- 371/79 Pharmacological Alteration of Oxygen-Induced Lung Toxicity. J. Yam and R. J. Roberts. Toxicol. Appl. Pharmacol. 47: 367-375, February 1979. 44 refs.

The effect of eight selected drugs on oxygen-induced pulmonary injury was evaluated in the rat. Several drug treatments, including meclofenamate (5 mg/kg/day), aminophylline (15 mg/kg/day), and vitamin C (20 and 50 mg/kg/every 12 hr) were found not to alter the survival of rats in 96 to 98% oxygen. Although vitamin E deficiency has repeatedly been shown to aggravate oxygen toxicity, pharmacologic doses of vitamin E (20 and 50 mg/kg/every 12 hr) in animals maintained on a normal diet did not offer protection against oxygen-induced lung toxicity. For the remaining drug treatments, the activity of pulmonary antioxidant defense systems (superoxide dimutase (SOD), catalase (CA), glutathione peroxidase (GP), and reduced glutathione (GSH)) were analyzed to explore the possible mechanism of pharmacological alteration of oxygen toxicity. Lungs from rats treated with dexamethasone (0.4 mg/kg/day) were found to have greater oxygen-induced lung damage and significantly lower pulmonary antioxidant activity. Rats pretreated with propylthiouracil (10 mg/kg/day) showed less oxygen-induced lung damage and greater pulmonary GSH levels and CA activity. Indomethacin pretreatment did not affect the course of oxygen toxicity or the activity of pulmonary antioxidant defense systems. GSH levels were lower in lungs of rats pretreated with levothyroxine (16.7 mg/kg/day), which produced an accelerated development of pulmonary oxygen toxicity. It was concluded that modification of the activity of the pulmonary antioxidant defense systems provides a plausible mechanism in explaining pharmacological alteration of oxygen-induced pulmonary injury.

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- 372/79 Histamine Release from Platelets for Assay of Byssinogenic Substances in Cotton Mill Dust and Related Materials. S. K. Ainsworth, et al. Brit. J. Ind. Med. 36: 35-42, February 1979. 42 refs.

Previous reports suggest that byssinosis, an asthma-like condition among textile workers, may be mediated in part by histamine liberated following inhalation of dust. A simple, sensitive, and reliable procedure using pig platelets which contain the unusually high concentration of 0.8-1.6  $\mu\text{g}$  histamine/ $10^9$  cells has been devised for the assay of histamine-releasing factors in cotton mill dust and related materials, and has yielded results generally in accordance with earlier assays using chopped lung tissue. As little as 50-100  $\mu\text{g}$  of total extractable substances from cotton mill dust can be measured. The activity of the extract is associated with the non-dialysable high

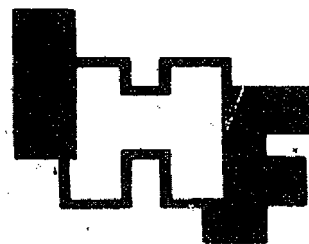
May 1979  
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# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

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ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS

Recognition, Evaluation, and Control  
of Occupational Health Hazards  
For Program — See Center Pages



INDUSTRIAL HEALTH FOUNDATION, INC.  
5231 CENTRE AVENUE      PITTSBURGH, PA. 15232

# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.  
Abstractor: Jean L. Collins, B.A.

May 1979  
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INDUSTRIAL HYGIENE DIGEST

NEWS ITEMS

- 400/79x Asbestos: More Details Revealed in Study of San Francisco Shipyard Workers.  
Occup. Safety & Health Reporter 8: 1632, April 5, 1979.

Results of the first asbestos surveillance study of present and former shipyard workers in the San Francisco Bay area were made public March 24 at a meeting of government officials and concerned community members. The study was conducted by the Western Institute for Occupational and Environmental Sciences, a Berkeley, Calif., organization headed by Philip Polakoff. The findings generally back up those of other asbestos studies, such as those compiled by Irving Selikoff of the Mount Sinai School of Medicine, New York. However, the San Francisco survey for the first time documents adverse health effects suffered by longshore workers and women who worked in shipyards during World War II. Polakoff said his study was not designed so much to add to the scientific literature on asbestos health effects as it was to raise the consciousness of those who have been exposed to the fibers to persuade them to stop smoking and press for benefits to which they may be entitled for disabilities suffered as a result of asbestos exposure. He admitted that minimal funding for the project, mostly from unions, precluded giving detailed medical examinations and pulmonary function tests to each of the 2,270 persons who participated. The survey results are almost certain to give new impetus to drives in California and in Congress to compensate victims of asbestos-related diseases. Any compensation program, even at a state level, is likely to be very costly. Polakoff estimates that 400,000 persons have worked in shipyards in the San Francisco Bay area at one time or another since 1940. Based on his survey's findings half of those appear to be at risk of developing a lung ailment associated with asbestos exposure.

--Condensed from text

- 401/79x Gallup Polls Show 62% of Americans Aware of Asbestos Health Hazards.  
Occup. Health & Safety Letter 9: 5-6, April 8, 1979.

A poll conducted for HEW's National Cancer Institute by Gallup reveals that 62 percent of adult Americans have heard or seen something recently on the health hazards of asbestos exposure. Findings of the poll, taken last October, represent an increase of 12 percent awareness since an earlier Gallup poll last June. The two surveys of 1,500 adults each were conducted in an attempt to gauge the impact of HEW's campaign to inform the public about the hazards of past asbestos exposure. The identical surveys each posed eight questions designed to determine what Americans know about the health risks of past asbestos exposure and what can be done to reduce those risks. "The primary recollection of people who had heard about asbestos was that the substance causes cancer," said Dr. Arthur C. Upton, NCI Director. "However, only four percent correctly stated that quitting smoking could reduce the risks of asbestos-related disease in exposed persons." Special target audiences in the campaign are persons over 50, and manual laborers. Although the older group is most aware of the asbestos hazards, manual laborers still lag behind the general population in their knowledge of the problem. The majority of those who said they had heard or read something about asbestos were able to link asbestos with lung cancer and lung damage, or at least to identify the substance as hazardous, a cause of illness or a source of respiratory problems. On the other hand, many of those

surveyed incorrectly linked asbestos exposure with headaches, heart attacks, high blood pressure and diabetes. Nevertheless, said HEW, this suggests an increase in general awareness linking asbestos exposure to serious disease. The number of persons who know that those exposed to asbestos should see a physician is also increasing. In October, 31 percent of Americans stated that seeking a physician was a way to reduce the health risks of asbestos exposure, whereas in June only 25 percent recognized that fact. The number of people who mentioned the importance of chest x-rays and regular checkups also increased. Public understanding of the link between asbestos exposure and occupation improved somewhat. However, there was not much change with respect to specific occupations. Fewer than one in three in either June or October correctly linked asbestos exposure to installing and replacing brake linings. But nearly eight of ten respondents correctly linked asbestos exposure to occupational settings such as construction, mining and shipbuilding. There was substantial improvement in public understanding that illness related to asbestos exposure may take more than 20 years to develop. However, the level of understanding remains low for the total sample and for the two target sub-groups (over 50 and manual laborers). Most people still do not know when symptoms related to past exposure are likely to occur. HEW's public awareness program urges exposed individuals to seek further information, quit smoking, get medical checkups, and get prompt treatment for respiratory illness. The campaign explains that exposure to airborne asbestos dust increases the risk of developing asbestosis, mesothelioma and lung and certain gastrointestinal cancers. Note: Dr. Sidney Wolfe of Ralph Nader's Health Research Group, and other consumer representatives, complain that the HEW campaign is remiss in not telling workers they have a right to file lawsuits seeking damages against their employers for past or present exposure.

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402/79x Chemical Waste Disposal Survey Begins. Chem. & Eng. News 57: 6, April 30, 1979.

A Congressional investigating panel has sent out highly detailed questionnaires to the 50 largest U.S. chemical manufacturers seeking information on chemical waste disposal practices since 1950. The survey is particularly concerned with abandoned or inactive chemical waste disposal sites. It is the first national survey into chemical waste disposal. Texas Democrat Bob Eckhardt, chairman of the House Commerce Committee's Investigations Subcommittee, insists that chemical firms are the initial target of the survey simply because the industry produces large quantities of potentially dangerous wastes and not because chemical makers are the lone producers of hazardous wastes. "Our objective," says Eckhardt, "is not to assess blame or give undue publicity regarding the disposal practices of this industry or any of its component companies." The chemical industry and closely related industries such as rubber and plastics account for nearly 50% of wastes considered hazardous by the Environmental Protection Agency. Moreover, chemical firms already have been in the hot seat at Congressional inquiries into well-publicized incidents of long-buried chemical wastes rising to the surface, arousing alarm in nearby residents. Eckhardt held a private briefing last week to tell chemical firms what his subcommittee is looking for. Eckhardt had said before that "We are soliciting their cooperation and assistance in locating sites which are now unknown but which may contain time bombs of hazardous materials ticking toward catastrophic health and property damage."

--Condensed from text

403/79x Revisions to Industrial Hygiene Manual Affect OSHA Citation, Inspection Policy.  
Occup. Safety & Health Reporter 8: 1692-1693, April 26, 1979.

Changes in inspection priority and citation procedures are among several revisions which will become effective June 4 in the Occupational Safety and Health Administration's Industrial Hygiene Field Operations Manual. The manual has been under revision for two years by OSHA area, regional, and national personnel, and staff from the

- 477/79 Authors' Corrections to "An Investigation of the Use of Asbestos Cement Pipe for Public Water Supply and the Incidence of Gastrointestinal Cancer in Connecticut, 1935-1973." J. M. Harrington and G. F. Craun.  
Am. J. Epidemiol. 109: 382, March 1979. 2 refs.

The authors call attention to several errors in the published version of their paper which appeared in American Journal of Epidemiology, 107: 96-103, 1978.

--Condensed from text

### PHYSICAL HAZARDS

- 478/79 Industrial Humidification . . . Psychrometric Considerations and Effects of Humidification. A. L. Kaschub.  
Plant Eng. 33: 150-153, March 22, 1979.

The importance of humidification is discussed in a three-part series. The first article looks at psychrometric considerations and the effects of humidification, the second part examines types of equipment, and the third describes how to make load and energy calculations.

--Condensed from text

- 479/79 DeciBels Made Simple. R. Merriman. Occup. Health 31: 116-120, March 1979.

The purpose of this article is to try to help make sense out of noise level figures by explaining the units involved. It is not intended to provide detailed technical knowledge but to produce a 'phrasebook' of some of the language used by the specialist.

