

FILE NAME: Industrial Hygiene Foundation (IHF)

DATE: 1981

DOC#: IHF111

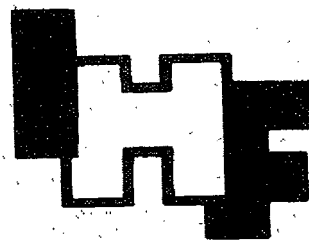
DOCUMENT DESCRIPTION: Industrial Hygiene Digest - 1981 Issues - Covers, TOCs & Abstracts

January 1981
Volume 45, No. 1

INDUSTRIAL HYGIENE DIGEST

LITERATURE
ABSTRACTS

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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.
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January 1981
 Volume 45, No. 1

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interest and major importance in contribution of the life sciences to the future, successful implementation of various fossil energy processes. The authors of the invited papers present current work and recent experimental findings related to the existing understanding of potential impacts and their reduction. The scientist, the engineer, and the decision maker will find this new data and information of direct benefit as program implementation continues, and the summary and discussion included with each session will suggest those areas of continued uncertainty..

--Foreword

22/81x Toxicological Appraisal of Halogenated Aromatic Compounds Following Groundwater Pollution. World Health Organization. Available from: WHO Publications Centre USA, 49 Sheridan Ave., Albany, New York 12210. 58 p. (1980). Price: Sw. fr. 8.--.

During the summer of 1977 well water in part of Vicenza Province, Italy, was found to be contaminated with certain halogenated aromatic compounds. The cause was subsequently shown to be percolation of process residues from an effluent lagoon. This incident provided the immediate stimulus for convening a meeting in Venice in September 1979, of which this publication is the report. While the pollutants in this instance included a variety of α -halogenated chloro- and nitrotoluenes, the episode aroused interest in the possible adverse effects on health of a wider range of single-ring halogenated aromatic compounds. The purpose of the meeting was thus to review available data on the chemistry, environmental occurrence and toxicology of such chemicals, to evaluate the possible health hazards associated with human exposure to them in the environment, and to recommend appropriate guidelines for health protection. As it was not considered advisable to study only the broad categories of substances, a number of important representative chemicals within each group were selected for detailed review. The report begins with a review of the available information on the major uses, environmental occurrence, and toxicological and physicochemical properties of halogenated toluenes, benzenes and anilines, and chlorophenols. Based on these data, an assessment is made of the danger to health of the presence in the environment of these chemicals. The practical aspects of pollution monitoring and control are then discussed, taking into account the fact that some chemicals are easily detected at very low concentrations whereas others, which may occur at much higher concentrations, are more difficult to detect. The Working Group makes a number of conclusions and recommendations, some specific to the pollution incident in Italy and others of a general nature. Annexes to the report give a short account of the incident in Vicenza Province and a model for investigating incidents of groundwater pollution.

--Publisher's release.

23/81x NIOSH Certified Equipment List. National Institute for Occupational Safety and Health. Available from: Publications Dissemination, NIOSH, Robert A. Taft Laboratories, 4676 Columbia Parkway, Cincinnati, Ohio 45226. DHHS (NIOSH) Publication No. 80-144. 139 p. (1980). Single copies available at no charge. Include a self-addressed label with your request.

The National Institute for Occupational Safety and Health, under authorization of the Federal Mine Safety and Health Act of 1977 and the Occupational Safety and Health Act of 1970, provides a testing, approval, and certification program assuring commercial availability of safe personal protective devices and reliable industrial hazard measuring instruments. NIOSH develops improved performance regulations, tests and certifies (or approves) devices, and purchases approved and certified products on the open market to verify the quality of manufacture. This publication (a) lists products certified as of May 1, 1980, (b) contains tables of useful information concerning certified coal mine dust personal sampler units, detector tube units, sound level meter sets, respirators, (c) updates the lists of approval applicants, and (d) provides a list of test procedures for certification of the above products.

--Abstract

INDUSTRIAL MEDICINE

24/81x Occupational Cancer and Carcinogenesis. H. Vainio, et al., eds. J. Toxicol. Environ. Health. 6: 921-1335, Sept./Nov., 1980.

The entire issue is devoted to papers given at an International Course on Occupational Cancer. It will also be issued as a separate book. After an Introduction by the Editors, the Historical Perspectives of Occupational Cancer are discussed by P. Bogovski. The following papers are included: PART ONE: Current Aspects of Cancer Etiology--Importance of Environmental and Occupational Factors in Cancer; J. Higginson; Life-Style in Occupational Cancer, A. M. Adelman; Dietary Components and Cancer, E. Hietanen; Radiation Carcinogenesis, J. Rantanen; Somatic Mutation Theory, M. Sorsa; Heredity of Cancer, J. Rapola; PART TWO: Carcinogenesis at the Molecular Level--Metabolic Activation and Inactivation of Chemical Carcinogens, O. Pelkonen & K. Vahakangas; Alkylation of DNA and Carcinogenicity of N-Nitroso Compounds, R. Montesano, et al.; Binding of Polycyclic Aromatic Hydrocarbons to DNA: Comparison With Mutagenesis and Tumorigenesis, O. Pelkonen, et al.; Asbestos and Metals as Carcinogens, T. Norseth; PART THREE: Detection of Chemical Carcinogens--Identification and Definition of Chemical Carcinogens: Review of Criteria and Research Needs, U. Saffiotti; DNA Replication, Repair, and Repair Tests, B. Lambert; Short-Term Mutagenicity Tests, C. Ramel and U. Rannug;

Cytogenetic Methods in the Detection of Chemical Carcinogens, M. Sorsa; New Concepts of Design and Utility of Large-Scale Carcinogenicity Studies, L. Fishbein; PART FOUR: Epidemiologic Approaches in Carcinogen Detection--Toxicity of Vinyl Chloride and Polyvinyl Chloride as Seen Through Epidemiologic Observations, J. K. Waggoner, et al.; Cancer Registries in the Evaluation of Occupational Cancer, I. Teppo; Transplacental Carcinogens and Mutagens: Childhood Cancer, Malformations, and Abortions as Risk Indicators, K. Hemminki, et al.; Aspects of Confounding and Effect Modification in the Assessment of Occupational Cancer Risk, O. Axelsson; PART FIVE: Risk Branches in Industry--Potential Carcinogenic and Mutagenic Industrial Chemicals. I. Alkylating Agents, L. Fishbein; Chemical Hazards in the Plastics Industry, H. Vainio, et al.; Polycyclic Aromatic Hydrocarbons in Foundries, R. Schimberg, et al.; Epidemiology of Lung Cancer in Foundries, S. Tola; Toxicological Aspects of Chemical Hazards in the Rubber Industry, B. Holmberg & B. Sjostrom; Cancer Risk Among Rubber Workers, M. Hakama & I. Kilpikari; Cancer Hazards Caused by Nickel and Chromium Exposure, T. Norseth; Arsenic Compounds and Cancer, O. Axelsson; Sister Chromatid Exchange and Chromosome Aberrations in Lymphocytes of Laboratory Personnel, B. Lambert & A. Lindblad; Chlorinated Hydrocarbons and Cancer: Epidemiologic Aspects, O. Axelsson; Occupational Cancer of the Urinary Bladder, S. Tola; Asbestos and Cancer in Finland, M. S. Houskonen; Cancer Incidence Among Painters and Some Allied Trades, A. Englund; PART SIX: Risk Assessment--Overview of Some Aspects of Quantitative Risk Assessment, L. Fishbein; The Morals of Risk Assessment, R. I. Yodaiken; Worker Involvement in Risk Assessment, B. Holmberg; The Problem of Extrapolating From Observed Carcinogenic Effects to Estimates of Risk for Exposed Populations, U. Saffiotti; Panel Discussion: Extrapolation From Animal Experiments to Humans, P. Bogovski, et al.

--JFB

25/81 An Occupation and Exposure Linkage System for the Study of Occupational Carcinogenesis. S. K. Hoar, et al. J. Occup. Med. 22: 722-726, Nov., 1980. 23 refs.

Studies of the adverse effects of occupational exposures are most informative when jobs can be classified according to the specific chemical or physical agents involved. However, information sufficiently detailed to permit this is not often available. In such instances a study usually will be based on subjects classified according to industry or task, effectively ignoring the specific agents to which exposure occurred. Such crude classification tends to reduce or obscure associations between specific exposures and disease. In response to this problem, the authors have developed an occupation and exposure linkage system with particular reference to carcinogenesis. Occupations were classified by industry and by task

within the industry. Lists of suspect carcinogens were developed and each suspect carcinogen was linked to industries and tasks in which it has been used. These links make it possible to place in the same exposure category all study subjects whose employment history suggests contact with a particular agent. Epidemiologic analysis then can be based on chemical and physical exposures, rather than on industries or tasks. The linkage system enhances the value of information on occupation obtained from death certificates, cancer registries, medical records, and questionnaires.

--Author's abstract reprinted by permission

26/81x An Epidemiologic Perspective of Environmental Carcinogenesis. K. M. MacLure and B. MacMahon. Epidemiologic Reviews 2: 19-48, 1980. 281 refs.

The purpose of this review is to describe the epidemiologic perspective of environmental cancer today. It begins by offering a brief review of present knowledge of causal relationships in man, drawing attention to unanswered questions. Since the objective is not to review critically the entire body of literature but rather to produce a global view of the subject, frequent reference is made to recent reviews without duplicating their bibliographies. Problems in quantitation that are generic to many exposure-disease relationships are discussed.

--Condensed from text

27/81 Aspecific Bronchial Provocation Tests in Occupational Medicine. G. Moscato, et al. G. Ital. Med. Lavoro 2:(1) 21-26, 1980. 55 refs. (Italian)

Literature reports on the use and the meaning of specific bronchial provocation tests on Occupational Medicine are reviewed. Although to date, limited utilization does not permit a definitive evaluation on their value in prevention, diagnosis and treatment of respiratory occupational diseases, the authors suggest some situations in which aspecific bronchial provocation tests might be useful.

--Author's abstract

28/81 Roentgenologic Determination of Total Lung Capacity. R. D. Miller and K. P. Offord. Mayo Clin. Pro. 55: 694-699, Nov. 1980. 14 refs.

Geometric analysis of the chest roentgenogram allows calculation of estimated gas volume. If roentgenograms are made on individual patients or in epidemiologic studies in which relatively expensive nitrogen meters or body plethysmographs are not available, the thoracic roentgenogram provides an economical alternative. This study compares two roentgenographic methods of estimating total lung capacity in 154 subjects

metabolic activation system. The addition of β -glucuronidase did not enhance the mutagenic effect. The facts that coke plant workers are exposed to very high levels of polycyclic aromatic hydrocarbons (PAH) and that there is no observed enhanced mutagenicity of their urine indicate that the mutagenicity observed with urine from smokers is not due to conventional PAH.

--Authors' abstract reprinted
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68/81 New Approaches to the Establishment of Standards for Harmful Substances in the Air of Work Areas. I. V. Sanotsky and I. P. Ulanova. *Gig. Trud. Prof. Zabol.* (8): 5-8, 1980. (Russian)

The present status of sanitary standardization of toxic substances in the air of work areas is reviewed. Experimental studies have made it possible to formulate fundamentally novel approaches to the setting of two different kinds of MAC (the average MAC for one shift and the highest single-occasion MAC) for these substances showing very marked cumulative properties. The principle of maximum concentration is still valid for certain groups of chemical compounds (irritant substances, substances having strictly directional actions, etc.

--Authors' abstract in
English

INDUSTRIAL DUSTS AND INHALANTS

69/81 Asbestos Disease in Finland. M. S. Huuskonen, et al. *J. Occup. Med.* 22: 751-754, Nov. 1980. 35 refs.

Finland was the world's main producer of anthophyllite asbestos between 1918 and 1975. The total amount of mined anthophyllite asbestos was 350,000 tons of which 230,000 tons were exported. Anthophyllite quarry workers who had worked at least five years between 1936 and 1972 showed the highest risk of asbestosis, in comparison with other groups of asbestos workers.

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70/81 Amosite as a Cause of Lung Cancer and Mesothelioma in Humans. S. F. McCullagh. *J. Soc. Occup. Med.* 30: 153-156, Oct. 1980. 17 refs.

The Advisory Committee on Asbestos has lately recommended that the hygiene standard, or control limit, for amosite should be 0.5 fibres/ml, half the limit recommended for chrysotile. The evidence that would justify different limits for these two types of asbestos, and particularly the evidence upon which the Committee appears most heavily to have relied, is reviewed. It is

concluded that this evidence does not suffice to justify different limits for these two different types of asbestos.

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71/81 Mesothelioma Risks in a Naval Dockyard. G. Sheers and R. M. Coles. *Arch. Environ. Health* 35: 276-282, Oct. 1980. 11 refs.

There have been 108 deaths from mesothelioma of the pleura or peritoneum in Plymouth and the immediate neighborhood as of mid-1978. Ninety-six deaths have been associated with work at the Devonport Dockyard, 53 of which represented men employed at the dockyard in 1966. Occupational mesothelioma rates were similar to those recorded in London asbestos textile workers. Above average rates in this study were observed in ladders, boilermakers, painters, welders and burners, and shipwrights. In addition to mesothelioma in other men with neighborhood exposure at work, cases have occurred in men whose only exposure has been to the environment within the walls of the dockyard, outside ships and workshops where asbestos has been handled. No case has been seen in indoor office workers. There is no evidence of any increase in risk to the population of Plymouth outside the dockyard.