--Condensed from text

### RADIATION

- 480/79 Radiation Carcinogenesis and Radiological Protection. G. W. Dolphin.  
Environ. Res. 18: 140-146, February 1979. 20 refs.

With the publication of the latest recommendations of the International Commission on Radiological Protection, several new issues have arisen. The Commission arrives at its recommendations for dose limits using a theoretical or predictive method making use of the data on risks of cancer in populations who have been accidentally or iatrogenically exposed. The issues of importance in this method are discussed, particularly the concept of acceptable risk. An alternative method for setting dose limits, a pragmatic method, involves the study of the cancer incidence in radiation workers and a comparison with cancer incidence in other occupations and industries.

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- 481/79 Assessment and Significance of the Skeletal Doses Due to <sup>210</sup>Po in Radioactive Spa Workers.  
G. F. Clemente, et al. Environ. Res. 18: 120-126, February 1979. 20 refs.

The high exposure due to radon and daughter products found in many Italian radioactive spas, suggested a research program designed to assess the lung and skeletal doses accumulated by the subjects working in those spas. The assessment of such doses will permit the evaluation of the significance of a follow-up of the exposed subjects with

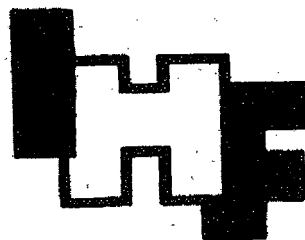
June 1979  
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# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
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ENVIRONMENTAL  
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OCCUPATIONAL HEALTH NURSING -  
PROBLEMS AND OPPORTUNITIES  
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# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.  
Abstractor: Jean L. Collins, B.A.

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chloroform, which showed a specific long-term retention in the cerebellum, meninges and spinal nerves, indicating interactions with specific nervous tissue receptors. Solvent metabolites appeared rapidly in several organs, mainly the liver and kidney, and were excreted both via urine and bile. Toluene and xylene metabolites were completely extractable whereas firmly bound metabolites were registered after inhalation of benzene, styrene and all chlorinated solvents, notably in the liver and kidney but also in the bronchi of the lung. Three-compartment pharmacokinetics were observed for the majority of the solvents selected for study although a two-compartment model was found to fit the elimination rate curves for styrene, methylene chloride and chloroform in the exhaled air. The fat solubility of the solvents was found to influence their pharmacokinetics since lower rate constants were generally obtained for the expiration of more fat soluble solvents.

—Condensed from author's abstract

- 565/79 Respiratory Retention and Acute Toxicity of Furan. J. L. Egle, Jr. and B. J. Gochberg.  
Am. Ind. Hyg. Assn. J. 40: 310-314, April 1979. 10 refs.

The respiratory tract retention of furan has been studied in dogs as part of a broad investigation of compounds found in the vapor phase of cigarette smoke. The LD<sub>50</sub> of furan has also been determined in mice and rats and the LC<sub>50</sub> in mice. Respiratory uptake of furan was between 90 and 95%, varying inversely with the ventilatory rate. Retention was not affected by tidal volume changes but was directly related to concentration inhaled. Intraperitoneal LD<sub>50</sub> values were 5.2 mg/kg for rats and 7.0 mg/kg for mice. The LC<sub>50</sub> for mice was 0.12 µg/mL. These results indicate the high toxicity of furan and that it is readily absorbed by the inhalation route.

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### INDUSTRIAL DUSTS AND INHALANTS

- 566/79 Historical Background to the Asbestos Problem. D. H. K. Lee and I. J. Selikoff.  
Environ. Res. 18: 300-314, April 1979. 95 refs.

This review covers the history of asbestos production and use, and the gradual recognition of its adverse effects on health. A chronological table of the events in the development and manufacture of asbestos from 1857 to 1972 is given. U.S. consumption for 1972 is also tabulated.

—JFB

- 567/79 The Problem of Asbestosis in Spain. F. Segarra. J. Occup. Med. 21: 279-280, April 1979. 9 refs.

About 50 cases of asbestosis have been described in Spain from 1948 through 1974. Since 1975 the Instituto Territorial de Barcelona, Servicio Social de Higiene y Seguridad del Trabajo, has initiated a survey of all the industries with an asbestosis risk in the Barcelona area. Nearly 300 cases of asbestosis have been detected to date. Given the poor hygienic conditions of most of the industries, with an asbestosis risk, and the considerably large number of exposed people, it can easily be predicted that a rapid increase of the incidence of the disease in the years to come will occur. Most of the observed cases in Barcelona were from two fibrocement industries. Of a total of 1003 workers examined, 247 (about 25%) had asbestosis.

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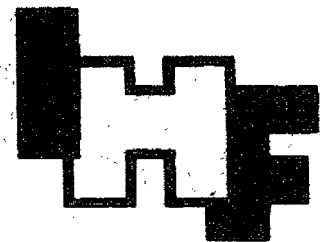
July 1979  
Volume 43, No. 7

# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS

ADVANCED LEVEL COURSE  
IN  
INDUSTRIAL HYGIENE ENGINEERING  
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INDUSTRIAL HEALTH FOUNDATION, INC.  
5231 CENTRE AVENUE      PITTSBURGH, PA. 15232

# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.  
Abstractor: Jean L. Collins, B.A.

July 1979  
Volume 43, No. 7

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and FEF<sub>50</sub> during the day than did controls. More of the smelter workers felt "chest tightness." No change in closing volumes was seen. Smelter workers tended to have a higher percentage of sputum samples with moderate and marked atypia than did controls but the difference was not statistically significant.

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- 658/79 Nonsmoking Grain Handlers in Saskatchewan: Airways Reactivity and Allergic Status.  
J. W. Gerrard, et al. J. Occup. Med. 21: 342-346, May 1979. 14 refs.

This study was carried out to determine whether respiratory disease in Saskatchewan grainhandlers was or was not due to hypersensitivity to grain dust. Sixty nonsmoking grainhandlers, half of whom had low FEV<sub>1</sub>/FVC ratios and half of whom had high, were studied. The findings in grainhandlers were compared with those in 30 age-matched, nonsmoking teachers. In the group of grainhandlers with low FEV<sub>1</sub>/FVC ratios, one had developed asthma associated with exposure to grain dust. The majority were healthy, had FEV<sub>1</sub>/FVC ratios of 70% or greater, and had less evidence of allergic respiratory disease than had age-matched teachers. The studies suggest that non-atopic, nonsmoking men can work in grain elevators without developing respiratory disability, though they may develop a small but significant increase in nonspecific bronchial reactivity to histamine.

--Authors' abstract reprinted by permission

- 659/79 Drywall Construction and Asbestos Exposure. A. Fischbein, et al.  
Am. Ind. Hyg. Assn. J. 40: 402-407, May 1979. 3 refs.

The rapid development of the drywall construction trade in the United States is described. It is estimated that some 75,000 U.S. construction workers are currently employed in this trade. The use of a variety of spackle and taping compounds is shown to be associated with significant asbestos exposure; air samples taken in the breathing zone of drywall tapers during sanding of taping compounds show fiber concentrations exceeding, by several times, the maximum level permitted by United States Government regulations. These findings are given together with the result of a clinical field survey of drywall construction workers demonstrating that asbestos disease may be an important health hazard in this trade.

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#### PHYSICAL HAZARDS

- 660/79 Basic Considerations for Controlling Vibration and Noise from Packaged HVAC Equipment.  
R. S. Jones. Plant Eng. 33: 131-135, May 17, 1979.

Often, vibration and noise control are overlooked when packaged (unitary) rooftop heating, ventilating, and air-conditioning (HVAC) equipment is selected and installed. Vibration and noise problems can usually be predicted, and the solutions are readily available and easy to apply. These are described.

--Condensed from text

- 661/79 Industrial Humidification . . . Load and Energy Calculations. A. L. Kaschub.  
Plant Eng. 33: 83-85, May 3, 1979.

This article describes how to make load and energy calculations. Five factors must be considered in determining the maximum humidification load: 1. Heating load -- Moisture must be added to the heated air to attain the desired relative humidity. Heating load is based on the indoor temperature at its maximum design setting and on outdoor temperature at its minimum design level. 2. Cooling load -- Moisture is removed from the air by condensation in air-conditioning and refrigeration equipment. This moisture may have to be replaced. Cooling load is not important when room temperature ranges are normal and relative humidity levels are below 50 percent. 3. Product load -- Moisture may have to be added or removed from a product to reach its desired regain. Consequently, product load could be a plus or a minus. Product load is not an important consideration unless the regain is substantial. 4. Process reduction -- Some plant processes release moisture to the air. This action decreases the humidification load. 5. People reduction -- Employees release moisture to the air as they work, decreasing the humidification load.

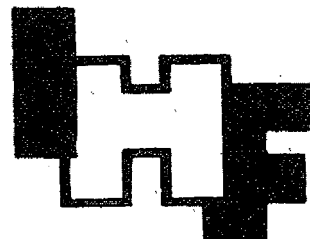
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- 764/79 Pretreatment and Heavy Metal LD50 Values. M. M. Jones, et al.  
Toxicol. Appl. Pharmacol. 49: 41-44, June 15, 1979. 15 refs.

LD50 values, with and without pretreatment with the same ion, have been determined in mice for intraperitoneal injection of salts of the ions  $\text{Cd}^{2+}$ ,  $\text{Hg}^{2+}$ ,  $\text{Ag}^+$ ,  $\text{Tl}^+$ ,  $\text{Pd}^{2+}$ ,  $\text{Au}^+$ ,  $\text{Pt}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Sn}^{2+}$ ,  $\text{Pt}^{4+}$ , and  $\text{Zn}^{2+}$ . In the case of  $\text{Cd}^{2+}$  the previously reported increase in LD50 values subsequent to pretreatment was confirmed. A statistically significant increase in LD50 values for  $\text{Hg}^{2+}$ ,  $\text{Ag}^+$ ,  $\text{Au}^+$ ,  $\text{Cu}^{2+}$ , and  $\text{Sn}^{2+}$  subsequent to pretreatment was also observed.

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#### INDUSTRIAL DUSTS AND INHALANTS

- 765/79 Electrocardiographic Signs of Cor Pulmonale in Asbestosis. K. Kokkola and M. S. Huuskonen.  
Int. Arch. Occup. Environ. Health 43: 167-175, No. 3, 1979. 22 refs.