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72/81 A Diagnostic Standard for Pleural Thickening Due to Asbestos Exposure. I. Fuhara and Y. Yamada. *J. Sci. Labour* 56: 529-540, Sept. 1980. 19 refs. (Japanese)

A study was made in order to set up a reasonable diagnostic standard for pleural changes. For this purpose, 502 chest radiographs of people in K-area, where many asbestos workers live, and X-ray films of people in J-area as control were investigated. These X-ray films had been taken for the purpose of health checks of old persons. Radiological pleural changes in the lateral chest near the VIIIth rib on P-A X-ray films should be the most important findings of asbestos exposure. However, increased amount of extra-pleural fat or other soft tissues also might show similar shadows at the similar locality. Accordingly, differentiation between such radiological changes at the site being of asbestos origin or shadows of other soft tissues, was the most important point in setting up a diagnostic standard for pleural thickening due to asbestos exposure. Empirically, it is known that adopting only the radiological pleural changes more than 3 mm in width is suitable for minimizing the false positive or false negative. These results suggest that the diagnostic standard based on width (more than 3 mm), radiological density, density distribution and shape of radiological pleural change is reasonable and acceptable.

--Condensed from abstract in
English

73/81 The Effects of Sampling Practice on the Measured Concentration of Airborne Asbestos. S. T. Beckett. Ann. Occup. Hyg. 23(3): 259-272, 1980. 15 refs.

The effect of variations in sampling practice upon the measurement of airborne amosite and chrysotile asbestos fibre concentrations by the membrane filter method has been investigated experimentally in a laboratory dust chamber and to a lesser extent in industrial situations. The parameters tested were sampling flow rate and volume, the pore size and electrostatic charge of the filter and the angle of inclination of the sampling head. For all types of filter an increase in the sampled volume resulted in a relative lowering of the measured concentration. This was found to be due to an analytical effect and not to changes in sampling efficiency of the filter. The collection of fibres without a sampling flow accounted for 10% of a sample taken at 200 ml min⁻¹. This effect is therefore only relatively important at very low flow rate. Large (8 µm) pore size membrane filters, when sampling amosite at 2 l. min⁻¹, produced a fibre count approximately 15% lower than equivalent measurements on 0.8 µm pore sized filters, although there was no significant fibre penetration completely through this type of filter. Approximately 20% of both amphibole and chrysotile fibres, however, passed through an 8 µm pore size Nuclepore filter at this sampling rate. The electrostatic charge on the filter and the angle of inclination of the sampling head did not appear to significantly affect the measurements.

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74/81 Air Contaminants Encountered by Firefighters. R. D. Treitman, et al. Am. Ind. Hyg. Assn. J. 41: 796-802, Nov. 1980. 17 refs.

The concentrations of eight air contaminants suspected of causing acute and chronic health problems for firefighters were measured in over 200 fires in the City of Boston using a personal air sampler. Threatening concentrations of both carbon monoxide and acrolein were found in a small proportion of the fires. Less hazardous levels of hydrogen chloride, hydrogen cyanide, nitrogen dioxide and carbon dioxide were also noted. Benzene was found in most fires, but at concentrations well below those expected to cause acute injury. The air sampling data have application in treatment of smoke inhalation victims, development of firefighting strategies and selection of respiratory protection devices.

--Authors' abstract reprinted by permission

75/81 On the Role of Autosensitization in the Pathogenesis of Silicosis. E. V. Petrova and G. J. Belobragina. Gig. Trud. Prof. Zabol. (8): 33-35, 1980. 10 refs. (Russian)

Rats exposed to fine quartz dust particles for 9 months developed autosensitization, and it was

shown that neither the initial state of autosensitization nor the reactivity of the body affect the subsequent development of various forms of silicosis. However, there are reasons to believe that the phenomenon of autosensitization is particularly marked in animals with a predominantly nodular type of silicosis.

--Authors' abstract in English

76/81 On the Mechanism of Antisilicotic Action of Glutamic Acid. K. I. Morozova. Gig. Trud. Prof. Zabol. (8): 36-38, 1980. 7 refs. (Russian)

Preincubation of peritoneal macrophages with glutamic acid both *in vitro* and *in vivo* was found to enhance their resistance to the injurious action of quartz dust. One possible mechanism of the anticytotoxic action of glutamic acid may be stimulation of the biosynthesis of adenyl nucleotides with an increase in the ATP/ADP ratio.

--Authors' abstract in English

77/81x A Survey of Occupational Exposure to Man-Made Mineral Fibre Dust. I. W. H. Head and R. M. Wagg. Ann. Occup. Hyg. 23(3): 235-258, 1980. 14 refs.

Occupational exposure to fibrous dust has been studied during the manufacture and use of a wide range of man-made fibres and the results of atmospheric dust sampling are presented. Fibrous materials encountered in the survey included Continuous Filament Glass Fibre, Insulation Wools (Glass Fibre and Mineral Wool), Refractory Fibres and Glass Micro-Fibres. Parallel sampling techniques were used to obtain airborne dust levels in terms of both the gravimetric concentration of total particulate dust and the concentration and size distribution of the fibrous fraction as determined by optical microscopy.

--Authors' abstract reprinted by permission

78/81 Medical Aspects of Silicosis Prevention in Coal Mining (HUNOSA) and its Statistical Evolution. A. H. Lopez. Med. Seg. del Trabajo 27: 29-31, Oct./Dec. 1979 (Spanish)

Changes in the statistics on silicosis in coal mining at HUNOSA are analysed.

--Author's abstract in English

79/81 Occupational Lung Disease in Agate Workers. S. H. Clerk, et al. Industrial Tox. Bull. 3: 1-2, Aug. 1979.

The Industrial Toxicology Research Centre (ITRC), Lucknow (India) conducted a survey of 342 workers engaged in grinding, chipping and drilling of agate stone along with 149 subjects as controls. The objectives of the survey were: (i) to assess the prevalence of lung diseases in agate workers; and (ii) to explore correlation, if any, of the diseases with age, sex, duration of occupational

112/81x Industrial Hygiene Product Data.
National Safety News. Natl. Safety News 122:
100-120, Oct. 1980.

An alphabetical listing of commercially available products and devices with the manufacturers and distributors.

--JFB

113/81 Labor Unions and Accident Prevention: Champion or Adversary? J. E. Aberton. Prof. Safety 25: 19-20, Nov. 1980.

Many labor groups genuinely work with industry to prevent accidents and injuries. Their efforts are equally intensive in the human element as well as the machine and environment elements. But until all labor joins as a champion of safety and accident prevention, no matter where the area of correction is warranted, preventable accidents and injuries with the resulting pain, suffering and financial losses will continue to occur. Labor unions should promote and actively solicit the safety and health of their members. If an industry or employer is not fulfilling obligations to employees, union efforts most certainly should be directed to seeing that these obligations are satisfied. To undermine honest efforts by employers to correct unsafe or careless employees whose own negligence or disregard of rules and regulations has directly led to an accident or injury puts labor unions in opposition to these efforts and is really a disservice to the members they represent.

--Condensed from text

ANALYTICAL METHODS, MISCELLANEOUS

114/81 Organic Contaminants in Direct Coal Liquefaction--A Preliminary Assessment. R. Tanita, et al. Am. Ind. Hyg. Assn. J. 41: 851-853, Nov. 1980. 9 refs.

Area samples taken at two coal liquefaction facilities were analyzed by either gas chromatography or gas chromatography/mass spectrometry to identify the types of organic contaminants to which workers may be exposed. Results indicate that the contaminants consisted primarily of one or two ring low-molecular weight aromatic compounds.

--Authors' abstract reprinted by permission

115/81 The Determination of Arsine in Workplace Air by X-ray Fluorescence Spectrometry. D. J. Keech and N. G. West. Ann. Occup. Hyg. 23(3): 273-282, 1980. 14 refs.

Arsine (AsH_3) is a highly toxic gas which may be evolved accidentally during certain industrial processes; e.g., battery manufacture. The present colorimetric method for the determination of arsine in industrial atmosphere suffers from a

number of limitations which make it unsuitable for monitoring personal exposures. A new method has been developed in which the gas is trapped on a silver nitrate impregnated filter paper, then analysed for arsenic by X-ray fluorescence. This method may be used for the routine monitoring of workers' exposure to arsine down to one-tenth of the TLV (TLV = 0.05 parts/ 10^6 , v/v) on a 15 l. sample.

--Authors' abstract reprinted by permission

116/81 Quantitative X-ray Diffraction Analysis for Airborne Asbestos Dust in the Industrial Environment. I. Application of X-ray Absorption Correction Method. N. Kohyama. Ind. Health 18: 69-87, 1980. 19 refs.

The quantitative analysis of standard asbestos (chrysotile) for airborne asbestos dust in industrial environments was performed by X-ray diffraction technique combined with an X-ray absorption correction method. Through this investigation, it was revealed that airborne asbestos (chrysotile) of 5 to 50 μg per cm^2 mounted on a silver membrane filter could be quantitatively measured with high accuracy when an airborne dust sample contained 1 to 10% of chrysotile (w/w) in any matrix by this correction method. When an airborne dust sample was composed of pure or nearly pure chrysotile, the quantitative analysis could be done up to 5 mg per cm^2 . On the basis of these results, it was concluded that the X-ray absorption correction method is quite useful for determination of airborne asbestos dust in industrial environments and without knowledge of the kind and the percentage of matrix existing in an airborne dust sample, the true weight of chrysotile could be obtained in the range of 5 to 50 μg per cm^2 . By considering that quantitative range, sampling condition, especially sampling air volume, was evaluated. As the diffraction intensity of chrysotile is fairly sensitive to physical and chemical conditions of preparation, a proposal for making a standard sample is also cited.

--Author's abstract reprinted by permission

117/81 Volatile Environmental Pollutants in Biological Matrices with a Headspace Purge Technique. L. C. Michael, et al. Anal. Chem. 52: 1836-1841, Oct. 1980. 29 refs.

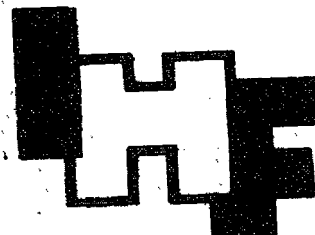
Gas stripping and dynamic headspace analysis were evaluated as methods for purging volatile halogenated organics from human biological samples (urine, blood, milk, and adipose tissue). In gas stripping, volatile compounds are purged by bubbling an inert gas through a liquid sample at elevated temperature. The purged organic materials are trapped on the polymeric sorbent Tenax GC for subsequent gas chromatographic analysis. In dynamic headspace analysis, the gas passes over rather than through the solution. This procedure is particularly applicable to samples which foam, such as biological samples. Vali-

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this notice must be submitted on or before July 30, 1981.

--Summary reprinted

132/81x WHO Group Recommends New Standards for Cadmium, Lead, Manganese, Mercury. Occup. Health & Safety Letter 11: 4-5, January 8, 1981.

A World Health Organization study group concerned with occupational exposure to heavy metals has recommended new standards on cadmium, lead, manganese and mercury. They are: *Cadmium*. A short-term exposure level for cadmium oxide fumes and respirable dust of 250 micrograms Cd/m³ provided the time-weighted average is respected. For long-term exposure, the time-weighted average concentration should be below 20 micrograms and in the present state of knowledge, a tentative value of 10 micrograms/m³ is recommended. For biological limits, a value of 10 micrograms Cd/l of whole blood is proposed as the individual critical level if the exposure is regular and long term. The individual Cd-U concentration should not be allowed to reach 10 micrograms Cd/g creatinine since above this concentration there is some risk of renal dysfunction. *Inorganic Lead*. A health-based biological exposure limit for Pb-B of 400 micrograms/l is recommended for males and for females over the reproductive age. This limit is based on the adverse effects of Pb-B level of females in the reproductive age range should be kept as low as possible and, to protect the fetus, should not exceed 300 micrograms/l. In practice, it said, this recommendation may imply restrictions for women of child-bearing age to work in areas where exposure may cause Pb-B levels to exceed the 300 microgram limit. *Manganese*. On the basis of studies and observations in ferromanganese plants, where workers are exposed to dusts and fumes containing mainly manganese dioxide in particles small enough to reach the alveoli, a value of 0.3 mg of respirable manganese particles per m³ of air (time-weighted average) can be recommended as the health-based limit of occupational exposure. However, the proposed value is tentative in view of the fact that there is a lack of precise information about exposure-effect and exposure-response relationships. *Inorganic Mercury*. For air, 25 micrograms/m³ (time-weighted average); for urine, 50 micrograms/g creatinine (individual levels), for long-term exposure. A range of 200-1000 micrograms/m³ recommended for short-term exposure, but a value of 500 micrograms/m³ is recommended provided the time-weighted average is not exceeded. Owing to the potential fetotoxicity of mercury, the limits are not applicable to women of child-bearing age, whose exposure should be kept as low as possible. Copies of the report, "Recommended Health Based Limits in Occupational Exposure to Heavy Metals, WHO Technical Report Series No. 647, 1980 (ISBN 92 4 120647 0), can be obtained from WHO Publications Centre, USA, 49 Sheridan Avenue, Albany, NY 12210.

--Condensed from text

133/81x Asbestos; Reporting and Recordkeeping Requirements. Environmental Protection Agency. Fed. Reg. 46: 8200-8249, January 26, 1981.

Action: Proposed Rule. This rule, proposed under the authority of section 8(a) of the Toxic Substances Control Act (TSCA), 15 U.S.C. 2607(a), would require reporting to EPA by asbestos manufacturers, importers, and processors. This proposal would require the reporting of quantities of asbestos used in various processes, employee exposure and monitoring data, and waste disposal and pollution control information. Reported information will be considered by EPA in deciding whether and how to regulate asbestos under TSCA. Any company that mines asbestos, imports or processes asbestos fiber or any asbestos-containing product should consider submitting comments. Dates: Written comments on this proposal should be submitted on or before March 27, 1981. Following the written comment period, there will be a 20 day period during which EPA personnel will be available to meet in Washington, D.C. with interested persons.

--Summary reprinted

COMING EVENTS

May 1 National Electrical Code (NFPA-70-78) Changes Workshop. Best Western Thruway House, Albany, N.Y. Write: Ms. Judy Bolton, Div. for Continuing Education, National Fire Protection Association, 470 Atlantic Avenue, Boston, Mass. 02210.

During May this course will be repeated in the following locations:
May 8 Columbus, Ohio - Ohio Fire Academy
May 12 Atlanta, Ga. - Century Center Hotel

May 3 - 5 National Conference on High Blood Pressure Control. The New York Hilton, New York, N.Y. Write: Conference Headquarters, Natl. Conf. on High Blood Pressure Control, 1561 Wilson Blvd., Suite 600, Arlington, Va. 22209.

May 4 - 5 Basic Radiation Hazard Control (Meets licensing requirements.) Holiday Inn, Arlington, Va. Write: International Institute Safety & Health, 9413 Jones Place, Seabrook, Md. 20801.

May 4 - 5 8th International Symposium on Flammability & Fire Retardants. Queen Elizabeth Hotel, Montreal, Quebec. Write: V.M. Bhatnagar, Alena Enterprises of Canada, P.O. Box 1779, Cornwall, Ontario, Canada K6H 5V7.

May 4 - 8 Occupational Respiratory Protection (NIOSH 593). Kansas City, Mo. Write: Ruth K. McIntyre, Director, Continuing Education, Midwest Center for Occupational Health and Safety, 640 Jackson Street, St. Paul, Minn. 55101.

No adverse effects were apparent at 10 or 100 ppm. In the three-generation reproduction study, no adverse effects were apparent on fertility, gestation, viability, lactation, number of still-born, and mean number of pups born and weaned per litter. Adverse effects occurred only on the 640-ppm diet and these consisted of lower weaning weights of offspring and depressed body weight gains of parent rats.

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INDUSTRIAL DUSTS AND INHALANTS

184/81 Asbestos in a Barcelona Fibrocement Factory. F. Segarra, et al. Environ. Res. 23: 292-300, Dec. 1980. 9 refs.

An epidemiological study of the incidence and clinical aspects of asbestosis was carried out in a fibrocement factory located near Barcelona. This is the first study of this nature in Spain. Out of 840 workers 729 were examined, using the following procedures: Medical questionnaire, biotype (weight and height), physical examination, chest radiography (PA and obliques), PFT (static lung volumes, FEV₁, flow-volume curves, Raw, SGaw, DLCO_{SB}), and laboratory procedures (CBC, serum proteins, ANP, RF, asbestos bodies in sputa). Asbestosis was found in 214 workers (approx. 30%). At the initial stages of the disease, pleural involvement appears in the radiological diagnosis earlier and more frequently than parenchymal, 26 and 13%, respectively. There is a well-defined linear relationship between asbestosis incidence and years of exposure: from 0 in the group with less than 5 years of exposure, near 9% in the group with 5-9 years, and up to 69% for those with 30 or more years of exposure. Pulmonary crepitations are the most significant physical finding, observed in one-third of the subjects. The clinical symptoms and the pulmonary function tests suggest beyond doubt a bronchial involvement in asbestosis.

--Authors' abstract reprinted by permission

185/81 Primary Pericardial Mesothelioma E.I. Kahn, et al. Environ. Res. 23: 270-281, Dec. 1980. 26 refs.

An increased incidence of malignancies after exposure to asbestos has been well established. Mesothelioma of pleura, peritoneum, carcinoma of lung, gastrointestinal tract, and possibly of the ovary have been described, as well as cases with multiple primary tumors. On the other hand, an association of asbestos exposure with primary pericardial mesothelioma has not been reported. This paper describes the first case in which such a relationship existed.

--Condensed from Introduction

186/81 Characterizing and Discriminating the Shape of Asbestos Particles. H.G. Siegrist, Jr. and A.G. Wylie. Environ. Res. 23: 348-361, Dec. 1980. 8 refs.

The lengths and widths of approximately 1000 particles from each of four asbestos samples, two nonfibrous amphiboles, and one talc-serpentine sample were measured utilizing the SEM. The asbestos samples are commercially available and include chrysotile from Quebec, chrysotile from California, amosite from South Africa, and crocidolite from South Africa. The tremolite and talc-serpentine are from New York, and the riebeckite is from California. Beneficiation, including milling of amosite, crocidolite, and tremolite and air classifications of the two chrysotile samples, was done under commercial conditions; the riebeckite was milled in the laboratory. For comparison, the same measurements were made on the California chrysotile using TEM. Shape characterizations of the samples are compared using regression techniques. The usefulness of the various shape definitions including length, width, and aspect ratio (length/width) in characterizing and discriminating between samples is explored and evaluated. Significant results include: (I) Frequency distribution of log length, log width, and log aspect ratio show very apparent differences between asbestos and nonasbestos populations. (II) Dimensional differences and accurate classification according to dimensions are enhanced by regressing log width and/or log aspect ratio against log length. (III) Discriminant function analysis is able to quantify the distinction between asbestos and nonasbestos particle dimensions such that over 95% of the population assignments are correct. (IV) Log width is a more efficient classifier than log aspect ratio using either linear regression or discriminant function analysis for these particular samples. (V) The choice of instrumentation, i.e., TEM vs SEM, may affect the sample characterization. (VI) Quantitative descriptions of the dimensions of small particles may be related to the habit of the mineral and the structure of the mineral groups to which the particles belong. However, such mineralogical distinctions are probably not valid for particles whose longest dimension is less than about 1 μ m.

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187/81 Investigation of the Effects of Capacity on Asbestos Vacuum Cleaners. W.L. Johnston and W.J. Loflin. Am. Ind. Hyg. Assn. J. 41: 927-931, Dec. 1980. 11 refs.

Nine industrial vacuum cleaners, designed for collection of asbestos waste, were tested to determine how the performance was affected when the manufacturer's specified capacity was approached, attained, and exceeded. This determination was assessed by measurement of the airborne asbestos fiber concentration in the vacuum cleaner discharge air and the change in vacuum cleaner

suction pressure. Airborne fiber concentrations were found to be far below the present OSHA standard; however, the suction pressure of each vacuum cleaner dropped considerably as the capacity was approached and/or exceeded. All of the units tested except one were able to contain 25% more than their specified capacity without any internal problems, filtering system failure, or total loss of suction pressure.

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188/81 Scanning Electron Microscopy and X-ray Microanalysis of Mineral Deposits in Lungs of a Patient with Pleural Mesothelioma. E.M. Ophus, et al. Brit. J. Ind. Med. 37: 375-381, Nov. 1981. 22 refs.

Scanning electron microscopy of lung tissue, ashed at low temperature, and obtained from an insulation worker who had died of pleural mesothelioma, showed the presence of numerous inorganic particles and fibres. A regional variation in fibre concentration in different tissue samples was found, and the size distribution of naked fibres and asbestos bodies was determined. By energy dispersive X-ray microanalysis the fibres were identified mainly as amphibole asbestos. This method also showed the presence of particles containing titanium and of fragments of diatom shells. Despite a mean concentration of 33×10^6 fibres per gram of dry tissue no significant lung fibrosis was found.

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189/81 Role of Family Susceptibility, Occupational and Family Histories and Individuals' Blood Groups in the Development of Silicosis. M.H. Noweir, et al. Brit. J. Ind. Med. 37: 399-404, Nov. 1980. 21 refs.

A previous investigation has shown that family susceptibility and occupational and family histories have a decisive role in the development of byssinosis among workers exposed to flax dust. Results of investigation of silicosis in 814 male workers exposed to silica-bearing dust showed that family susceptibility has an important role in the development of silicosis among examined workers, and workers whose fathers had an occupational history of exposure to silica-bearing dust were more resistant to the development of the disease than those with non-exposed fathers. The degree of consanguinity of parents and individuals' blood groups also have a role. Workers with cousin parents were relatively highly susceptible to the development of silicosis as well as workers with blood groups "O" or "AB." It has been concluded that the investigated factors might have a role in the development of other occupational diseases and further investigations are indicated.

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190/81 Carbon Monoxide Poisoning Secondary to Inhaling Methylene Chloride. J. Fagan, et al. Brit. Med. J. 281: 1461, Nov. 29, 1980. 5 refs.

Carbon monoxide poisoning usually results from inhaling fumes from engine exhausts, poorly ventilated heating devices, or gas refrigerators. With the advent of natural gas, which is free of carbon monoxide, the risk of accidental poisoning has decreased. The authors report a case of severe carbon monoxide intoxication caused by inhaling methylene chloride from a commercial paint remover.

--Condensed from text

191/81 Effects of Nitrogen Dioxide on Red Blood Cells of Rats: Changes in Components of Red Cell Membranes During *in Vivo* Exposure to NO₂. K. Kaya, et al. Environ. Res. 23: 397-409, Dec. 1980. 25 refs.

Red cell membranes, prepared from red blood cells of rats exposed to 4, 10, or 20 ppm nitrogen dioxide (NO₂) for 1 to 10 days, were examined for evidence of changes in membrane components. Appreciable changes were not found in contents of phospholipid and cholesterol during exposure to 10 ppm NO₂. By contrast, protein content altered with the time of exposure. Moreover, changes in protein composition were observed by employing sodium dodecyl sulfate - polyacrylamide gel electrophoresis. Twenty-four-hour exposure to NO₂ at the concentration above 10 ppm resulted in a marked increase in the percentage of lysophosphatidylethanolamine (LysoPE) to the total phospholipids. The prolonged exposure to 10 ppm NO₂ gave rise to a further increase in LysoPE, whereas the percentage of phosphatidylethanolamine (PE) showed a gradual decrease. A 1-day exposure to 4.0 ppm NO₂ also caused an increase in sialic acid content and decreases in those of PE and hexose. In addition to contents of these components the percentage of LysoPE increased 5 days after exposure and the elevated values were maintained up to the end of exposure period. These results demonstrate that red blood cells in circulation exhibit different membrane properties in terms of lipid and carbohydrate composition during 10 days of exposure to 4.0 ppm NO₂.

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192/81 On the T.R. (total and respirable) Dust Sampler (Report 3). An Experimental Study on a Cotton Dust Sampler. K. Kimura. J. Science Lab. 56: 687-691, Dec. 1980 (Part 1 of 2 parts). 4 refs. (Japanese).

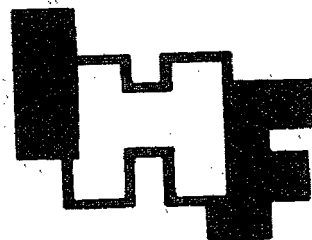
The author designed and tested a method of collecting samples and weighing airborne cotton dust separated into two categories by particle size. The principle and method of sampling with this sampler were described in the previous

March 1981
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INDUSTRIAL HYGIENE DIGEST

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ABSTRACTS

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ENVIRONMENTAL
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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.

March 1981
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the risk of silicosis is very high among workers in this industry. Prevention of this disease will require a concerted effort of government enforcement agencies, workers and management.

--Authors' abstract reprinted by permission

296/81 Problems Deriving from Asbestos Fibres Wetting in Textile Industry. G. Scansetti, et al. *Med. Lavoro* 71: 422-427, Sept/Oct 1980. 15 refs.

Asbestos wetting with mineral oil has been shown to be effective in decreasing fibre concentration in the working environment of the textile industry. In order to evaluate whether this technique is safe the polynuclear aromatic hydrocarbon (PNA) content of this oil was determined. Seven PNAs were identified with HPLC, the whole content of which was approximately 50 ppm. Since an interaction may occur between asbestos and PNAs in producing lung cancer, mineral oils without PNAs should be used for this purpose.

--Authors' summary

297/81 Deposition of Sized Glass Fibres in the Respiratory Tract of the Rat. A. Morgan, et al. *Ann. Occup. Hyg.* 23 (4): 353-366, 1980. 15 refs.

A study has been made of the regional deposition of inhaled glass fibres of discrete size in the respiratory tract of the rat using a radioactive tracer technique. The samples used included four with nominal dia. 1.5 μ m and lengths ranging from 5 to 60 μ m and one with nominal dia. 3 μ m and length 10 μ m. Deposition of the longer 1.5 μ m dia. fibres in the respiratory tract was quantitative as was that of the 3 μ m dia. fibre. Alveolar deposition was much lower than for asbestiform minerals owing to the larger aerodynamic diameters of the samples of glass fibre. It appears that, in the rat, fibres are only respirable when their median aerodynamic diameter is less than 6 μ m. Additional information on the lobar distribution of fibres immediately following administration is provided.