A cross-sectional study examining the prevalence of electrocardiographic (ECG) signs of cor pulmonale and their correlation with ventilatory capacity was carried out with 130 asbestosis patients and 121 referents. The ventilatory function of 120 of the 130 patients was measured, 41 having a normal  $\text{FEV}_{1.0}$ , 50 slight  $\text{FEV}_{1.0}$  impairment and 29 moderate or severe  $\text{FEV}_{1.0}$  impairment. The cor pulmonale signs were more prevalent in the asbestosis than in the reference group, the greatest differences being found in PII,III, aVF amplitude,  $\text{PV}_1$  amplitude, AQRS deviation to the right and shift of QRS transition to the left. These differences were not, however, statistically significant. The frequencies of electrocardiographic cor pulmonale findings in the three  $\text{FEV}_{1.0}$  categories of asbestosis patients were established. The atrial parameters PII,III, aVF, AP, and  $\text{PV}_1$  correlated the best with  $\text{FEV}_{1.0}$  but only the relationship  $\text{PV}_1/\text{FEV}_{1.0}$  was significant ( $p < 0.05$ ). Most of the ventricular ECG parameters failed to show any association with  $\text{FEV}_{1.0}$ , especially  $\text{SV}_{5.6}$  amplitude, which has displayed a strong positive correlation with  $\text{FEV}_{1.0}$  in many studies dealing with obstructive lung diseases, and terminal notching of QRS. The present study suggests that the atrial ECG variables are the most valuable items for assessing right heart disease in patients with asbestosis.

--Authors' summary

- 766/79 Controlled Studies of Human Exposure to Single and Combined Action of  $\text{NO}_2$ ,  $\text{O}_3$  and  $\text{SO}_2$ .  
G. von Nöding, et al. Int. Arch. Occup. Environ. Health 43: 195-210, No. 3, 1979. 77 refs.

Eleven healthy male subjects aged 23 to 38 years (including 2 smokers) were exposed to purified air (=control experiment), to  $\text{NO}_2$ ,  $\text{O}_3$  and  $\text{SO}_2$  alone, to mixtures of  $\text{NO}_2$  +  $\text{SO}_2$  and  $\text{NO}_2$  +  $\text{O}_3$  in MAK concentration, and to a mixture of  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  in MAK and MIK concentrations for 2 h. Nine of these subjects underwent a bronchial challenge by inhaling in a standardized procedure, an aerosol containing 1%, 2%, and 3% acetylcholine after a 2-h exposure to clean air and to a mixture of  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  in MAK and MIK concentrations, respectively. The following results were obtained: 1. A significant  $\text{PaO}_2$  decrease and  $R_{\text{aw}}$  increase was observed in all series with  $\text{NO}_2$  in MAK concentration as compared to the initial values or the behavior in the controls. 2. The combinations of  $\text{NO}_2$  +  $\text{O}_3$ ,  $\text{NO}_2$  +  $\text{SO}_2$ , or  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  did not show a stronger effect than  $\text{NO}_2$  alone; however, in the latter series, recovery of  $\text{PaO}_2$  seemed to be delayed and  $R_{\text{aw}}$  even increased in the post-exposure period. 3. Exposure to  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  in MIK concentration did not show any effect on  $\text{PaO}_2$  and  $R_{\text{aw}}$ . 4. Acetylcholine challenge following exposure to a combination of  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  in MIK concentration resulted in a significantly increased reactivity to Ach as compared to the control series. Increased reactivity became more pronounced after exposure to the mixture of  $\text{NO}_2$  +  $\text{SO}_2$  +  $\text{O}_3$  in MAK concentration. From the results of this study and previous data there is a special need for re-evaluation of the present  $\text{NO}_2$  MAK concentration (5ppm; 9 mg/m<sup>3</sup>).

--Authors' summary

- 767/79 Passive Smoking: Irritating Effects of the Total Smoke and the Gas Phase. A. Weber, et al.  
Int. Arch. Occup. Environ. Health 43: 183-193, No. 3, 1979. 23 refs.

In a ventilated climatic chamber 32 subjects (in groups of two or three) were exposed in one experiment to the total sidestream smoke of cigarettes and in another experiment to the gas phase of cigarette smoke, which was obtained by filtering out the particulate matter. The degree of air pollution corresponded to 10 ppm CO in both experiments. The concentrations of the particulate matter, CO, NO, NO<sub>2</sub> and HCHO were recorded. With a questionnaire, the authors determined the degree of annoyance and of subjective irritations of the eyes, nose and throat; eye blink rate was measured, as an objective indicator of eye irritation. Both exposures of air pollution produced nearly the same degree of annoyance, which indicates that the gas phase is to a large extent responsible for the annoyance due to cigarette smoke. On the other hand the objective and subjective eye irritation was very much lower with the gas phase than with the total smoke. This indicates that the particulate phase is to a very large extent responsible for the irritating effects. --Authors' summary

- 768/79 Formation of Carbon Monoxide in Air Compressors. T. M. Distler.  
Am. Ind. Hyg. Assn. J. 40: 548-551, June 1979. 12 refs.

Oil-lubricated compressors are said to contaminate the air they compress with carbon monoxide from pyrolyzed and oxidized lubricants. Experiments were performed in an instrumented compressor to determine if synthetic oils as lubricants would result in less contamination. The results suggest that for all oils the contamination is actually not great. Published results from low-temperature oxidation of hydrocarbons support this estimate.

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- 769/79 Cotton Dust Sampling Efficiency of the Vertical Elutriator. K. Q. Robert, Jr.  
Am. Ind. Hyg. Assn. J. 40: 535-542, June 1979. 32 refs.

A theoretical model of the vertical elutriator air sampler based upon the phenomenon of flow separation at the inlet was developed at SRRC. The model's equations were simulated by a computer program (VELUT). The model was calibrated by comparison of available experimental results to isokinetic sampling efficiencies calculated by the model. The calibrated model was used to predict integral efficiencies for a systematic assortment of size distributions of cotton dust. Rather than cutting off cleanly at 15 micrometers, the computer model exhibited a 50% differential efficiency at approximately 20 micrometers. Furthermore, the model predicted substantial non-zero collection efficiencies in the aerodynamic size range of individual cotton fibers. Program VELUT represents an objective method whereby the isokinetic sampling efficiency of the vertical elutriator can be explicitly calculated for any known or postulated ambient dust distribution presented to the sampler at its inlet plane.

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- 770/79 Evaluation of Dust Exposure in Asbestos Cement Manufacturing Operations. Y. Y. Hammad, et al.  
Am. Ind. Hyg. Assn. J. 40: 490-495, June 1979. 10 refs.

Previous investigations of the health of workers of the asbestos cement industry have demonstrated dose-response relationships for the diffuse radiographic changes of asbestosis and pulmonary function impairment. Studies of the mortality experience of past employees have also identified levels of cumulative exposure above which an excess of respiratory cancer could be detected. These epidemiologic studies were based on particulate concentrations determined by the midget impinger. The authors attempted to develop information that might lead to conversion of particulate to fiber concentrations in the industry in order that the risk assessment could be related to the current membrane filter methods. Pairs of impinger and membrane filter samples were taken in the various areas of the plant. Personal samples were also taken to determine the current exposure of workers. The ratio of fiber concentration to particle count varied from 0.63 to 2.5. Poor correlation (0.18) was obtained at low fiber and particle counts and good correlation (0.91) was demonstrated in dusty areas where asbestos and silica were handled in a dry form. The concentration of fibers in 80% of the personal samples was less than 2 fibers/cc, and 60% were less than 0.5 fibers/cc. The results also show that no one conversion factor can be used for all areas of this type of operation.

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- 775/79 The Effect of Carbon Monoxide upon Erythrocyte  $\delta$ -Aminolevulinicacid Dehydratase Activity.  
M. R. Moore and P. A. Meredith. Arch. Environ. Health 34: 158-161, May/June 1979. 11 refs.

The activity of the  $\delta$ -aminolevulinicacid dehydratase enzyme in the second reaction of the heme biosynthetic pathway has been determined in human blood in the presence of varying concentrations of carboxyhemoglobin. In vivo and in vitro carbon monoxide exposure causes a consistent, but small, significant diminution of activity. At concentrations of carboxyhemoglobin likely to be found in vivo it is unlikely to significantly influence the use of this enzyme as a measure either of lead exposure or of ethanol consumption.

--Authors' abstract

- 776/79 Effects of Asbestos and Beryllium on Release of Alveolar Macrophage Enzymes. K.-Y. Kang, et al.  
Arch. Environ. Health 34: 133-140, May/June 1979. 21 refs.

Rabbit alveolar macrophages were exposed in culture medium to asbestos, beryllium sulfate, and beryllium oxide. The specific activities of the lysosomal hydrolases, acid phosphatase  $\beta$ -N-acetylglucosaminidase and  $\beta$ -glucuronidase plus the glycolytic enzyme, phosphohexose isomerase were determined in the medium, whole-cell homogenates, mitochondrial fractions, and supernatant. These hydrolases increased significantly in the medium but not in the mitochondrial fraction of cells exposed to dusts. Asbestos and beryllium sulfate were highly cytotoxic for alveolar macrophages in vitro and the data suggested that these agents were not associated with an increase in enzyme synthesis but rather a direct cytotoxic effect at the macrophage membrane level. For induction of enzyme release in vitro, a higher concentration of beryllium oxide was needed when compared with asbestos and beryllium sulfate. The cytotoxicity and enzyme release induced by these agents may represent an important nonspecific mechanism by which they induce inflammation and perhaps local proliferation of fibroblasts.

--Authors' abstract

- 777/79 Conduction Velocity in the Peripheral Nerves of Rats with Chronic Carbon Disulphide Neuropathy.  
K. Knobloch, et al. Brit. J. Indus. Med. 36: 148-152, May 1979. 9 refs.

Effects of carbon disulphide ( $\text{CS}_2$ ) on conduction velocity in sciatic and tibial nerve were investigated in rats exposed to  $\text{CS}_2$  vapour at concentrations of 0.9 mg/l or 1.6 mg/l of air for periods of 1.5, 3, 6, 9 and 12 months. The conduction velocity was measured on the day following each exposure period, and again, three and six months after the last day of exposure. The majority of exposed rats showed a reduction in conduction velocity on the day after exposure: the extent of this reduction was dependent on the  $\text{CS}_2$  concentration and the duration of exposure. Exposure for 1.5 months to 1.6 mg  $\text{CS}_2$ /l produced temporary and fully reversible impairment of conduction velocity. Increased exposure to  $\text{CS}_2$  (3, 6 or 9 months at 1.6 mg/l; 6 or 12 months at 0.9 mg/l  $\text{CS}_2$  in air) caused a reduction in velocity which was only partially reversible.