--Authors' abstract reprinted by permission

298/81 Respiratory Disease in a Mushroom Worker. W.M. Johnson and J.G. Kleyn. *J. Occup. Med.* 23: 49-51, Jan. 1981. 28 refs.

A patient with allergic alveolitis demonstrated by lung biopsy is described in a mushroom worker in Washington State presenting with severe airways obstruction. This is the first case of mushroom worker's lung reported in the United States outside the mushroom industry in Pennsylvania. The processes of commercial mushroom

growing are discussed, and the literature on mushroom worker's lung is reviewed.

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299/81 Clearance by the Rat of Inhaled Fly Ash from Fluidized-Bed Coal Combustion. L.C. Griffis, et al. *J. Toxicol. Environ. Health* 7: 117-124, Jan. 1981. 14 refs.

Fly ash from a fluidized-bed coal combustor was neutron-activated and administered to male Fischer 344 rats by a single nose-only inhalation exposure. The activated fly ash contained ^{46}Sc and smaller amounts of other gamma-emitting radionuclides. Whole-body clearance of radioactivity to 127 d was described by an exponential equation, with the long-term component having a biological half-life of 78 d. High resolution gamma spectra of the lungs were obtained with a Ge(Li) detector and the relative activities of several fly ash constituents were compared. The activities of ^{152}Eu , ^{134}Cs , ^{54}Mn , and ^{60}Co significantly decreased with time relative to those of ^{46}Sc and ^{59}Fe . These results indicate that the clearance of fly ash is similar to that of other relatively insoluble particles and that some elements may have been preferentially dissolved from the fly ash particles *in vivo*.

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PHYSICAL HAZARDS

300/81 Elements of Effective Hearing Protection. J.L. Northern. *Plant Eng.* 35: 203-207, Jan. 22, 1981.

An effective hearing protection program requires medical surveillance, personal protective equipment, administrative controls, and engineering controls to provide a cost-effective means for protecting against excessive occupational noise. This comprehensive approach is compatible with long-term goals and includes immediate practical solutions.

--Condensed from text

301/81 An Earplug Insertion and Seating Device. D. Ohlin, et al. *Sound and Vibration* 15: 27-25, Jan. 1981. 10 refs.

Recent studies have shown that insert-type hearing protectors may provide significantly less noise attenuation as they are used in the workplace than that measured in the laboratory. Many factors that include proper fitting and insertion practices, and the overall education and motivation provided by the employer are directly related to the success of a hearing conservation program. Under ideal conditions

dustiness in the various workplaces were considered. Some of these parameters were compared with those obtained in a previous investigation several years before, so as to assess the effect of improvements suggested at the end of the first study.

--Authors' abstract
in English

320/81 Dichloromethane Levels in Air After Application of Paint Removers. R. Otson, et al. *Am. Ind. Hyg. Assn. J.* 42: 56-60, Jan. 1981. 4 refs.

The NIOSH charcoal tube method and a glass bulb grab sampling method were used to determine dichloromethane levels in the air of a room used for testing six paint removers. Dichloromethane and methanol were major components of five brush-on paint removers and an aerosol spray remover contained dichloromethane, toluene, and propane as major constituents. The grab sampling method, which showed sampling efficiency of 95%, precision of better than $\pm 5\%$, and a detection limit of 0.01 g/m^3 , was useful in determining time profiles for dichloromethane levels in air. Since home environment standards have not been established, grab sampling results and TWA (1 and 8 hr) values obtained by the NIOSH method were compared with the occupational exposure limits recommended by NIOSH and ACGIH. In a room with poor ventilation, the recommended occupational health limits can easily be exceeded, even with use of small quantities of paint remover.

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OCCUPATIONAL HEALTH MANAGEMENT

321/81 Rating Job Hazards. Anon. *J. Am. Insur.* 56: 23-26, Fall/1980.

Inspecting integrated circuits in an electronics plant is perhaps one of the safest jobs in industry. Riveting girders on the 40th floor of a skyscraper is one of the most dangerous. Workers in both industries -- electronics and construction -- are covered by a nationwide system of workers compensation which provides benefits for injuries sustained on the job, regardless of the industry or the hazards involved. But how do insurers know where on the scale of risk each type of industry belongs, so they can charge employers the right premiums to cover the expected claims? If there were no uniformity to the process, confusion and unfairness would result. To help solve this problem, the property and casualty insurance industry long ago set up a unique rating system for workers compensation that enables them to measure and insure the injury risks involved in virtually every occupation in the United States. No other line of insurance has such a refined and disciplined way of measuring insurance risk, because workers compensation has a unique blend of

legal requirements, social objectives and competitive demands.

--Condensed from text

SAFETY, ACCIDENT PREVENTION

322/81 First Aid: Answering the Call at Work. J. Manuel. *Occup. Health* 32: 573-575, Nov/1980.

The consultative document on first aid at work (Health and Safety Executive, U.K.) proposes changes in first aid courses and recommends more training for occupational first aiders in the hazards of their industry. The author, Central Electricity Generating Board's Midland region nursing officer, describes a programme of training introduced 10 years ago to meet the needs of small working groups in an around-the-clock industry.

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ANALYTICAL METHODS, MISCELLANEOUS

323/81 On the Determination of Crystalline Silica in the Presence of Amorphous Silica. E. Bye, et al. *Ann. Occup. Hyg.* 23 (4): 329-334, 1980. 4 refs.

The infrared spectroscopic and X-ray diffraction techniques of analysing silica are compared. It is shown, contrary to the *NIOSH Manual*, that amorphous silica interferes in the infrared analyses of crystalline silica. Accordingly, it is necessary to analyse mixtures of the two by means of X-ray diffraction in order to obtain crystalline silica contents.

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324/81 A Routine for the Control of the Performance of Microscopists Evaluating Airborne Asbestos Fibre samples on Membrane Filters by Phase Contrast Microscopy. J.R. Hayes and R. Clayton. *Ann. Occup. Hyg.* 23 (4): 381-401, 1980. 9 refs.

By the use of slide circulations within a laboratory with slides of sufficient density to keep the Poisson error low and re-instruction as required, the relative performance of a team of membrane filter counters has been controlled such that 88% of results obtained for performance checking purposes were within $\pm 30\%$ of the laboratory mean over the period November 1977 - March 1980. Analysis of the results obtained indicates that the inherent standard deviation of the results from a counter is typically 16%. The slides circulated were prepared by the acetone-triacetin mounting method. There is no conclusive evidence from the data presented that during the period mentioned the slides have deteriorated.

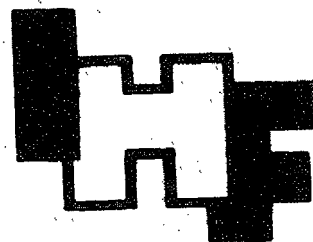
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April 1981
Volume 45, No. 4

INDUSTRIAL HYGIENE DIGEST

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personal history data, physical examination, and laboratory tests (red cell and leukocyte count; determination of haemoglobin, packed cell volume, bilirubin, serum protein electrophoretic fractions, pseudocholinesterase, AST, ALT, GGT, and OCT). Fifteen workers were found to have skin diseases -- chloracne (4), folliculitis (4), oil dermatitis (1), juvenile acne (1), and dermatitis due to irritative or allergic agents (5). Sixteen workers showed more or less pronounced hepatic involvement, consisting most often of hepatomegaly with an increase in serum GGT, AST, ALT, and OCT values. In two workers bleeding cavernous haemangiomas were discovered, in one case associated with chronic myelocytic leukaemia. All the workers with chloracne were employed on electric capacitor impregnation with PCBs, and no definite association was found between chloracne and blood PCB concentrations. Conversely, a significant positive association was found between the abnormal liver findings and blood PCB concentrations, particularly tri-chlorobiphenyl blood concentrations. The abnormal hepatic findings observed are similar to those reported in experimental animals given PCBs, and in some workers such findings should probably be considered as clinical signs of hepatic microsomal enzyme induction.

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405/81 Styrene Exposure in the Fiberglass
Fabrication Industry in Washington State.

R.L. Schumacher, et al. Am. Ind. Hyg. Assn. J. 42: 143-149, Feb. 1981. 17 refs.

A study was undertaken to identify methods used by the fiberglass fabrication industry in Washington State to reduce worker exposure to styrene vapor. All plants in Washington were surveyed to determine the number of employees, number of exposed employees, degree of exposure, amount of raw material used, type of engineering controls, effectiveness of engineering controls, and respiratory protection practices including personal protection. Data were collected during walk-through and sampling surveys to study approaches of industries of different sizes to the control of employee exposure to styrene vapor. There were approximately 1000 exposed employees in 31 plants with a total employment of 4300. Most plants were involved in boat building and repair, an industry with the highest exposure. In 12 selected plants a total of 592 air samples was collected. Approximately 40% of all samples indicated overexposure.

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INDUSTRIAL DUSTS AND INHALANTS

406/81 Comparative Pulmonary Responses to Inhaled Inorganic Fibers with Asbestos and Fiberglass. K.P. Lee, et al. Environ. Res. 24: 167-191, Feb. 1981. 27 refs.

One group of rats, hamsters, and guinea pigs was exposed to amosite asbestos by inhalation of fibers of lengths greater than 5 μ m at 3.1×10^6 /liter, fiberglass at 0.7×10^6 /liter, potassium octatitanate (Fybex, Du Pont's registered trademark for inorganic reinforcing titanate fibers) at 2.9×10^6 /liter, and pigmentary potassium titanate (PKT) at 2.0×10^6 /liter, respectively, for 6 hr/day for 3 months. One group of animals exposed to air alone was used as control. In addition, three groups of rats, hamsters, and guinea pigs were exposed to Fybex at 2.9×10^6 /liter, 13.5×10^6 /liter, and 41.8×10^6 /liter, respectively, for 3 months. One group served as control. Asbestos, Fybex, and PKT produced essentially similar pulmonary responses but with marked differences in fibrogenicity and species differences. Asbestos was the most potent fibrogenic agent and was more than 10 times more fibrogenic than Fybex in terms of exposure concentration. Dose-related fibrogenic activity was found in the animals exposed to Fybex. PKT was the least fibrogenic and produced very minute pulmonary fibrosis in rats and hamsters but not in guinea pigs. Fine fiberglass particles were not fibrogenic. Rats revealed more fibrogenic pulmonary reactions than guinea pigs or hamsters. A few pulmonary tumors developed in animals exposed to asbestos, Fybex, and fiberglass, but their numbers were too small to allow any conclusions on carcinogenicity to be drawn. Fybex produced mesotheliomas in a few hamsters and its possible carcinogenic potential cannot be ruled out.

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407/81 Haemodynamic Study of Pulmonary Circulation in Workers with Asbestosis with Varying Degrees of Radiological Evidence of Pneumoconiosis. M. Tomasini, et al. Med. Lavoro 71: 513-521, Nov/Dec 1980. 8 refs (Italian).

Pulmonary haemodynamics were studied in 16 workers with asbestosis divided into 3 classes according to the degree of radiological evidence. The study consisted of microcatheterization at rest and during exercise on a cycle ergometer. A pulmonary arterial hypertension was observed which was related to an increase in total pulmonary resistance and which was more evident during exercise. The hypertension could be observed even in rather early stages of pneumoconiosis and sometimes in the absence of evident alterations in lung function.

partially reduce the increase in both pulmonary arterial pressure and total pulmonary resistance. The Authors conclude that the pathogenesis of pulmonary circulation impairment can be attributed to a perivascular fibrosis originating in the lymphatic vessels which in asbestosis is particularly early, marked, and diffuse.

--Authors' abstract reprinted
in English

408/81 Asbestos Fibres and the Environment.
D. Gloag. Brit. Med. J. 282: 623-626, Feb. 21,
1981. 31 refs.

The influence of fiber size and shape, asbestos in water, food and the atmosphere and the effects of public policy in Great Britain are discussed briefly.

--JFB

409/81 Asbestos -- Can It Be Used Safely?
D. Gloag. Brit. Med. J. 282: 551-553, Feb. 14,
1981. 23 refs.

A 1977 EEC report concludes that there is "suggestive evidence" from the epidemiological studies for a threshold limit for asbestos exposure below which excess cancer risk is small or non-existent, but that no adequate data to establish such a limit are available. The report adds that for mesothelioma induction the relevant exposure may be impossible to estimate since the peak dust levels are probably important here. However that may be, for chrysotile at low levels the epidemiological data are reassuring; even if, as with many other carcinogens, there is no threshold the diminishing probability of cancer induction must result in exceedingly small risks.

--Condensed from text

410/81 Fibers in Human Lung Dust Samples;
A Scanning Electron Microscope Study. K.H.
Friedrichs and H. Otto. Am. Ind. Hyg. Assn. J.
42: 150-156, Feb. 1981. 4 refs.

Since 1977, mesothelioma has been admitted as an occupational disease in the Federal Republic of Germany, if a previous exposure to asbestos at the working place can be proven. In practical work of pathologists the question arises as to how to proceed in the assessment of necropsy cases of mesothelioma, if the patient's occupational history is unknown. In this study, 100 necropsy cases of different exposure were examined by scanning electron microscopy. Concentration and length of fibers were used as criteria to distinguish between spontaneous and occupationally caused cases of mesothelioma. Calculation of the counting results showed that a distinction between the two groups is reliable when fibers > 5 µm in length are counted.