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- 778/79 HLA Antigen Frequencies in Flax Byssinosis Patients. D. Middleton, et al.  
Brit. J. Indus. Med. 36: 123-126, May 1979. 14 refs.

Not all workers exposed to flax dust contract byssinosis. It is not known what determines susceptibility or insusceptibility. This study is an attempt to establish whether the incidence of histocompatibility antigens is involved in susceptibility to the disease. Forty patients suffering from flax byssinosis were tissue-typed for HLA-A and -B antigens. HLA-B27 was significantly more common in the patients (22.5%) than in the controls (5.5%);  $P = 0.029$  after correction for the number of antigens compared. HLA-A11 was present in twelve patients (30%) compared with 14% in the controls; after correction for the number of comparisons, this is not a statistically significant increase. Because HLA-B27, though significantly more common in flax byssinosis, is not necessary for its occurrence (77.5% of the patients did not have it), it is possible that the increase in the frequency of HLA-B27 is attributable to an association with other genes, perhaps those regulating the immune response or coding for antigens at other HLA loci.

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- 779/79 Inhibition by Phospholipids of Haemolytic Action of Asbestos. M. C. Jourand, et al. *Brit. J. Indus. Med.* 36: 113-116, May 1979. 12 refs.

Haemolysis by asbestos fibres results from an increase in membrane permeability and not from rupture of red blood cells (RBC). The effect of chrysotile asbestos on RBC is at least partly, if not completely, attributable to lipid extraction and adsorption on to the fibres. This was suggested by the hyperbolic relationship between the haemolytic activity of chrysotile and the relative concentration of both chrysotile and RBC. Moreover, it was shown that pre-incubation of chrysotile with lipids, either as RBC membranes or with pure lipids in the form of liposomes, prevents haemolysis. --Authors' abstract reprinted by permission

- 780/79 Asbestosis. A Study of Dose-Response Relationships in an Asbestos Textile Factory. G. Berry, et al. *Brit. J. Indus. Med.* 36: 98-112, May 1979. 17 refs.

A group of 379 men who had worked at an asbestos textile factory for at least 10 years has been followed up. The prevalence of crepitations, 'possible asbestosis', certified asbestosis, small opacities in the chest radiograph and values of lung function have been related to dust levels. The type of asbestos processed was predominantly chrysotile although a substantial amount of crocidolite had also been used in the past. There was a higher prevalence of crepitations than had been observed previously at the same factory. The presence of crepitations is not a specific effect of asbestos exposure and 'possible asbestosis', a combined judgment of two physicians on whether a man had developed signs which might be attributable to early asbestosis, was preferred. Fifty per cent of men with a diagnosis of possible asbestosis were certified as suffering from asbestosis by the Pneumoconiosis Medical Panel within 3.5 yr. The most reliable data relate to men first employed after 1950; 6.6% of men in this group had possible asbestosis after an average length of follow-up of 16 yr. and an average exposure to 5 fibres/cm<sup>3</sup> where the dust levels were determined by static area samplers. The forced expiratory volume and forced vital capacity declined significantly with exposure, after allowing for age and height, but there was no decline in the total lung capacity. The transfer factor also declined with exposure, but not to a statistically significant extent. The non-smokers and light smokers as a group had less crepitations, asbestosis and small opacities on the chest radiograph than heavier smokers with similar exposure. Combining dust concentrations to form the cumulative dose may not be completely satisfactory, and a family of measures was investigated which allows for elimination of dust from the lungs and includes the cumulative dose as a special case. Because the rate of elimination of dust from the lungs is unknown, and cannot be estimated from the data, this approach leads to a wide range of possible interpretations of the data; for example the concentration such that possible asbestosis occurs in no more than 1% of men after 40 years' exposure could be as high as 1.1 fibres/cm<sup>3</sup> or may have to be as low as 0.3 fibres/cm<sup>3</sup>. This range is wide because the data relate to higher dust levels, and a shorter period of follow-up. Until data are available on groups exposed to lower levels it will not be possible to assess the effects of the current standard with any certainty. However, the results of this study show that it is important to continue to reduce dust levels to values as low as possible. --Authors' abstract reprinted by permission

- 781/79 Effects of Chronic Amorphous Silica Exposure on Sequential Pulmonary Function. R. K. Wilson, et al. *J. Occup. Med.* 21: 399-402, June 1979. 9 refs.

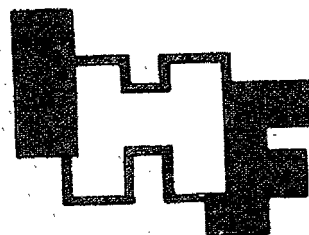
To assess clinical effects of precipitated amorphous silica (PAS), the authors reviewed serial spiromograms, respiratory questionnaires, and chest radiographs of 165 workers exposed for a mean of 8.6 years. Monthly exposure was graded on a 1 to 4 scale and a "cumulative exposure index" (CEI) calculated for each worker from the sum of measured exposure. A "mean exposure index" (MEI) was calculated by dividing the CEI by total months exposed. Sputum production and dyspnea were inversely correlated with CEI, while cough and dyspnea correlated with mean pack-years of smoking but not PAS exposure. Linear regression analysis of yearly change of all pulmonary function variables (FVC, FEV<sub>1</sub>, FIV<sub>1</sub>/FVC, FEV<sub>1</sub>/FVC) showed no correlation with either the dose of PAS (CEI) or total years of exposure. Among 44 workers with a mean exposure time of 18 years (range 10-35 years), yearly decline of FVC and FEV<sub>1</sub> were similar to the overall group. Of 143 workers with serial radiographs and exposure to only PAS, none had radiographic pneumoconiosis. Respiratory symptoms in PAS workers correlate with smoking but not with PAS exposure, while serial pulmonary function values and chest radiographs are not adversely affected by long-term exposure. --Authors' abstract reprinted by permission

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INDUSTRIAL HYGIENE DIGEST

NEWS ITEMS

- 810/79x Lead Industries Association Publishes Results of Kehoe Experiments With Lead.  
Occup. Safety & Health Reporter 9: 221. August 2, 1979.

A book compiling the results of 35 years of experiments on the health effects of human exposure to lead was published by the Lead Industries Association, which called the experiments "the most extensive and intensive investigation of the physiology of lead in humans." The book, Oral and Inhalation Lead Exposures in Human Subjects, as written by Stanley B. Gross and details the experiments performed between 1937 and 1972 by Robert A. Kehoe, a leading researcher on the health effects of lead. Under a contract with the Ethyl Corporation, Gross performed the extensive review of Kehoe's work while an environmental toxicologist with the University of Cincinnati's Department of Environmental Health at Kettering Laboratory. Gross is currently a senior level toxicologist with the Environmental Protection Agency. According to LIA, Gross' book presents for the first time a complete review of all of Kehoe's works including the results of some studies never before published. An LIA spokesman said the association published the book as a scientific resource. Gross' 71-page report presents many of the raw data and numerous statistical summaries which provide an overview of all of the experiments, LIA said. Copies are available from LIA, Inc., 292 Madison Avenue, New York, NY 10017.

--Condensed from text

- 811/79x Transportation of Asbestos; Additional Revisions of Amendment No. 173-123. Materials  
Transportation, DOT. Fed. Reg. 44: 47937-47938, August 16, 1979.

These revisions to Amendment No. 173-123 (44 FR 18673, March 29, 1979) will permit carriage of asbestos: (1) by private carrier in dust and sift-proof bags and other non-rigid packaging without palletizing and unitizing; (2) in dust and sift-proof bags and other non-rigid packagings within fiberboard or wooden boxes when shipped in less than pallet load quantities. This revision also clarifies the authority to ship leaktight hopper cars and leaktight hopper motor vehicles, and provides a grandfather clause for shipments initially shipped and transported prior to August 20, 1979.

--Summary reprinted

- 812/79x Battelle Research Finds Carcinogens in Major Synthetic Fuel.  
Job Safety & Health Report 9: 125-126, July 31, 1979.

Researchers at Battelle Pacific Northwest Laboratories disclosed recently that their studies have positively identified the existence of carcinogens in second generation solvent refined coal (SRC II), a coal liquefaction process for the making of the synthetic fuel. The discovery comes at a time when President Carter's new energy program puts heavy emphasis on synthetic fuels, including SRC II. One substance found by Battelle is beta naphthylamine which was classified as a carcinogen in 1974. The chemical was known to cause bladder cancer in workers manufacturing coal tar dyes. In a survey of the British chemical industry, the probability of a worker who was exposed to the chemical developing a bladder tumor was 61 times greater than that of the general population. Elapsed time from exposure to first signs of cancer range from one to 35 years, according to these British tests. While population studies in the past have shown that there are higher probabilities of skin cancer occurring in those exposed to coal liquids, Battelle's ongoing work is the first to specifically identify a known carcinogen in a coal liquid. These interim results of Battelle's study, which will not be released for more than a year, were first presented to an in-house group of environmental researchers at the end of June in Research Triangle Park, N.C. Concerned sources there were anxious that the discovery not be buried until the report is published, especially in light of the recent interest in coal-based synthetic fuels. When first contacted in Richland, Wash., Battelle officials working on the project were not anxious to discuss their findings. They cautioned against releasing findings of such a "delicate nature" before the work has been completed.

--Condensed from text

- 886/79 Lung Cancer and Coal Workers' Pneumoconiosis. M. Jacobsen.  
Brit. Med. J. 2: 208, July 21, 1979. 1 ref.

In a letter to the Editor, the writer summarizes the results of his PhD thesis. The author reported a 16-year mortality follow-up of 16,628 coalminers. Complicated pneumoconiosis (PMF) had been diagnosed radiologically for 685 of these men at the start of the study period, and 13,265 had no pneumoconiosis (category 0) initially. The average age-standardized death rate attributed to lung cancer among those with PMF was about half that found for miners with radiographs classified as category 0. Lung cancer mortality among men with categories 2 or 3 simple pneumoconiosis was also relatively low. He studied these findings further in subgroups involving more than 11,000 of the miners. Those analyses took into account the men's smoking habits and estimates of their cumulative exposure to coalmine dust. There was no evidence of a protective effect of dust exposure among men with no pneumoconiosis initially and he commented in that context that "the reduced lung cancer incidence among men with pneumoconiosis is more likely to be explicable in terms of the presence of pathology associated with radiological pneumoconiosis, rather than as a consequence of dust exposure per se." Taken out of context this argument could be misunderstood by miners and readers of the BMJ. In his discussion of the results he noted that "the very high (nearly eightfold) excess lung cancer mortality among the cigarette-smoking coalminers studied, compared with their non-smoking colleagues, makes it abundantly clear that neither coalmining as such, nor exposure to dust can be regarded as an effective protection from the disease."

--Condensed from text

- 887/79 Asbestos: Some Answers. National Safety Council. Natl. Safety News 120: 51-55,  
July 1979. 7 refs.

A brief review of the nature, use and hazards of occupational exposure to asbestos. Sources of additional information are listed.

--JFB

- 888/79 Generation of Respirable Aerosols of Power Plant Fly Ash for Inhalation Studies with Experimental Animals. O. G. Raabe, et al. Environ. Sci. Technol. 13: 836-840,  
July 1979. 16 refs.

Methods and equipment have been developed and used for the laboratory generation of fly ash aerosols that simulate respirable particles in effluents from coal-burning power plants. Size-classified fly ash particles smaller than 5  $\mu\text{m}$  in aerodynamic diameter were dispersed with a Wright dust feed mechanism and passed through a specially built cyclone separator to remove agglomerates and large particles. An  $^{85}\text{Kr}$  discharger reduced the aerosol electrostatic charge distribution to Boltzmann equilibrium. The resulting aerosol was introduced into a 3.5- $\text{m}^3$  exposure chamber suitable for exposure of rodents or nonhuman primates. During a 180-day exposure period, aerosol samples collected by electrostatic precipitation and examined by both transmission and scanning electron microscopy had an average count median diameter of 0.68  $\mu\text{m}$  (0.2  $\mu\text{m}$  SE), with an average geometric standard deviation of 1.54 (0.02 SE). Aerodynamic size distributions, determined with a cascade impactor, had an average mass median aerodynamic diameter of 1.98  $\mu\text{m}$  (0.02  $\mu\text{m}$  SE), with an average geometric standard deviation of 1.65 (0.02 SE). The mean mass concentration was 4.2  $\text{mg}/\text{m}^3$  (1.4  $\text{mg}/\text{m}^3$  SD). The methods described are suitable for use in laboratory studies requiring reaerosolization of collected fine particulate matter.

--Author's abstract reprinted by permission

- 889/79 On Fibrogenic Actions of Carbon-Containing Dusts. B. T. Velichkovsky, et al.  
Gig. Trud. Prof. Zabol. (5): 1-5, 1979. 8 refs. (Russian).

Experiments on rats have indicated that the rate of fibrosis development in the lungs on exposure to dusts of technical grade oxidized and graphitized carbons increases with the degree of oxidation of the dust particle surface. The main chemical groups responsible for the process are the carboxyl and phenol groups.

--Author's summary in English

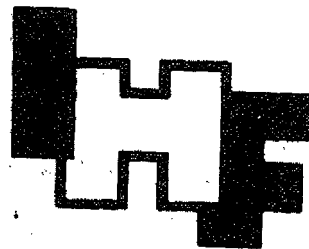
October 1979  
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# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS

CHANGING CONCEPTS  
IN  
OCCUPATIONAL MEDICINE  
For Program -- See Center Pages



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# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin M.L.S.  
Abstractor: Jean L. Collins, B.A.

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prohibit a worker from suing his or her employer for work-related injuries or illnesses. But the attorneys for Arnett said that recent evidence which indicates Occidental knew DBCP was in the drinking water supply of the plant, but did nothing about it, provides cause for action against the firm for intentional and willful injury. A high rate of sterility among workers at the Lathrop plant was first discovered in September 1977, and resulted in the issuance of an emergency temporary standard by the Occupational Safety and Health Administration. Arnett charged in his suit that his DBCP exposure caused his sterility, which was reversed when the plant ceased manufacturing the pesticide. The suit alleges that Arnett's 10-month-old son's deformities, which at birth included a hernia, an irregularly placed hole in his penis, and a finger that will not straighten, were caused by the father's exposure to DBCP. The complaint was filed as an amendment to an earlier suit against several chemical companies and researchers which alleged the defendants failed to publicize their research on the harmful effects of DBCP. Spokesmen for Occidental Chemical Co. said they had not yet been informed of the suit, and therefore had no comment.

--Text reprinted by permission

- 934/79x Pittsburgh Corning Workers Sue Over Asbestos-Related Disease. Anon.  
Job Safety & Health Report 9: 148, September 11, 1979.

Charging that Pittsburgh Corning Corporation "intentionally exposed its workers to asbestos, knowing of its dangerous properties," 31 current or former employees and 25 of their wives have filed suit against the firm, its parent companies (PPG Industries, Corning Glass Works) and firms that supplied asbestos to Pittsburgh Corning. The suit seeks full money damages against each company for its role in allegedly causing the workers to contract asbestosis between 1964 and 1972. The suit further charges that the firm "misrepresented the health dangers posed by asbestos exposure and in several respects failed to provide its workers adequate protection against asbestos exposure." Workers involved were diagnosed as having asbestosis by doctors at the Mt. Sinai Medical Center in New York City.

--Text reprinted by permission

- 935/79x Congress Sued Over Clean Air Violations. Anon.  
Chem. & Eng. News, 57: 18, September 1979.

The Capital Legal Foundation, a public-interest legal center, has filed suit against the U.S. Congress to force it to comply with the Clean Air Act in its operation of the Capitol Power Plant, which supplies heat and air conditioning to the Capitol and to Congressional office buildings. The foundation warned Congress in May that unless within 60 days the plant complied with the visual emission requirements of the act, Congress would be sued. The suit seeks a court order directing Congress to cease immediately plant operations that result in violations and to install the latest pollution abatement equipment within a reasonable time. Congress usually exempts itself from coverage under the laws it passes, but for some reason didn't do so in the Clean Air Act.

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- 936/79x OSHA Refers Alabama and Ohio Job Fatality Cases to Justice Department. Anon.  
News (U.S. Dept. of Labor) p. 1, September 12, 1979.

The U.S. Department of Labor's Occupational Safety and Health Administration announced it is referring to the Justice Department for possible criminal prosecution two cases involving deaths of three employees. On February 27, 1979, Jimmy Dale Parker and Lenas Childress, employees of the Brown Steel Contractors, Incorporated, in Curry, Alabama, were killed when engaged in erecting a steel water storage tank. The incident arose when the men were riding on a load which was being hoisted by a guyless derrick. The load fell, killing them both. On December 22, 1978, James F. Pribble, an employee of the Complete General Construction Company in Washington Court House, Ohio, was killed when one wall of a 20-foot deep unshored trench collapsed. The fatality occurred while Pribble was leveling gravel in the trench at a sewer construction site. The Occupational Safety and Health Act of 1970 provides that, "Any employer who willfully violates any standard...promulgated (under) this Act, and that violation caused death to any employee, shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than six months, or by both..." The deaths were investigated by the federal Occupational Safety and Health Administration; no further details of the cases can be disclosed pending Justice Department review.

--Text reprinted

- 1008/79 Asbestos and Smoking. I. J. Selikoff and E. C. Hammond.  
J. Am. Med. Assn. 242: 458-459, August 3, 1979. 4 refs.

New data are cited on the relationship between asbestos exposure and lung cancer. A follow-up of 12,051 asbestos insulation workers from January 1, 1967 through December 31, 1976 showed death rates for lung cancer per 100,000 man-years, standardized for age as follows: 11.3 for men who neither worked with asbestos nor smoked cigarettes, 58.4 for men who worked with asbestos but did not smoke, 122.6 for cigarette smokers who had not worked with asbestos, and 601.6 for those unfortunate enough to have had both exposures--cigarettes and asbestos. By itself does asbestos increase the risk of lung cancer? The answer is yes. But even four or five times the risk, when the base risk is low (as it is for nonsmokers in general), does not result in many cases. (Clearly, any excess is undesirable.) On the other hand, smoking itself causes a major increase, and when that high risk is then multiplied manyfold, an immense increase is found; among asbestos workers, unhappily, one in every five deaths is due to lung cancer. The newest data carry the asbestos-smoking interaction a step further--to increased risk of death of asbestosis. Again, asbestos exposure by itself carries the risk of fatal progressive pulmonary fibrosis. In this series, five men who never smoked cigarettes died of asbestosis. But the asbestosis mortality for men who smoked a pack or more a day was 2.8 times as high as the asbestosis mortality for men who never smoked regularly. Smoking, with its own bronchitis, emphysema, and fibrosis, adds an undesirable and sometimes unsupportable burden to the asbestos-induced pneumoconiosis.

--Condensed from text

- 1009/79 Automatic Detection and Counting of Asbestos Fibers.  
Vickers Instruments, Inc. Am. Ind. Hyg. Assn. J. 40: A-50--A-53, July 1979.

Two new techniques developed in Britain will enable hazards due to airborne asbestos fibers to be assessed more quickly, more reproducibly and more accurately than by current manual counting methods. One is suitable for the immediate analysis of samples collected from working environments; the other is intended to aid compliance with health and safety legislation as well as research into improved safety standards. Both techniques can be extended to evaluations of other fibrous materials.

--Condensed from text

- 1010/79 Mesothelioma and Exposure to Mixtures of Chrysotile and Amphibole Asbestos.  
E. D. Acheson and M. J. Gardner. Arch. Environ. Health 34: 240-242, July/August 1979. 16 refs.

This paper provides a new analysis of previously published work and draws attention to the possibility that mixtures of amphiboles and chrysotile appear more commonly in the lungs of mesothelioma patients compared to controls than do either of the main types of fiber alone. The possibility that these results may indicate a synergistic interaction between chrysotile and the amphiboles is discussed in the light of the epidemiological data.

--Authors' abstract

- 1011/79 Numbers of Asbestos Bodies in Urban Patients with Lung Cancer and Gastrointestinal Cancer and in Matched Controls. A. M. Churg and M. L. Warnock.  
Chest 76: 143-149, August 1979. 25 refs.