--Authors' abstract reprinted
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411/81 Health Effect of Diesel Emissions:
A Current Status Report. B. Weisenberger. J. Soc.
Occup. Med. 31: 4-8, Jan. 1981. 9 refs.

Although mutagenic activity has been identified in diesel exhaust, the risk to man is yet to be determined. At the present time there is no evidence to link it to any increase of cancer in man or to any adverse effect on pulmonary function. Risk still remains the unanswered question.

--Condensed from text

412/81 Inhalation of NO₂ and Blood Borne
Cancer Cell Spread to the Lungs. A. Richters and
K. Kuraitis. Arch. Environ. Health 36: 36-39,
Jan/Feb 1981. 7 refs.

An experimental model was designed where the frequency of blood-borne cancer cell metastases to the lungs of animals was used as an indicator to detect adverse effects of inhaled nitrogen dioxide (NO₂). Animals were exposed to air containing 0.40 ± 0.05 ppm or 0.80 ± 0.05 ppm of NO₂. After the appropriate exposure periods, the animals were infused intravenously with B16 rouse melanoma cells. At 3 wk post-infusion the animals were killed and the lungs were examined for melanoma nodule development. The lungs of the NO₂-exposed animals contained a significantly higher number of melanoma nodules than the lungs of control animals (P<.0025). These results indicate that inhalation of ambient or near ambient levels of NO₂ influences the metastasis of blood-borne cancer cells. This raises the possibility that similar events may occur in the human population.

--Authors' abstract

413/81 Effects in the Rat of Inhaling PVC Dust
at the Nuisance Dust Level (10 mg/m³). R.J.
Richards, et al. Arch. Environ. Health 36: 14-19,
Jan/Feb 1981. 13 refs.

Rats inhaled a paste polymer polyvinyl chloride dust at an aerosol concentration of 10 mg/m³ for 6 hr/day, 5 days/wk for a 15-wk period. A small number of randomly scattered lung lesions were detected at 15 wk; these lesions were also present 15 wk after exposure to polyvinyl chloride had ceased. Few if any biochemical changes were detected at the alveolar surface in lung tissues or other organs of polyvinyl chloride-exposed rats. It is therefore concluded that at "nuisance" dust level this form of polyvinyl chloride polymer exhibits a weak biological reactivity.

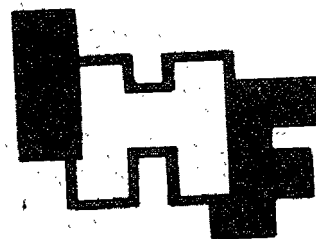
--Authors' abstract

May 1981
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INDUSTRIAL HYGIENE DIGEST

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ENVIRONMENTAL
AND
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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.

May 1981
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Aug. 30 - Sept. 3 QWL and the 80s. An International Conference on the Quality of Working Life. Harbour Castle Hilton Hotel, Toronto, Ontario. Write: *QWL and the 80s, 262 Floor Street West, Toronto, Canada M5S 1V6.*

LEGAL DEVELOPMENTS

464/81x Court Leaves Arsenic Standard in Effect for One-Year Remand Period. Occup. Safety & Health Reporter 10: 1473-1474, April 23, 1981.

The U.S. Court of Appeals for the Ninth Circuit April 7 remanded the inorganic arsenic standard to the Occupational Safety and Health Administration for reconsideration in light of the U.S. Supreme Court's benzene ruling but left the standard in effect for the one-year remand period. The court retained jurisdiction and asked that the amended record be resubmitted to it no later than one year from the date of this order in *ASARCO, Inc. v. OSHA* (No. 78-1959). The arsenic standard, issued by OSHA in May 1978 was challenged by smelting and mining companies and by General Motors and Chrysler Corporation as both too strict and too costly. The current standard for maximum worker exposure to inorganic arsenic is 10 micrograms per cubic meter of air. Several studies presented by OSHA to demonstrate that a serious health risk would result if the current standard were not maintained "suggest caution before subjecting workers unnecessarily to risks we cannot accurately predict," the court said in support of its decision to leave the standard in effect during the remand period. The court also noted that "it is undisputed" that exposure to arsenic at 500 µg/m³ -- which would be permitted if the standard were vacated -- poses a significant health risk. The court rejected the arsenic producers' argument that there would be no risk because of OSHA's power to promulgate emergency temporary standards under Section 6 (c) of the Act. The findings required by that section of the law -- that employees are exposed to grave danger and that the temporary standard is necessary -- appear to the court to be more stringent than those required by the Supreme Court in its benzene decision (8 OSHC 1586). Noting that it had previously granted partial stays of the standard's engineering and work practice controls provision to petitioners ASARCO, Inc., Bunker Hill Company, and Anaconda Company, the court denied Kennecott Copper Corporation's request for a similar stay. "In contrast to the other petitioners, Kennecott Copper has not made representations that it will undertake measures to protect worker health and safety pending a decision," the court said. Kennecott's motion also failed to address the firm's compliance costs, the court noted.

--Condensed from text

465/81x Asbestos Use Can Result in Costly Awards to Employees (OSHA). Washington Regulatory Alert p. 3, April 8, 1981.

A group of 680 former asbestos workers at a New Jersey plant that was closed in 1973 will receive an average of \$13,800 each in a \$9.4 million settlement. While the amount involved is far from a record (a 1978 lawsuit settlement in Texas provided for a \$20 million fund for 445 asbestos workers), it is a sobering reminder of the latent dangers and potential penalties that can result from the industrial use of asbestos. In this connection, industrial users of asbestos should be aware that the Occupational Safety and Health Administration has just revised its instructions to its compliance officers for asbestos-related inspections. These inspections are the basis for determining whether the medical examination programs called for in OSHA's asbestos standard must be initiated. The main effect of OSHA's actions will be to permit inspectors to issue violation citations even when the use of asbestos has been discontinued within the past six months. Inspectors are now instructed that citations for "serious violations" of the standard -- exposure of one or more workers to 0.1 asbestos fibers per cubic centimeter of air, and no existing medical exam program -- can be issued on the basis of largely circumstantial evidence of past practices. In other words, companies that have discontinued the use of asbestos may now be cited for violation of the OSHA standard on the basis of evidence that they violated the standard in the past. It isn't clear how such a citation might be contested by a company that was never previously inspected for asbestos use.

--Condensed from text

466/81x Was Off-Premises Injury Compensable? Occup. Hazards 43: 124, 126-127, April 1981.

Travel to and from his construction company's current job-site tacked 20 miles on Gnewuch's odometer each day. In order to reach the remote site, Gnewuch turned off the main highway onto the sole access route, a rural road which intersected with a railroad crossing. While driving home from work one day, Gnewuch failed to beat an oncoming train over the crossing. The train smashed into his car and injured Gnewuch. When his employer contested Gnewuch's claim for workers' compensation benefits, the case was brought before the Virginia Industrial Commission. At the hearing before the Commission, Gnewuch's employer contended that the claim should be rejected, since Gnewuch's accident had occurred after working hours and outside the workplace. Gnewuch stated that the car accident had been work-related, arguing that since there was only one road leading out of the workplace, his drive home on that road should be considered part of his job. Therefore, the collision with the train was a work-related accident, and the resulting injury was compensable.

microsomal metabolism of biphenyl, benzo(a)pyrene, 4-androstene-3,17-dione and 5 α -androstane-3 α , 17 β -diol in combination with sodium dodecyl sulfate-polyacrylamide gel electrophoresis showed that *n*-hexane was without effect on rat liver microsomal cytochrome P-450 and that methyl ethyl ketone and methylchloroform depressed the formation of two metabolites of androstenedione but did not alter the concentration of cytochrome P-450 under the experimental conditions used. Xylene was shown to be a phenobarbital-like inducer of rat liver microsomal cytochrome P-450.

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INDUSTRIAL DUSTS AND INHALANTS

513/81 Human Response to Controlled Levels of Combinations of Sulfur Dioxide and Inert Dust. I. Andersen, et al. Scand. J. Work Environ. Health 7: 1-7, March 1981. 14 refs.

Under controlled conditions in an environmental chamber 16 healthy young volunteers were exposed to combinations of sulfur dioxide (SO₂) (2.6 or 13 mg/m³) and inert plastic dust (2 or 10 mg/m³) or of SO₂ (13 mg/m³) and dust (10 mg/m³) coated with vanadium. During periods in clean air and during exposures of 5-h duration nasal mucus flow rate, nasal airflow resistance, forced vital capacity, and subjective discomfort were measured. Reductions in nasal mucus flow rate, forced expiratory flow (FEF_{25-75%}), and discomfort were related principally to the SO₂ concentration. The combined effects of SO₂ and dust were, at the most, additive, and there was no indication of potentiation effects. No effect could be attributed to the coating of the dust with vanadium.

--Authors' abstract reprinted
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514/81 A Study of Chromosomal Aberrations in Miners Exposed to Diesel Exhausts. I. Nordenson, et al. Scand. J. Work Environ. Health 7: 14-17, March 1981. 7 refs.

A study was made of chromosomal aberrations in cultured lymphocytes from a group of 14 miners exposed to diesel exhausts and a reference group of office employees and construction workers. No increased frequency of chromosomal aberrations was observed. The frequency of chromosomal aberrations (both gaps and breaks) was, however, found to be associated with smoking.

--Authors' abstract reprinted
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515/81 The Dust of Synthetic Polymers as a Harmful Occupational Allergenic Factor. A.P. Martynova, et al. Gig. Trud. Prof. Zabol. (2): 20-23, 1981. 7 refs. (Russian).

Hygienic, clinical, and experimental studies that revealed allergy-associated hazards of dust from synthetic polymeric materials in industries involving mechanical treatment of these materials, are described. These hazards are due to the allergenic activity of low-molecular mass ingredients and to accessory substances which are used in the manufacture of polymers and which have sensitizing properties.

--Authors' abstract in English

516/81 Use of a Fluorescent Tracer Technique to Study the Botanical Trash Composition of Cotton Dust. P.R. Morey, et al. Am. Ind. Hyg. Assn. J. 42: 239-242, March 1981. 10 refs.

Fluorescently dyed leaf trash of known particle size distribution (X_N =66 μ m) was prepared and blended into raw cotton which was subsequently processed in a model cardroom. The X_N of the added leaf tracer collected in undercard and Pneumafil filter wastes was reduced to 64 and 54 μ m respectively. The X_N of vertically elutriated leaf tracer was somewhat less (3.8 μ m) than the X_N (4.4 μ m) of a small number of potentially respirable particles present in the raw leaf tracer. The fluorescent tracer technique, as applied to carding, offers a direct means of comparing the friability of the different botanical trash components found in raw cotton.

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517/81 Asbestosis and Its Prevention. F.M. Kogan. Gig. Trud. Prof. Zabol. (2): 5-10, 1981 57 refs. (Russian).

Data published in the USSR and elsewhere regarding the risk of asbestosis development among workers in asbestos factories and among those exposed to asbestos in various industries are reviewed, including studies devoted to the clinical features course, roentgen appearances, and functional diagnosis of asbestosis, with particular emphasis on asbestosis complicated by malignant neoplasms and on the possible mechanisms of fibrogenic and carcinogenic actions of asbestos. The main methods of preventing harmful effects of asbestos are reviewed.

--Authors' abstract in English

518/81 Pulmonary Function Status of Workers Exposed to Hardwood or Pine Dust. L.W. Whitehead, et al. Am. Ind. Hyg. Assoc. J. 42: 178-186, March 1981. 28 refs.

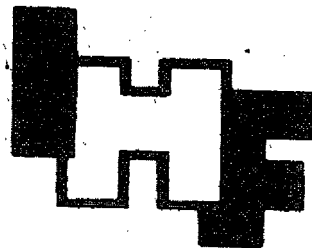
Wood dusts may have substantial health impacts beyond those of nuisance dust. This project reports results linking pulmonary function change

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INDUSTRIAL HYGIENE DIGEST

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

June 1981
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intratracheal instillation of quartz dust and then declined to a lower, but still enhanced, level after 1 week. Increased LDH activity persisted in lavage fluid, alveolar macrophages, and lung homogenates for at least 2 months following administration of quartz. Plasma LDB activity was not affected, however. During the acute phase of the pulmonary response the extracellular LDH activity in the airways was well-correlated with the number of polymorphonuclear leucocytes recovered by lavage. The response of the rat lung to quartz has been shown to be much more complex than indicated by *in vitro* studies and, in particular, alveolar macrophages appear to be much more resistant to the cytotoxic effects of quartz *in vivo* than *in vitro*. The system described may give more reliable information on the cytotoxicity and fibrogenic potential of dusts than any of the *in vitro* test systems presently available.

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622/81 Effect of Chrysotile Asbestos (AP-I) on Sister Chromatid Exchanges in Chinese Hamster Ovary Cells. K.A. Babu, et al. Environ. Res. 24: 325-329, Apr. 1981. 18 refs.