The authors compared the numbers of asbestos bodies extracted from the lungs of 103 patients with lung cancer and 50 patients with gastrointestinal malignant neoplasms to the numbers of bodies extracted from lungs of control patients matched for age, sex, smoking habits, and, in some cases, occupation. All patients were urban dwellers over the age of 40 years, and none was a primary asbestos worker. No differences in the counts of asbestos bodies were observed between the tested and control populations. The numbers of asbestos bodies did correlate well with occupation; the highest counts were found in male manual laborers. The authors conclude that in the urban population studied herein, the numbers of asbestos bodies alone do not correlate with the presence of pulmonary or gastrointestinal carcinoma; however, uncoated asbestos fibers are also known to be present in the lung, and the possibility that such tumors may be related to the numbers of these fibers in lungs remains to be explored.

--Authors' abstract reprinted by permission

- 1012/79 Determination of Inorganic Fiber Density in Human Lung Tissue by Scanning Electron Microscopy After Low Temperature Ashing. B. Gylseth, et al.  
Scand. J. Work Environ. Health 5: 151-157, June 1979. 22 refs.

The concentration of asbestos fibers in lung tissue may give information about previous occupational asbestos exposure. A procedure for the preparation, quantification and identification of asbestos fibers in human tissue is presented in this report. The procedure is based on low-temperature plasma ashing of dry tissue, examination of the ash by scanning electron microscopy, and energy dispersive X-ray microanalysis. The advantages and disadvantages of this method are also discussed briefly.

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- 1013/79 Respiratory Response of Guinea Pigs to Oil Mists. D. L. Costa and M. O. Amdur.  
Am. Ind. Hyg. Assn. J. 40: 673-679, August 1979. 29 refs.

Respiratory function was measured in guinea pigs exposed for one hour to submicrometer oil mists. Five oils were used: medicinal grade mineral oil, laboratory grade paraffin oil, light lubricating oil, unused motor oil and used motor oil. The last three oils were also studied after having been reacted with sulfur dioxide. No alterations were produced by exposure to any of the oils at concentrations of 10 or 40 mg/m<sup>3</sup>. At concentrations above 200 mg/m<sup>3</sup> both the reacted and unreacted light lubricating oil caused a decrease in compliance which remained throughout the post-exposure period. Although the average flow-resistance of the group was increased by the unreacted unused motor oil and by the reacted used motor oil, the variation in response was too great to make this response statistically significant. The fact that reaction of the oils with sulfur dioxide did not increase irritant action indicates that the reaction products with sulfur dioxide are not acutely irritant.

--Authors' abstract reprinted by permission

- 1014/79 Effect of Oil Mists on the Irritancy of Sulfur Dioxide--  
1: Mineral Oils and Light Lubricating Oil. D. L. Costa and M. O. Amdur.  
Am. Ind. Hyg. Assn. J. 40: 680-685, August 1979. 19 refs.

The increase in pulmonary flow resistance in unanesthetized guinea pigs was used to assess the effect of sub-micrometer oil aerosols on the response to sulfur dioxide. At a concentration of about 10 mg/m<sup>3</sup> neither a medicinal grade mineral oil nor a light lubricating oil altered the response when given simultaneously with 1 or 10 ppm sulfur dioxide. The naphthenic medicinal oil at 100 mg/m<sup>3</sup> failed to protect against 50 ppm sulfur dioxide when administered simultaneously. A 30-minute pre-exposure, however, conferred complete protection. A paraffinic laboratory grade mineral oil conferred protection when given simultaneously but was less effective when the pre-exposure protocol was used.

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- 1015/79 Analysis of Ethylene Oxide--Worker Exposure. S. J. Romano and J. A. Renner.  
Am. Ind. Hyg. Assn. J. 40: 742-745, August 1979. 6 refs.

A personal air sampling method for assessing individual worker exposure to ethylene oxide has been developed. The method is based on trapping ethylene oxide in dilute sulfuric acid where it is converted to ethylene glycol. The ethylene glycol is determined by gas chromatography using a glass column packed with 5% Igepal CO-990 on Teflon T-6. This column produces linear calibration curves and symmetrical peaks. The method has been shown to recover 94.2% ethylene oxide in the 1 to 8 ppm concentration range. The sampling technique is independent of flow and sample size. Advantages over the NIOSH method are discussed.

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- 1016/79 Pollution of Delivery Ward Air by Nitrous Oxide--Methoxyflurane.  
B. Dahlgren, et al. Am. Ind. Hyg. Assn. J. 40: 666-672, August 1979. 25 refs.

Pollution of delivery ward atmosphere by analgesic gases and vapors has not been studied as extensively as pollution of operating theaters. This study shows that delivery room atmosphere is polluted by methoxyflurane (0.5-0.8 ppm) and nitrous oxide (300-540 ppm) and that a local gas exhaust system reduces the concentration by half.

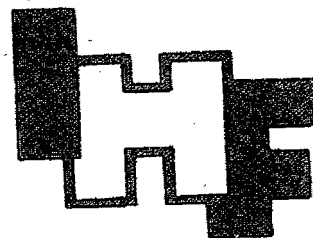
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# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS



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# INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.  
Abstractor: Jean L. Collins, B.A.

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INDUSTRIAL HYGIENE DIGEST

NEWS ITEMS

- 1041/79x Synthetic Fuels Derived from Coal May Be Potent Carcinogens, Exxon Says.  
Occup. Safety & Health Reporter 9: 434-435, October 4, 1979.

A variety of synthetic fuel oils derived from coal show evidence of "high carcinogenic potency" in tests on mice, according to Exxon Corporation. The company reported its findings to the Environmental Protection Agency September 19 as a notification of substantial risk under Section 8(e) of the Toxic Substances Control Act. Four coal-derived fuels are being tested for carcinogenesis on mouse skin. Progress reports indicate that all four produced tumors in some test mice after only 92 days of testing, the company said. Exxon said test results are "consistent with the known carcinogenic potential of high-boiling coal-derived materials." The specific materials being tested are: (1) A distillate, derived from direct liquefaction of Wyoming sub-bituminous coal, using the Exxon donor solvent process. Researchers found one malignant tumor and one benign tumor from among the 50 male test mice exposed to the test sample. (2) A heavy fuel oil derived from direct liquefaction of Illinois bituminous coal using the Exxon donor solvent process. Researchers found two benign tumors from among the 49 surviving male mice. (3) A fuel oil fraction derived from pyrolysis of Arkansas lignite. Researchers found 11 benign tumors and one malignant tumor from among the 12 surviving test mice and one benign tumor from among the 38 mice that died during the test. (4) A fuel oil fraction from gasification of East Texas lignite. Researchers found 18 benign tumors and three malignant tumors from among the 50 mice tested. Exxon said the tested materials were untreated experimental scale products, not finished products.

--Condensed from text

- 1042/79x Electrical Standards; Proposed Rulemaking. Occupational Safety and Health Administration.  
Fed. Reg. 44: 55274-55299, September 25, 1979.

This proposes the amendment of the electrical safety standards in Subpart S of Part 1910. The proposed revision is intended to simplify, clarify, and update those standards. Additionally, the proposal places relevant requirements of the National Electrical Code (NEC) into the text of the regulations, making it unnecessary for employers to refer to the NEC to determine their obligations and unnecessary to continue to incorporate the NEC by reference. The resultant simplification is reflected in the fact that the proposed standard contains less than 10% of the words contained in the currently incorporated NEC.

--Summary

- 1043/79x Smoking History Called of Little Relative Value in Asbestos Risk.  
Occup. Health & Safety Letter 9: 3-4, September 22, 1979.

Dr. Philip E. Enterline, Chairman of the Department of Biostatistics at the University of Pittsburgh Graduate School of Public Health, told the Asbestos Information Association's annual meeting that smoking history is of no relative--and he emphasizes relative--value in determining causes of lung cancer deaths among asbestos workers. The terms are relative, not absolute, since relatively few cigarette smokers die of lung cancer, according to a consensus of statisticians. What Dr. Enterline said was that the risk of lung cancer deaths among asbestos workers who smoke and did not smoke was three times greater than for the general population of comparable demographic values. Thus, whether the risk was 10 vs. 30 for non-smoking non-asbestos workers vs. non-smoking asbestos workers, or 50 vs. 150 for smoking non-asbestos workers or smoking asbestos workers, the relative high risk is three-fold in either case. Dr. Enterline said the evidence also indicated that asbestos was a promoter of a carcinogen already in the body rather than a primary carcinogen itself. That, he said, was in contrast to arsenic, which he declared was a primary carcinogen based on studies of a copper smelter in Washington State.

--Condensed from text

- 1044/79x Consumer Products Containing Asbestos; Advance Notice of Proposed Rulemaking.  
Consumer Product Safety Commission. Fed. Reg. 44: 60057-60061, October 17, 1979.

The Consumer Product Safety Commission is concerned that consumer exposure to asbestos from consumer products may present an unreasonable risk of injury and that some consumer products containing asbestos may present a substantial product hazard. CPSC will begin its formal investigation of the use of asbestos in consumer products by publishing this notice soliciting general information on the use of asbestos in consumer products. In addition to soliciting information on the use of asbestos in consumer products, this notice describes CPSC's proposed regulatory approach to asbestos in consumer products and solicits public comment on the approach. The Commission will consider the comments during the development of any proposed regulation or other remedial action to protect consumers.

--Summary.

- 1045/79x Commercial and Industrial Use of Asbestos Fibers; Advance Notice of Proposed Rulemaking.  
Office of Toxic Substances, Environmental Protection Agency. Fed. Reg. 44: 60061-60068, October 17, 1979.

EPA is concerned that many sources of human exposure to asbestos may present an unreasonable health risk. Exposure to asbestos fibers has been shown to contribute to increased risk of lung damage (asbestosis) and cancer of several anatomic sites in humans. Asbestos is a generic name for several naturally occurring mineral fibers. Since the beginning of the century, approximately 30 million tons of asbestos fibers have been used in the United States to produce thousands of commercial and industrial products. The inventory of asbestos products is growing since products introduced into commerce represent about 750,000 tons of asbestos per year. Some fibers used in these products are inevitably released as a result of fiber processing, product manufacturing, distribution in commerce, product use, and disposal. Much of this asbestos remains in the biosphere as a ubiquitous pollutant because of the fibers' mobility and resistance to chemical and physical decomposition. Humans may be exposed to these fibers from the aforementioned direct and indirect sources. Certain exposures to asbestos are controlled under various Federal and State authorities. However, because of limited mandates (i.e., focused on specific populations or exposure sources), technical difficulties (e.g., available fiber measurement techniques), and other analytical constraints, these authorities are not able to deal with the total asbestos problem. As a result, many population segments remain exposed to, and inadequately protected from both direct and diffuse sources of asbestos. The comprehensive mandate of the TSCA enables EPA to reduce health risk from sources which are difficult to control through media-specific or source-specific regulation authorized under other Federal authorities. Under TSCA, EPA is currently investigating the cumulative effects of exposure to asbestos throughout its life cycle in commercial and industrial products (i.e., from mining and milling through processing, product manufacturing, use and disposal). Their preliminary studies indicate substantial continuing exposure of millions of people to the ever growing inventory of asbestos sources. As a result of this study, the Agency expects to promulgate rules to prevent and reduce any unreasonable risks that are identified.

--Condensed from summary

- 1046/79x OSHA Clarifies Extent of Medical Removal Protection Under its New Lead Standard.  
Technical Notes, Occupational Safety & Health Administration. 1-2, September 25, 1979.

Medical removal protection covers employees who were already temporarily removed from their jobs because of high blood lead levels on and after last March 1, the effective date of OSHA's new lead standard, the agency's officials say. Under medical removal protection in OSHA's new lead standard, workers with high blood lead levels must be placed in other unexposed jobs at no loss in pay, seniority or other employment rights until their blood lead levels fall to acceptable levels. Dr. Bingham said that under the new standard "any employee who was removed prior to March 1, 1979, due to the effects of lead exposure and continues to be so removed on March 1...is entitled for up to 18 months of MRP benefits beginning on March 1, 1979." She said this would be the case whether the employer's removal criteria were equal to or more stringent than the OSHA standard and regardless of what benefits or insurance the employee received prior to March 1. In her letters sent earlier this summer, Dr. Bingham also said: (1) Local and international union representatives, when representing a given group of affected employees for bargaining purposes, are among those authorized to inspect and copy the monitoring and medical removal records required by the standard. She said "the employee representative may himself initiate a request and/or copy such records without prior approval from affected employees" and that "there is no requirement for each individual record to be individually requested." (2) Employers are required to establish and maintain an accurate record for each employee removed from exposure to lead "even though such removals or limitations are not specifically required by the standard."

--Condensed from text

- 1123/79 Mortality of Chrysotile Asbestos Workers at the Balangero Mine, Northern Italy.  
G. F. Rubino, et al. Brit. J. Ind. Med. 36: 187-194, August 1979. 16 refs.

The mortality from 1946 to 1975 of over 900 North Italian chrysotile asbestos workers first employed between 1930 and 1965 has been studied. Nine deaths were certified as attributable to asbestosis, and eleven to lung cancer. One death was attributed to mesothelioma of pleura, but this diagnosis was not supported by histological examination. Comparison with the national figures for all Italy did not reveal an excess of deaths from lung cancer but during the last quinquennium of observation, the SMR for lung cancer rose to 206. Simulation experiments enabled a dust index in fibre/years to be attached to each man in the cohort. All but two of the deaths from lung cancer occurred in the higher exposure group. The relative risk of lung cancer in this group was 2.89. The eleven workers who died from lung cancer were all cigarette smokers. A further period of observation is required to monitor the mortality of the surviving workers.

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- 1124/79 Visceral Pleural Plaque Formation in Asbestosis. A. Solomon, et al.  
Environ. Res. 19: 258-264, August 1979. 8 refs.

Visceral pleural plaques are seldom recorded radiologically in asbestosis. However, the demonstration of calcium in a localized area of interlobar thickening is considered acceptable evidence of a visceral pleural asbestotic plaque. High-kilovolt and xeroradiographic techniques were used in two patients to substantiate the presence of calcium in visceral pleural plaque formation. Autopsy evidence of a plaque was present in a third case.

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- 1125/79 Thickening of Pulmonary Interlobar Fissures: Exposure-Response Relationship in Crocidolite and Amosite Miners. A. Solomon, et al. Brit. J. Ind. Med. 36: 195-198, August 1979. 9 refs.

In a cross-sectional study of all white and mixed-race men employed at South African crocidolite and amosite mines, data on duration of asbestos exposure and radiological findings were available for 1692 men, 94% of the total population. Postero-anterior radiographs were read by three experienced readers. Abnormality was regarded as present if reported by at least two of them. The reading included an assessment of whether interlobar fissures were not visible, were visible but not thickened, or were thickened according to criteria shown in a reference radiograph. Fissures which were visible but not thickened were seen in almost half the men and were not more common in men with longer asbestos exposure. On the other hand, thickened fissures increased in prevalence from about 2% in those who had worked with asbestos for 7 years or less, to 25% in those with more than 15 years' asbestos exposure. Some other asbestos-associated pleural or parenchymal abnormality occurred in 69% of men with thickened fissures. The prevalence of thickened fissures as an isolated abnormality was also related to the duration of asbestos exposure. Because its prevalence is related to duration of exposure, and its recognition is not subject to excessive inter-observer variation, the authors suggest that thickening of the fissures is a valuable sign in the radiological assessment of workers exposed to asbestos.

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- 1126/79 Cyclic Nucleotide Concentrations in Asbestos-Induced Rat Peritoneal Mesothelioma.  
R. H. Stevens, et al. Environ. Res. 19: 442-448, August 1979. 20 refs.

Peritoneal mesotheliomas were induced through the intraperitoneal administration of Rhodesian chrysotile "A" to weanling male Holtzman rats. The intracellular concentrations of adenosine 3',5'-cyclic monophosphate and guanosine 3',5'-cyclic monophosphate were found to be significantly less than the levels measured in comparable control tissues obtained from age-matched animals that had been similarly administered charcoal instead of the asbestos. The calculated molar ratio of cAMP to cGMP was identical in tumors and control tissue implying that the two cyclic nucleotides were diminished by a constant factor in the tumor tissue. However, if tumorigenesis is related to cAMP/cGMP balance within the cancer cell, then in these apparently noninvasive lesions such an equilibrium exists as is found in cells of normal mesentery. These results indicate that asbestos-induced mesotheliomas are similar to other cancerous tissues of the digestive tract in that they contain less of the adenosine cyclic nucleotide than the normal tissue. The findings of this study suggest the possible loss of important cellular regulatory mechanisms in tumors induced by an important environmental carcinogen.

--Authors' abstract reprinted by permission

- 1127/79 Environmental Exposure to Asbestos: A Factor in the Rising Rate of Cancer in the Industrial World? M. R. Becklake. Chest 76: 245-247, September 1979. 17 refs.

Second only to a smoking history, and of comparable importance, an occupational history remains a most powerful, and yet singularly under-utilized tool. Thus, though the present discussion centers on asbestos, it is not inappropriate to remind ourselves as clinicians that there are of the order of 30 other recognized human carcinogens, some of the more common being nickel, arsenic, chrome, uranium and the chlormethyl ethers, all of which may be encountered at the workplace and all of which should be integrated into the physician's schema for a systematic and complete work history. --Condensed from text

- 1128/79 Pneumoconiosis and Chronic Bronchitis in a Group of Cement Workers. P. Maestrelli, et al. Med. Lavoro 70: 195-202, May/June 1979. 16 refs. (Italian).

An examination of 318 cement workers was carried out to evaluate the prevalence rate of pneumoconiosis and chronic bronchitis. In 7.2% of the exposed workers there was radiological evidence of pneumoconiosis; small-irregular opacities were less common than category 2. There were positive cases in all departments, but only in workers with over 10 years exposure. The prevalence rate of chronic bronchitis was related to the job and the length of exposure, taking into account smoking habits. The clinical classification of chronic bronchitis met the criteria of the E.C.C.S. definition. 23.5% of the exposed group gave positive answers to the questionnaire on chronic bronchitis. The respiratory symptoms were related to the job and the length of exposure. In smokers, there was a higher prevalence of chronic bronchitis than in non-smokers. Statistical analysis showed that exposure and smoking habits have a potentiating effect on respiratory tract disease in the more severely exposed group. Functional ventilatory changes were classified as obstructive in type and were well related to the symptoms of chronic bronchitis. --Authors' abstract in English

- 1129/79 Bronchoconstriction in Potroom Workers. M. Saric, et al. Brit. J. Ind. Med. 36: 211-215, August 1979. 19 refs.

The effect on airway responsiveness of an oral dose of a  $\beta$ -adrenergic blocker (80 mg propranolol) given before work, was studied in 15 potroom workers who complained of dyspnoea, chest tightness and wheezing after they had started to work in potrooms. The same study was performed in a group of 10 potroom workers, selected at random, who had not complained of such symptoms. In addition, another group of 12 potroom workers with respiratory symptoms were given 1 mg atropine subcutaneously. Ventilatory function was assessed from forced expiratory curves (by means of a waterless spirometer) and from maximum expiratory flow-volume curves (by means of a digital pneumotachograph). Bronchoconstriction during the first few hours' work was significantly potentiated by propranolol in the group of potroom workers with respiratory complaints. Propranolol did not produce this effect in workers who had not complained of respiratory symptoms. Atropine sulphate abolished the fall in ventilatory volumes which occurred during the first few hours of work. These findings suggest that acute bronchoconstriction, particularly in small airways, and respiratory symptoms occurring in certain potroom workers may be based on an alteration in autonomic balance with vagal preponderance.

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- 1130/79 Acute and Subchronic Inhalation Exposures of Hamsters to Nickel-Enriched Fly Ash. A. P. Wehmer, et al. Environ. Res. 19: 355-370, August 1979. 19 refs.

One 6-hr inhalation exposure of hamsters to Ni-enriched fly ash (NEFA) aerosol (respirable aerosol concentration ~ 200  $\mu\text{g}/\text{liter}$ ) deposited about 80  $\mu\text{g}$  in the deep lung, of which 75  $\mu\text{g}$  was still present 30 days postexposure. The animals tolerated the exposure well during the 30-day postexposure observation period. Two-month exposures of hamsters to NEFA or fly ash (FA) aerosols (~ 185  $\mu\text{g}/\text{liter}$ ) resulted in a deep lung burden of about 5.7 mg, dark discoloration of lungs, heavily dust-laden macrophages, and significantly higher lung weights than in controls, but only minimal inflammatory reaction and no deaths. There was no difference between NEFA and FA effects. The NEFA contained 9% Ni; FA contained 0.03% Ni. The results of this study indicate low acute and subchronic toxicity and slow lung clearance of NEFA and FA.