In vitro effect of an Indian variety of chrysotile asbestos from Andhra Pradesh (AP-I) is evaluated using sister chromatid exchanges (SCEs) in Chinese hamster ovary (CHO) cells. Cultures were treated for 24 hr with different concentrations of asbestos fibers, i.e., 0.1, 1, 10, and 100 µg/ml of medium. Sister chromatid exchanges were elevated even with the lowest concentration used. However, the linear relationship between SCEs and asbestos concentration is not seen.

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623/81x The Utilization of the Rabbit Alveolar Macrophage and Chinese Hamster Ovary Cell for Evaluation of the Toxicity of Particulate Materials. I. Model Compounds and Metal-Coated Fly Ash. N.E. Garrett, et al. Environ. Res. 24: 345-365, Apr. 1981. 46 refs.

Data are presented which detail the effects of model particulate compounds and fly ash particles on rabbit alveolar macrophage (RAM) and Chinese hamster ovary (CHO) cells. Silica, silicic acid, titanium dioxide, and size-fractionated (0-2, 2-5, and 5-8 µm) fly ash particles with and without coatings of nickel, lead, or cadmium oxides were the experimental particles. Silica was the most toxic particle studied. Cell viability and ATP in the RAM assay and colony survival in the CHO assay showed an almost identical response to silica and silicic acid. Titanium dioxide particles were relatively inert in the RAM and CHO systems, although a pronounced loss of ATP was observed in cells exposed in serum-free medium. Uncoated fly ash was relatively nontoxic in the

RAM system when assayed by measurement of cell number and viability, ATP, and total protein. However, toxicity of the uncoated particles was demonstrated in the CHO clonal assay. The number of colonies formed at 1000 µg/ml particulate was reduced to 10.6, 28.5, and 82.2% of the control for the 0 to 2-, 2 to 5-, and 5 to 8-µm size ranges. Nickel oxide-coated fly ash was more cytotoxic than the uncoated particles in both the RAM and CHO cell systems. Toxicity of NiO was similar to that obtained for the NiO-coated fly ash although the weight percentage of NiO in the ash was only 3%, suggesting that the particles enhanced toxicity. The lead oxide-coated fly ash was even more toxic than the nickel-coated particles; these particles were used to explore the effect of serum concentration on toxic responses. Cellular ATP was strongly affected in macrophages exposed in serum-free media and treated with PbO-coated fly ash; ATP ranged from 20 to 200 times less than that for the corresponding uncoated fly ash or untreated control. Nickel and lead did not dissociate from the fly ashes into the biological media. However, cadmium was rapidly released from the cadmium oxide-coated fly ash and provided an excellent model for study of the dissociation of toxic compounds from particle cultures. Cell numbers were unaltered after treatment with the CdO-coated fly ash as reported previously for soluble cadmium. The CdO-coated fly ash was considerably more toxic than would have been predicted on the basis of the amount of soluble cadmium released into the medium, also indicating that the association of the metal oxide with the fly ash enhanced toxicity.

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624/81x The Utilization of the Rabbit Alveolar Macrophage and Chinese Hamster Ovary Cell for Evaluation of the Toxicity of Particulate Materials. II. Particles from Coal-Related Processes. N.E. Garrett, et al. Environ. Res. 24: 366-376, Apr. 1981. 17 refs.

Rabbit alveolar macrophage (RAM) and Chinese hamster ovary (CHO) cells were used in *in vitro* tests to evaluate the toxicity of particulate effluents from coal gasification, fluidized-bed combustion, and conventional coal combustion. Evaluation of the cytotoxicity of nine samples from coal energy-related processes showed that the sensitivity of the RAM assay was improved substantially when the test was conducted in serum-free media. A linear relationship was observed between percentage cell viability and ATP level in the particle-treated cultures. In the RAM assay without serum the slope of the line was 1.0, which provided strong evidence that the mechanism of toxicity was similar in reducing cell viability and ATP. The cytotoxicity of the coal-related particles in the CHO clonal assay showed that the system was approximately equivalent to the RAM assay without serum. Conventional coal combustion fly ash (<3 µm) was the

doing specific work and requiring reasonable accommodations in order to perform it effectively.

--Condensed from text

653/81 For 1980: Preliminary Accident Report. Work Deaths Decreased. A.F. Hoskin. Natl. Safety News 123: 69-70, Apr. 1981.

There were about 13,000 deaths from work accidents in 1980, a two percent decrease from the figure recorded for 1979. Of the eight principal industrial groups, one showed an increase, three showed decreases, and the remaining four showed no change in deaths from 1979. The death totals for 1980 were:

Trade	1,400
Service	1,800
Manufacturing	1,700
Government	1,700
Transportation and public utilities	1,500
Construction	2,400
Mining and quarrying	500
Agriculture	2,000

Disabling injuries totaled about 2,200,000 in 1980, and permanent impairment cases numbered approximately 80,000. Incidence rates cannot be computed at this time on a national scale, but preliminary information indicates that the all-industry incidence rate probably showed a small decrease in 1980.

--Author's abstract reprinted

654/81 Systems Safety: A Perspective. R.L. Browning. Prof. Safety 26: 15-19, March 1981.

The author discusses the premises, objectives and techniques of systems safety analysis. The systems safety of the mid-sixties and the traditional discipline, together with the prospects and potentials for systems safety in the eighties, are addressed.

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655/81 Hazard Control System Reliability Evaluation. J.H. Capps. Prof. Safety 26: 20-26, March 1981. 13 refs.

A thorough, consistent conceptual base has not been developed to guide efforts and to facilitate hazard control technology. This article develops such a conceptual base in the hope that others will help in its development; to suggest improvements; to simplify concepts--and most important, to help develop a consensus that a conceptual base is needed.

--Author's abstract reprinted
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656/81 A Safety Program with a Bite. J.L. Wright. Natl. Safety News 123: 64-67, Apr. 1981. 10 refs.

An effective safety program cannot be casual if it is to work year in and year out. Participants must be assigned very specific responsibilities, and must be assisted in upgrading their performance. Finally, performance must be measured in a recognizable manner. Allis-Chalmers Corporation's Engine Division developed a program that includes these three elements. The program is described.

--Condensed from text

ANALYTICAL METHODS, MISCELLANEOUS

657/81 The Dimensions of Airborne Asbestos Fibres--I. Crocidolite from Kuruman Area, Cape Province, South Africa. C.Y. Hwang and G.W. Gibbs. Ann. Occup. Hyg. 24(1): 23-41, 1981. 36 refs.

The dimensions of airborne fibres collected at an underground mine and two mills producing crocidolite in the Kuruman area of Cape Province, South Africa, and those collected at a plant manufacturing pipes in South Africa using Cape crocidolite and chrysotile asbestos are reported. The measurements were made using a transmission electron microscope, a scanning electron microscope and a light optical microscope. There was no apparent changes in diameter with stage of processing although in certain processes, such as cutting asbestos cement pipe, the presence of chrysotile fibres altered the size distribution markedly. However, there was some change in length with stage of processing. The finding that the observed diameter distributions in airborne samples in this study are similar to those previously reported in the lungs of workers exposed to Cape crocidolite may indicate that, if diameter is the important parameter in relation to health effects, the hazard associated with exposure to Cape crocidolite should, dose for dose, be similar for all stages of processing. The proportion of long fibres in the air has been found to be very small and observations on very large numbers of fibres are necessary to confirm their presence.

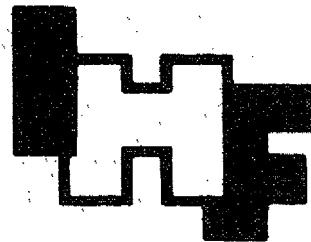
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July 1981
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INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.
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the inhaled air. The rate of CO uptake or elimination is dependent upon the concentration of CO in the air as well as pulmonary diffusion capacity and alveolar ventilation which change with different metabolic rates. Coburn, Forster and Kane (CFK) developed a mathematical model to describe the uptake and elimination kinetics of CO in sedentary individuals. The CFK model was used in a mathematical simulation of CO uptake and elimination where the independent variables were inhaled CO concentration and metabolic rate. The metabolic rate was used to specify pulmonary diffusing capacity and alveolar ventilation. As the level of COHb increased the metabolic rate was decreased to a level compatible with the impaired oxygen transport. A physical fatigue limit was also included. The theoretical model was used to simulate conditions beyond the range of exposures permissible under experimental laboratory conditions.

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726/81 Objective Pathological Diagnosis of Coal Workers' Pneumoconiosis. E. R. Fisher, et al. J. Am. Med. Assn. 245: 1829-1834, May 8, 1981, 28 refs.

Relevant pathological features of lungs obtained at autopsies from 99 coal miners were compared with those observed in the lungs of 268 male town dwellers of comparable age who were not occupationally related to the coal mining or other industries at risk for development of pneumoconiosis. The degree of anthracotic pigment deposition and severity of type of pigmented lesion with its accompanying reticulum fiber formation and fibrosis were significantly greater in lungs of miners. There was a high degree of overlap in degrees of pigment deposition, particularly those quantitated as grades 1 and 2 and in lesions regarded as types 1 and 2. The greatest divergence was observed for prevalence of nodular pulmonary lesions (type 4). There was also a considerable divergence in the type 3 alteration characterized by nonnodular aggregates of carbon-laden macrophages accompanied by minimal reactive fibrosis. It appears that an objective pathological diagnosis of coal workers' pneumoconiosis (CWP) can be rendered only by the demonstration of type 4 lesions. Approximately 25% of coal miners exhibited unequivocal features of CWP. No significant differences concerning incidence or types of emphysema or frequency of chronic cor pulmonale were encountered between the two populations.

--Authors' abstract reprinted
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727/81 Serum Protein Concentrations and Respiratory Tract Abnormalities Following Short-term Exposure To Amosite: A Comparison Between Former Asbestos Workers and Unexposed Controls. D. R. Nash, et al. J. Toxicol. Environ. Health. 7: 733-744, May 1981, 29 refs.

A group of 176 former asbestos workers and 76 unexposed controls of similar age were evaluated and compared for concentrations of serum immunoglobulins, α_1 -antitrypsin, carcinoembryonic antigen (CEA), pulmonary function, radiographic appearance of the lungs, rates, cellular atypia and ferruginous bodies in sputum, and smoking habits. Test subjects were evaluated as a single group and also according to years of exposure to asbestos. Both test and control populations were independently subjected to parametric and non-parametric correlation analyses. Partial correlations were also determined for both groups after controlling for age, race, sex, and smoking habits. Analysis of variance was used to compare test and control groups. Smoking, particularly heavy smoking, was an important variable influencing abnormalities of the respiratory tract and CEA in former asbestos workers but not in controls. Except for immunoglobulin A (IgA), serum proteins, CEA, and α_1 -antitrypsin were not significantly different between test and control subjects. Analysis of variance revealed significant increases between test and control groups for cellular atypia, X-ray abnormalities, rates, and pulmonary restriction. Partial correlation analysis for the asbestos-exposed group revealed important correlations between ferruginous bodies in sputum, rates, and radiographic appearance of the lungs.

--Authors' abstract reprinted
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728/81 Exposure to Chrysotile Asbestos in Friction Materials Industry. G. Scansetti, et al. Med. Lavoro. 72: 46-51, Jan./Feb. 1981, 10 refs.

Cases of asbestosis are frequently observed in friction materials industry, although only chrysotile is used in such manufacturing processes. The results of two subsequent surveys carried out in 1977 and 1979 in a large factory are reported. To determine fibre concentration, samples were taken by membrane filter, and counting was performed by phase contrast microscopy (450 X). 13.5% of samples exceeded 2 f/cc in 1977 as compared to 1.35% in 1979. The improvements derived by machinery enclosure, automation of bag opening, enlargement of ventilation systems and use of ready-mixed batches of asbestos. As it was to be expected, the best results are obtained in final stages of the manufacture.

--Authors' summary.

729/81 Effects of Inhaled Diesel Emissions and Coal Dust in Rats. M. T. Karagianes, et al. Am. Ind. Hyg. Assn. J. 42: 382-391, May 1981, 21 refs.

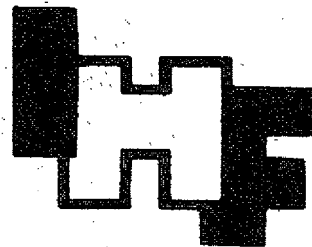
Rats were exposed to coal dust and diesel exhaust emissions, separately and in combination, for 20 months to evaluate the potential health effects of these specific mine air materials. The diesel exhaust was produced by an engine operated in a

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Editor: Jane F. Brislin, M.L.S.
Abstractor: Jean L. Collins, B.A.
Production: Debra A. Bowers, Joy H. Henning

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Mortality and Industrial Hygiene Study of Workers Exposed to Polychlorinated Biphenyls.	--	Abst. No. 835/81
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INDUSTRIAL HYGIENE DIGEST

NEWS ITEMS

762/81x Occupational Exposure to Lead, New Trigger Levels for Medical Removal Protection; Denial of Petitions for Stays; Notice of Variance Applications; Interim Orders. Occupational Safety and Health Administration. Fed. Reg. 46: 37891-37895, July 23, 1981.

Actions: Denial of petitions and notice of variance applications and interim orders. OSHA hereby denies petitions by the primary and secondary lead smelting industries for one-year, industry-wide stays of the new trigger levels for medical removal protection (MRP) under the lead standard (29 CFR 1910.1025(k)). The new triggers thus will take effect for lead smelters on July 21, 1981. OSHA also hereby denies the lead battery manufacturers' petition for reconsideration of OSHA's earlier denial of its request for an industry-wide stay. These actions are taken because data submitted by industry were insufficient to justify granting industry-wide stays. The data did, however, show serious and potentially serious problems of compliance, with the new triggers in certain smelting and battery manufacturing plants. As a result, conditioned upon OSHA receiving by August 3, 1981, for each such plant a variance application, certification of notice to affected employees, and written acceptance of the requirements of the Order, the Agency is granting interim orders under section 6(b)(6)(A) of the OSHA Act to those lead smelting and battery manufacturing plants that have supplied data sufficient to establish the need for relief. The interim orders relieve those facilities from having to comply with the 60/40 removal return triggers, but obligate them to comply with the 70/50 triggers, all other provisions of the lead standard, and certain other requirements set out in the Interim Order. OSHA also invites other eligible lead smelting and battery manufacturing plants, including those that have submitted data but have not been granted an Interim Order via this notice, if they choose, to apply individually for temporary variances. Finally, OSHA requests every applicant to submit particular data needed by the Agency to determine whether to issue a temporary variance, and invites public comment on the variance requests. Dates: The effective date of the new trigger levels (29 CFR 1910.1025(k) originally published on November 14, 1978 at 43 FR 53007) for primary and secondary smelters is July 21, 1981.

--Summary

763/81x Millar Named to Head NIOSH as Agency is Shifted to Atlanta. Job Safety & Health Report. 11: 101, June 30, 1981.

Dr. J. Donald Millar will be the new director of the National Institute for Occupational Safety and Health, effective in July, it was announced June 23 by Dr. Edward N. Brandt, assistant secretary for health and acting surgeon general of the Department of Health and Human Services. The agency also announced that all NIOSH personnel in the Washington area will be transferred to offices in Atlanta and Cincinnati. Approximately 175, mostly unhappy, persons will be involved in the NIOSH move. There are approximately 55 persons in the division of criteria documents who will be sent to Cincinnati and another 120 sent to Atlanta. These include the office of the director, administrative management, legislation, information and grants and contracts offices. NIOSH sources told JS&HR that the move was an attempt to bury NIOSH within the Centers for Disease Control and dilute its power, although the official reason for the move was to "permit greater administrative efficiency." Coincidentally or not, Millar had been offered the NIOSH post in 1978 but had turned it down because he did not want to move from Atlanta, where he has been since 1961. Millar currently heads the Center for Environmental Health at CDC and was the acting director of NIOSH briefly in 1977-78. NIOSH staffers in Rockville, MD., a Washington suburb, are attempting to stop the move with letter-writing campaigns to the governor, senators and representatives in Maryland and to newspapers in Washington, Atlanta and Cincinnati.

--Condensed from Text

764/81x Asbestos Standard Requires Monitoring, Medical Exams, Commission Rules. Occup. Health & Safety Letter 11: 8, July 8, 1981.

The Occupational Safety & Health Review Commission has ruled that the asbestos standard requires periodic employer-provided medical examinations and regular workplace monitoring in any place wherein workers are exposed to measurable concentrations of asbestos. The case involved a Russellville, Ark., nuclear power plant which was inspected by OSHA in 1974 at its construction site. Research-Cottrell, in its construction of cooling towers at the site, used sheets consisting of 25 to 30 percent asbestos to cool the water heated for steam production. After inspecting the site while workers installed

the sheeting, OSHA charged in a non-serious citation that Research-Cottrell failed to monitor the site to determine if asbestos exposure was within the limits set by the standard. The citation also included a charge that the company had not provided medical examinations or made them available to its employees working with the asbestos sheeting as required by the cited standard. Research-Cottrell replied that because previous monitoring at other company locations found asbestos concentrations below limits specified in the standard, it need not monitor the Russellville site. In rejecting this, the Commission said that "the levels of airborne asbestos must be determined on a site-by-site basis... The provisions of the asbestos standard apply whenever employees are exposed to airborne asbestos in measurable concentration." Research-Cottrell also argued that the medical examinations would impose substantial economic burden with negligible worker health value. The Commission reiterated that although an employer may defend against a citation by demonstrating that compliance is impossible, an employer's claim that compliance would be expensive or economically burdensome is not relevant to an employer's obligation to comply, except where feasibility is specifically mentioned in the standard, which the asbestos standard does not.

--Text reprinted

765/81x Genetics Advance Bouys Hopes For Use on Hazardous Wastes. R. Lowenstein. Wall Street J. 198: 29, July 17, 1981.

One way to eliminate industrial pollutants is to create "bugs" that feed on them. So says Ananda Chakrabarty, a genetic engineering specialist at the University of Illinois in Chicago. While working for General Electric Co. in the 1970's, for instance, he developed a microbe that eats its way through crude oil and has the potential to clean up oil spills. Last month Mr. Chakrabarty and his team of Illinois researchers put the finishing touches on a new microbe—one that feeds on a principal component of Agent Orange, the herbicide U.S. troops used to defoliate Vietnamese villages. Mr. Chakrabarty's work puts him at the forefront of genetic engineers designing microbes to clean up spilled chemicals, treat industrial wastes at the source, and, perhaps, remove the danger from herbicides. "In the future," Mr. Chakrabarty says, "instead of banning chemicals (or chemical operations), we'll be able to develop our own antidotes." His latest creation, developed over two years, is a strain of *Pseudomonas cepacia* bacteria that isn't normally found in nature. The bacteria eats 2,4,5-T—itsself a herbicide and a component of Agent Orange—as if it were candy. Drop a little of Mr. Chakrabarty's genetically altered bug into a beaker with 2,4,5-T and the herbicide decomposes into water and carbon dioxide. Natural microbes do that only over very long periods, which is the reason 2,4,5-T remains in fields and ponds for months after a spraying. Scientists differ as to whether 2,4,5-T itself is toxic; they agree, however, that the dioxin found in it is deadly. Mr.

Chakrabarty says his next step is to see whether his microbe decomposes the dioxin as well as 2,4,5-T. Even if it doesn't, he thinks spraying the microbe on contaminated areas would wipe out the persistent 2,4,5-T before it could produce more dioxin—a phenomenon that he says occurs at high temperatures. "He's done two things," says David Watkins of EPA's industrial pollution control division in Cincinnati. "He created an organism that will get rid of 2,4,5-T, and he's developed a technique that could be applied to other potential environmental problems." "I'm optimistic that in a few years genetic engineering will make organisms do things they don't usually do," including treating industrial wastes, says David F. Gibson, professor of microbiology at the University of Texas at Austin. "Of course, we still don't know if organisms (like the one developed by Mr. Chakrabarty) will survive in competition with other organisms when they're taken outside the lab." A potential hurdle, says Mr. Watkins of the EPA, is "the political fear that we have created some kind of monster." He isn't worried about possible side effects and notes that the University of Illinois team "used only mechanisms that nature could have performed under the right circumstances. And Mr. Watkins says that the new bug's diet is also unknown. "We don't know what else it could eat."

--Condensed from text

766/81x Variety of Problems Hurt Usability of Asbestos Encapsulation, May Stall EPA Rule. Job Safety & Health Report. 11: 90, June 16, 1981.

Contrary to hopes and expectations of school districts in the U.S., encapsulation of friable asbestos fibers has only a limited value at present and the method is not a practical option for containing asbestos-containing materials in schools or office buildings that have considerable traffic. The dismaying news became apparent June 8-9 at an Environmental Protection Agency conference on asbestos encapsulants where talks by asbestos researchers frequently highlighted the weaknesses of encapsulation. The news is particularly bad for school staff and maintenance workers because they had looked to encapsulation as a relatively cheap and effective method of containing the dangerous fibers. Encapsulation is cheap to use, but as the conference pointed out, it not only has limited uses, but can also make an asbestos problem worse once the sealant material is applied and then damaged. However, EPA officials and several sealant manufacturers agreed that the encapsulants can work, but that more market research and development is required to improve its reliability. In general, manufacturers pointed out that it is critical to test various sealant mixtures against different asbestos materials. Some will work on certain materials, while they may not work on others. Manufacturers said that their products work, but that many installers do not follow product specifications and incorrectly apply the sealants.

--Text reprinted

789/81x Asbestos Sampling and Analysis. G. S. Rajhans and J. L. Sullivan. Available from: Ann Arbor Science Publishers, Inc., 230 Collingwood, P.O. Box 1425, Ann Arbor, Michigan 48106. 266 p. (1981). Price: \$37.50.

Of all of the problems encountered by industrial hygienists and others concerned with workplace health, asbestos must surely be among the most difficult. It is almost impossible, at present, to decide what a safe concentration is, if such a figure exists, or to unravel current controversies on the mechanisms responsible for its effects. To be sure, a veritable mountain of literature, much of it very recent, exists. Many alternative techniques for the identification of asbestos varieties and airborne fibers have been suggested in the literature. For specialists, these reports are extremely useful, but the average industrial hygienist and associated workers are often unfamiliar with the basic principles of alternative techniques, and may not have ready access to the vast quantity of available literature needed. For this reason, the authors have tried to assemble a representative cross section of current information on the more important methods of asbestos identification and sample evaluation. In doing so, they have described methods now in every-day use, as well as those with which most industrial hygienists and industrial health workers will not be as well acquainted. Accordingly, some explanations of the basics of the techniques employed also have been included. Clearly, there is a limit to the extent that this can be done. It is not possible, nor is it necessary, to describe in their entirety the scientific principles involved. What the authors have tried to do is to present enough information for the average industrial hygienist to begin to understand and use methods such as X-ray diffraction and electron microscopy. In no way is the book written for the specialists in the individual fields. However, if any such are confronted with questions of asbestos evaluation for the first time, the book should be helpful. Certainly, the last words on the subject have not been written. Asbestos analysis and evaluation, as well as interpretation of results, are difficult subjects even for experts. At best, the currently-used techniques or methods involve uncertainties and, at worst, they can be misleading. Unfortunately, the other available methods, though they may be more positive, are unfamiliar to most people in industrial hygiene. They are also time-consuming and expensive. Nevertheless, if more satisfactory approaches are to be developed, some of the less familiar methods will need to become better known.

--Condensed from Preface

790/81x Quantitative Industrial Hygiene. H. J. Beaulieu and R. M. Buchan. Available from: Garland STPM Press, 136 Madison Avenue, New York, N.Y. 10016. 157 p. (1981). Price: \$17.50.

To perform a competent environmental evaluation, the field industrial hygienist must be extremely knowledgeable about his equipment. This laboratory guide was developed to help introduce critical procedures and equipment to students and professional hygienists in a logical, organized, and meaningful way. Enough information about every subject is provided to enable the reader to understand the importance of each testing or analysis procedure and to perform them successfully. In addition, each procedure contains pertinent reference material, equipment lists, and addresses of equipment suppliers. In addition to its importance as a valuable reference tool Quantitative Industrial Hygiene complements available lecture-oriented textbooks and is an ideal lab book for all industrial hygiene courses. Exercises: Calibration of the Wet Test Meter; Calibration of the Totameter and Critical Orifice with the Wet Test Meter and the Bubble Burette; Particulate Sampling by Membrane Filtration for Microscopic Counting; Calibration of the Porton Graticule (in a microscope) and Size Counting Particulates; Mass Respirable and Total Mass Sampling for Particulates; Gas and Vapor Sampling and Analysis; Evaluation of Local Exhaust Ventilation Systems; Heat Stress Evaluations; Noise Evaluations; Illumination Evaluations; Microwave Evaluations; Conducting a Preliminary Industrial Hygiene Survey; Respiratory Protection.

--Publisher's release

791/81x NIOSH Current Intelligence Bulletin 35. Ethylene Oxide (ETO): Evidence of Carcinogenicity. National Institute for Occupational Safety and Health. Available from: Publications Dissemination, NIOSH, 4676 Columbia Parkway, Cincinnati, Ohio 45226. DHHS (NIOSH) Publication No. 81-130. 21 p. (1981). Single copies available at no charge. Include a self-addressed label with your request.

The National Institute for Occupational Safety and Health (NIOSH) recommends that ethylene oxide be regarded in the workplace as a potential occupational carcinogen, and that appropriate controls be used to reduce worker exposure. These recommendations are based primarily on an industry-sponsored study demonstrating that ethylene oxide was associated with increases in leukemia in female rats and peritoneal mesotheliomas (malignant tumors) in male rats. There has been widespread recognition of the mutagenic potential of ethylene oxide, and recent evidence demonstrates adverse reproductive effects in mammals, which also are of public health concern. In addition, limited epidemiologic investigations at two worksites provide evidence that excess risk of cancer mortality may exist for the ethylene oxide workers studied. Some workers are on occasion exposed to relatively high concentrations

mortality due to cirrhosis of the liver was also elevated. The results of detailed industrial hygiene surveys conducted in each plant are also presented.

--Authors' abstract

836/81 Paraquat Poisoning and Kidney Function Tests. D. B. Webb and C. G. Davies. *Lancet.* 1: 1424, June 27, 1981.

Publications on paraquat poisoning are now emphasising the renal handling of this compound. Paraquat is renally excreted and renal failure will promote sustained tissue levels and thus encourage pulmonary uptake. Paraquat is an organic base and the existence of active secretion by organic base transport is supported by infusion studies with other organic bases which inhibit paraquat secretion. The degree to which paraquat clearance will exceed glomerular filtration rate expressed as creatinine clearance must be interpreted with caution, however.