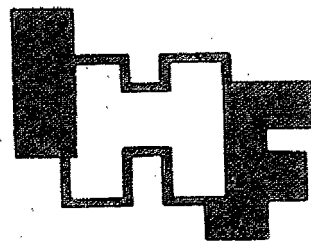
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December 1979  
Volume 43, No. 12

# INDUSTRIAL HYGIENE DIGEST

LITERATURE  
ABSTRACTS

ENVIRONMENTAL  
AND  
OCCUPATIONAL  
HEALTH AND  
SAFETY NEWS



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INDUSTRIAL HYGIENE DIGEST

NEWS ITEMS

- 1166/79x Occupational Safety and Health Standard; Occupational Exposure to Lead; Appendices to Standard.  
Occupational Safety and Health Administration, DOL.  
Fed. Reg. 44: 60980-60995, October 23, 1979.

The new standard for occupational exposure to lead (29 CFR 19.10.1025) published in the Federal register on November 14, 1978 (43 FR 52952), included provisions for appendices to the final regulations. These appendices are now available for publication and for public use. The information provided by these appendices includes substance identification, health hazard information, an employee standard summary, and medical surveillance guidelines which contain detailed discussions of the medical surveillance requirements of the standard, the clinical toxicities of lead, enzymatic pathways in the synthesis of hemoglobin, the adverse health effects on male and female reproductive capacity and on the fetus, and recommended procedures as to medical history, physical examination and laboratory tests. The appendices are intended to provide information and are not intended by themselves to create any additional obligations not otherwise imposed by the standard, nor detract from any obligations in the standard. Use of these appendices as required by the standard shall commence by December 23, 1979.

--Summary

- 1167/79x Asbestos Dangers to Shipyard Workers Will Continue, GAO Report Says.  
Job Safety & Health Report 9: 170, October 23, 1979.

Asbestos hazards experienced by naval shipyard workers will continue for years to come, according to a General Accounting Office report issued October 19 and released by Rep. Glenn Anderson (D.-Calif.), who noted that asbestos use was "a serious matter, a matter of life and death." The GAO report noted that the Navy decided against attempting to remove all asbestos materials from older Navy ships since the cost would be an estimated \$2-billion. "Thus, shipyard employees will continue to work with or near asbestos for many years as ships are repaired and overhauled," the report added. "The Navy has made considerable efforts to protect workers from asbestos, but safe work practices are not always followed." The year-long study conducted for the report focused on the Long Beach Naval Shipyard in California and the Norfolk Naval Shipyard in Virginia. Meanwhile, a Navy seaman in Long Beach charged that enlisted personnel were required to remove asbestos with no protection other than cotton gauze masks.

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- 1168/79x NIOSH Develops Simple Procedure for Detection of Asbestos in Buildings.  
Occup. Safety & Health Reporter 9: 520, November 1, 1979.

An inexpensive screening procedure for the detection of asbestos in the atmosphere of buildings is in the final stages of development, according to Bruce A. Hollett, an industrial hygienist for the National Institute for Occupational Safety and Health. The test, which is a simple colorimetric spot test based upon the formation of color complexes with magnesium and iron released from asbestos, is not specific for asbestos, but does indicate the possibility of its presence, according to Hollett. A sample containing more than 1 percent asbestos gives a positive color reaction, according to test procedures developed by NIOSH researchers Walter S. Kim, James W. Carter II, and Richard E. Kupel. A total of 198 field samples indicated 126 positive and 72 negative results. Later laboratory analysis confirmed the presence of asbestos in 78 of the positive samples, but found no traces in 48 of the positive samples. The laboratory also confirmed the absence of asbestos in the 72 negative samples. Hollett stated that since the laboratory detected no false negative sample results, the screening procedure theoretically could have saved 70 needless laboratory analyses.

--Condensed from text

1169/79x Company Says It Has Developed Asbestos Substitute.  
 Job Safety & Health Report 9: 183, November 6, 1979.

Edwin Neckermann, President of American Fillers and Abrasives, Inc., Bangor, Maine, claims that his firm has developed a non-toxic substitute for asbestos. The product, called Kay-O-Cel, consists of kaolin, clay and cellulose and according to Neckermann, exhibits the same qualities as asbestos without any of the dangers. He claims that Kay-O-Cel can withstand temperatures of up to 1,200° F and that the product makes a good insulator. Although workers are warned not to inhale the new product because that precaution should apply to any finely divided material, Neckermann said there are no indications that the substance is dangerous.

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1170/79x Endangered Species: Small Electroplaters. Industry Week 203: 46, 48, October 15, 1979.

The Environmental Protection Agency admits that the economics of water pollution control may force as many as 20% of the nation's small independent electroplating shops out of business by 1982, the year electroplaters must meet pretreatment standards for discharges into publicly owned treatment systems. EPA published its final pretreatment rules--to control discharges of toxic chemicals--last month. And the National Association of Metal Finishers (NAMF), which has shown little hesitancy in the past about challenging the agency in court, wasted little time in filing a petition for review of the standards in the U.S. Third Circuit Court of Appeals in Philadelphia. Hardest hit by the long-debated and much-criticized standards will be smaller "job shops" employing ten to fifteen workers. Less impact will be felt by printed-circuit-board manufacturers and "captive" shops which perform electroplating as part of the manufacturing process. NAMF legal counsel Theodore Garrett, argues that small-shop owners will be overwhelmed by "fantastic" capital requirements that could range from \$100,000 to \$250,000--outlays that, in many cases, will surpass the total plant investment in small shops. And many urban shops lack the space to install required control technology, he adds. Electroplaters will have three years to achieve the standards, which EPA says will prevent up to 140 million lb a year of toxic substances from entering the nation's public treatment systems and, subsequently, the nation's waterways. EPA granted an exemption for shops discharging less than 10,000 gallons of wastewater per day--requiring them to control only cyanide, cadmium, and lead. Larger dischargers must also limit copper, nickel, zinc, silver, and chromium.

--Condensed from text

1171/79x Proposal Shortens Period for Reporting Job Fatalities (OSHA).  
 Washington Regulatory Report, p. 2, October 31, 1979.

As Occupational Safety and Health Administration rules stand, an employer has 48 hours to report a workplace calamity that results in the death of an employee. If this report is made in writing it may be as long as a week before OSHA is aware of the occurrence. Very often, before OSHA can begin an investigation, both the accident site and memory of those workers involved have changed, making a simple conclusive inspection impossible. But now, in an effort to improve its effectiveness in identifying and controlling the hazards responsible for job fatalities and multiple hospitalization accidents, the Agency has proposed to reduce the allowable reporting time. Under the proposal, an employer would have only 8 hours to notify OSHA of: (1) An accident resulting in the death of one or more employees; (2) An accident resulting in the hospitalization of as many as five or more employees; and (3) The death of a worker occurring within 6 months after an accident and attributable to that mishap. The report could be made orally, or by writing to the nearest OSHA Area Director. A toll free phone number would be established to receive reports during night hours, weekends and holidays. Basically, the report would have to contain an explanation of the circumstances surrounding the accident, the number of deaths and information concerning the severity of any injuries. However, an Area Director could require additional information to be submitted in writing or other manner.

--Condensed from text

- 1266/79 Latency Period for Mesothelioma. A. Chovil and C. Stewart.  
Lancet 2: 853, October 20, 1979. 3 refs.

Some texts and published papers leave the impression that mesothelioma due to asbestos is a tumour that develops in old age, a very long time after exposure. In Ontario this is by no means always true. The Workmen's Compensation Board of Ontario has, since 1970, been compensating cases of mesothelioma attributable to occupational asbestos exposure. Claims have been accepted for 26 cases that had occurred between 1958 and 1978. Most have been workers in industries with high potential exposures, mainly to chrysotile fibres. The age at diagnosis (or death) has ranged from 37 to 78 years with a mean of 56.0. Latency, defined as the period from first known exposure to diagnosis, has ranged from 6 to 44 years with a mean of 26.9 (the authors cannot rule out additional earlier non-occupational exposure). 19 of the cases were pleural in origin and 7 peritoneal. The series is small, but certainly does not fit the textbook picture. Elmes and Simpson have suggested that latency for this tumour may be a function of dose. This may account for the authors' observations.

--Condensed from text

- 1267/79 A Study of Pulmonary Deposition, and the Elimination of Some Constituent Metals from Welding Fume in Laboratory Animals. R. F. Lam, et al.  
Ann. Occup. Hyg. 21(4): 363-373, 1979. 24 refs.

The deposition of particulates from welding fumes produced by two different welding modes (manual arc using flux coated electrodes and automatic metal-inert gas (MIG) using stainless steel wires) has been studied in the rat and guinea pig. The removal of certain metallic components of the fume deposit occurred at different rates, dependent on the 'in vivo' solubility of the specific metal, but common early phase elimination mechanisms were identified for all metals studied.

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- 1268/79 Immunoallergic Shifts in Experimental Animals Exposed to Wool Dust and Its Components. S. S. Baizakova., Gig. Trud. Prof. Zabol. (7): 36-40, 1979. 14 refs. (Russian).

Sensitization to wool dust is mainly attributable to mold fungi and bacteria. In the present experiments on animals immunologic shifts in the leukocytic system under the effect of wool dust and its components occurred before the manifestation of a positive allergic response by the skin, so leukocyte agglomeration tests and leukocytolysis may be suitable for an early detection of dust and microbial allergies. Apart from a specific allergy, animals developed humoral and cellular autosensitization to a homologous pulmonary antigen. Bacteria and fungi caused a more marked autoallergic process than did other dust components. The autoallergic reactions of leukocytes (agglomeration and self-damage) reflected the dynamics of the auto-immune process. Specific immunity processes and autoimmune shifts occurred in the presence of an altered immunobiologic reactivity. At first, during the establishment of specific allergy, the cellular and humoral factors of nonspecific immunity were on the increase; later, with the development of autoimmunization to the pulmonary antigen, the body defenses became progressively weaker.

--Author's summary in English

- 1269/79 Inhibition of Luminol-Dependent Chemiluminescence of Alveolar Macrophages by Possible Etiological Agents of Byssinosis. C. A. Greenblatt and R. L. Ziprin.  
Am. Ind. Hyg. Assn. J. 40: 860-865, October 1979. 16 refs.

Aqueous extracts of cotton bracts inhibited luminol-dependent chemiluminescence of phagocytosing alveolar macrophages. The inhibitory compounds were partitioned into organic solvents. Chromatographic analysis indicated that these compounds were either lacinilene C or its 7-methyl ether and scopoletin. The fact that the inhibitory activity of these compounds was always less than that of the total extract suggests synergistic action. These compounds may function as etiological agents of byssinosis.

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