--Condensed from text

INDUSTRIAL DUSTS & INHALANTS

837/81 Consideration of the Aerodynamic Equivalent Diameter of Respirable Mineral Fibers. P. Gross. *Am. Ind. Hyg. Assn. J.* 42: 449-452, June 1981, 3 refs.

By means of data derived from the work of others, the relation of the diameter and length of a fiber to its aerodynamic equivalent diameter is portrayed graphically. Similarly, graphical representations of the relationship of fiber diameter and length to alveolar deposition are constructed and discussed.

--Author's abstract reprinted by permission

838/81 Fiber Toxicology. J. P. Leineweber. *J. Occup. Med.* 23: 431-434, June 1981, 17 refs.

It is beyond our normal experience to comprehend how a very durable, non-reactive material such as asbestos can play a role in the complex biological process that leads to malignant growth. The objectives of this discussion are to show that the factors involved can be reduced to three major determinants and to consider how these determinants can be used to evaluate the possible risk associated with occupational exposure to a wide variety of fibrous materials, both natural and man-made. Our current knowledge regarding asbestos-related diseases has been derived from both epidemiological and animal studies. In certain limited areas confirmatory evidence has been obtained from in-vitro cell culture studies. All of this information indicates that the important determinants for the biological activity, and, therefore, the disease-producing potential, of

fibers are the dimensions of the fibers, the dose and the durability of the fibers in the biological system.

--Condensed from text

839/81 Pleural Plaques and Cigarette Smoking in Asbestos Workers. W. Weiss, et al. *J. Occup. Med.* 23: 427-430, June 1981, 11 refs.

In a survey of 45 men aged 40 or over who had worked five years or more in an asbestos manufacturing plant, the prevalence of pleural plaques was studied with respect to age, duration of asbestos exposure, estimated cumulative asbestos dose, and smoking habit. Plaques were found in 38% to 53% of the men, depending on the interpretation of the chest film reader. Cigarette habit appeared to be the most important factor; the prevalence was lowest in non-smokers, intermediate in current smokers, and particularly high in exsmokers. There was some confounding of this relationship by estimated cumulative asbestos dose but such confounding did not seem to be sufficient to explain fully the relationship between the prevalence of plaques and smoking habit. Both factors must be considered in studies of the risk of pleural plaques in asbestos workers.

--Authors' abstract reprinted by permission

840/81 Mortality of Workers Certified by Pneumoconiosis Medical Panels as Having Asbestosis. G. Berry. *Brit. J. Ind. Med.* 38: 130-132, May 1981, 12 refs.

A mortality study has been carried out at the London, Cardiff, or Swansea Pneumoconiosis Medical Panels between 1952 and 1976 on people certified as suffering from asbestosis. The main analysis was of 665 men, 283 of whom had died. Of the deaths, 39% were from lung cancer, 9% mesothelioma, and 20% asbestosis. The observed mortality was compared with expectation based on the death rates for England and Wales. For all causes the observed number of deaths was 2.6 times expectation and for lung cancer 9.1 times expectation. After 10 years from first certification half of the men had died compared with an expectation of one in four. The excess death rates were apparent in the first year after certification and were still operating after 10 years on those who survived until then. The main factor influencing the mortality was the clinical state of the men at the time of certification, as indicated by the percentage disability awarded; the excess lung cancer rate and the mesothelioma and asbestosis rates all increased with percentage disability. Those awarded only 10% or 20% benefit were still at risk from all the three asbestos related causes. For a man certified at age 55 it was estimated that his life expectation would be reduced by 3, 5, 8, or 12 years according to whether his rate of disablement benefit was 10%, 20%, 30% or 40%, or 50% or more respectively.

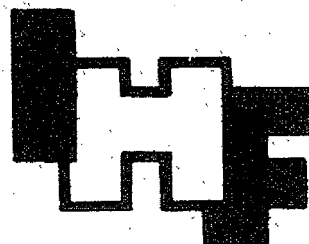
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September 1981
Volume 45, No. 9

INDUSTRIAL HYGIENE DIGEST

LITERATURE
ABSTRACTS

ENVIRONMENTAL
AND
OCCUPATIONAL
HEALTH AND
SAFETY NEWS



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INDUSTRIAL HYGIENE DIGEST

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September 1981
Volume 45, No. 9

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fitness, strength, workplace layout, load handles, etc.). The Guide includes recommendations regarding both the selection and training of workers who must perform manual materials handling activities as well as presenting some engineering guidelines for the design of workplaces where manual materials handling is performed.

--Abstract

INDUSTRIAL MEDICINE

915/81 Occupational Lung Diseases. State of the Art. H. Weill. Chest. 80: 54S-57S, July 1981, Supplement, 13 refs.

Gaining access to occupational groups requires convincing both management (and their lawyers), as well as workers (and their unions) that even in this somewhat polarized, regulated and litigious society, it is in their self-interest to participate in such investigations. In this overview, the author summarizes several examples of how studies of populations exposed to mineral and organic dusts, or chemical gases and vapors, have contributed to our knowledge of both dose-related and non-dose-related determinants of these conditions, and raise some of the questions which remain.

--Author's summary condensed

916/81 A Method for Detecting a Cohort Exposure. S. T. Sacks, and S. Selvin. Environ. Res. 25: 167-177, June 1981, 17 refs.

Until recently cohort analysis has been primarily a descriptive technique using graphical presentations to identify obvious cohort effects. The present paper discusses methodology designed to separate and statistically assess the individual influences on disease rates of birth cohort, calendar time, and age (and includes several examples of cohort analysis on both actual and hypothetical data). Analyzing a set of data for a cohort effect for the purpose of identifying point source exposures is emphasized.

--Authors' abstract reprinted by permission

917/81 Preemployment Back X-Rays--An Unnecessary Practice: Try Another Approach! R. J. Ustby. Occup. Health Nursing. 29: 20-23, July 1981, 10 refs.

Preemployment x-rays do not predict future low back pain or injuries. Furthermore, the x-rays unnecessarily expose the employees to radiation and are expensive. Refusing employment to someone on the basis of preemployment back x-ray may bar desirable employees from the workforce and expose employers to legal liabilities. A complete history and physical examination in conjunction with a screening test of back strength and flexibility provide basic components for a useful inexpensive preemployment examination.

--Summary

918/81 Developing Job-Related Preplacement Medical Examinations. J. C. Hogan, and E. J. Bernacki. J. Occup. Med. 23: 469-475, July 1981, 20 refs.

Federal regulations prohibiting discrimination in hiring require that employment selection procedures to evaluate applicants be based on job-related criteria. The preplacement physical examination used in employment, particularly in the placement of handicapped persons, must also be conducted in a job-related manner. This paper discusses the development and use of the physical examination in selecting and placing applicants for jobs in the workplace with special reference to handicapped persons and disabled veterans. It presents and justifies a method of performing these examinations in a manner consistent with humanistic and business goals as well as the goals of federal regulatory agencies prohibiting employment discrimination.

--Authors' abstract reprinted by permission

919/81 Editorial Response: Preplacement Examination. S. Lerner. J. Occup. Med. 23: 475-476, July 1981.

In this editorial response to Hogan and Bernacki's article, "Developing Job-Related Preplacement Medical Examinations," (See abstract 918/81) Sidney Lerner adds some pertinent personal observations and includes a suggested "Report of Medical Examination" form to replace the form used by the other doctors in their article.

--JLC

920/81 Epidemiology, Public Health and Health Surveillance Around Point Sources of Pollution. J. H. Stebbings, Jr. Environ. Res. 25: 1-7, June 1981, 10 refs.

In industrial society a large number of point sources of pollution exist, such as chemical plants, smelters, and nuclear power plants. Public concern has forced the practising epidemiologist to undertake health surveillance of the usually small populations living around point sources. Although not justifiable as research, such epidemiologic surveillance activities are becoming a routine part of public health practice, and this trend will continue. This introduction reviews concepts of epidemiologic surveillance, and institutional problems relating to the quality of such applied research.

--Author's abstract reprinted by permission

921/81 Medical Surveillance--A Way To Go. F. Ebert. Occup. Health Nursing. 29: 9-16, July 1981, 5 refs.

The forms and procedures established for a medical surveillance program for employees involved in asbestos demolition are summarized.

--JFB

In addition to examining the liver by an electron-microscope, Cd concentration in the liver was analyzed by atomic absorption spectrophotometry. The Cd contents in the livers of group III were significantly reduced compared with those of group I. Apparent ultrastructural changes; i.e., deterioration of rough endoplasmic reticula, losses of glycogen particles, and proliferation of smooth endoplasmic reticula, were observed in the livers of group I. Meanwhile, these changes were significantly mild in those of group III. From these results, it is suggested that Cd inhibits protein synthesis and glycogen metabolism in the liver, and that Zn partly protects the liver from Cd-induced ultrastructural changes.

--Authors' abstract in English

956/81 Contribution of the Study of Long-Term Effects of Polyneuropathy due to Industrial Glues. Clinical and Electromyographic Observations. V. Montesanti, and N. Liso. *Med. Lavoro.* 72: 107-112, March/April 1981, 7 refs. (Italian).

The Authors describe clinical and electromyographical reports taken over a period of time (from a minimum of 1 year to a maximum of 6 years) for 10 patients who had contracted polyneuropathy due to exposure to industrial adhesive substances between 1971 and 1976. The data emerging from these observations lead the Authors to conclude that patients recover within a period of 16-18 months without clinically appreciable neurological consequences, while electromyographical alterations tend to take a longer period of time to normalise, and in any case no less than 24 months.

--Abstract in English

957/81 On the Neurotoxicity of Cyclohexanol and Cyclohexanone. L. Perbellini, et al. *Med. Lavoro.* 72: 102-106, March/April 1981, 15 refs. (Italian).

The occurrence of peripheral neuropathies in animals and humans exposed to cyclohexane or cyclohexanone has been suspected. This study reports the results obtained from rats which received twice daily i.p. injections each containing 200 mg/kg of cyclohexanol, 5 days a week for periods up to 6 weeks, and from rats which received the same dose of cyclohexanone for periods up to 13 weeks. The electrophysiological and neuropathological studies during and after the treatment failed to detect any damages of the peripheral nervous system. These results suggest that the chronic intoxication with the main cyclohexane metabolites, cyclohexanol and cyclohexanone, do not develop peripheral neuropathies in rats.

--Authors' abstract in English

INDUSTRIAL DUSTS AND INHALANTS

958/81 NRC Report Discusses Health Effects Of Exposure to Diesel Engine Exhaust. Anon. *J. Air Poll. Control Assn.* 31: 790-791, July 1981.

According to the 1981 Report of the Health Effects Panel of the National Research Council's Diesel Impacts Study Committee, the effects of human exposure to whole diesel exhaust have not been conclusively demonstrated. From available epidemiological, clinical, and laboratory animal studies, no firm conclusions can be drawn about possible pulmonary and systemic effects of diesel exhaust exposure. Although a comparatively large data base exists for pulmonary and systemic effects of certain individual gas-phase exhaust components--e.g., nitrogen oxides--there is little basis for making judgments on the cardiopulmonary effects of whole diesel exhaust--even though some of the individual components are known to exert adverse effects. However, evidence based on laboratory animal studies suggests that inhaled diesel exhaust affects the lung clearance mechanisms, produces non-specific histopathologic changes in the lung that may or may not be reversible, and adversely affects the pulmonary defense mechanisms.

--Condensed from text

959/81 Methodological Problems in Ecologic Studies of the Asbestos-Cancer Relationship. S. Graham. *Environ. Res.* 25: 35-49, June 1981, 14 refs.

Past researchers dealing with worker populations and, rarely, populations residing around sites where asbestos is mined or manufactured, have shown a relationship between such exposure and mesothelioma. These studies have dealt mainly with males, and have not replicated those findings in a couple of studies that asbestos increased risk of lung, stomach, and large bowel cancer. In order to extend the knowledge of the effects of asbestos further and to consider another type of exposure, residential, the authors examined the incidence of all sites of cancer, studied separately, in the asbestos-mining counties of Quebec, the first-ring counties surrounding them, the other rural counties, and the urban counties of Quebec. As have previous studies, they found higher risks of mesothelial tumors, and in addition, an added risk for cancer of the lip, salivary gland, and small intestine for males. The females showed higher risk for cancer of the pleura, lip, kidney, salivary gland, and melanoma. Risks increased in a dose-response fashion with an increase in proximity to the mines. The authors caution that these findings are limited by deriving from an ecological design, and that cancers appearing now are probably the result of a long latent period, during which time the kinds of exposures may have changed markedly because of changes in mining techniques and air pollution controls.

--Author's abstract reprinted by permission

960/81 Asbestos Inhalation and the Induction of Splenic Lymphocytic Proliferation in the Rat. E. Kagan, and K. Miller. Chest. 80: 11S-12S, July 1981, Supplement, 7 refs.

There is evidence that the alveolar macrophage plays a critical role in the pathogenesis of asbestosis, since this phagocytic cell is an important component of evolving lesions in this disease. The authors recently demonstrated that alveolar macrophages obtained from asbestos-exposed rats can evoke a stabilized physical interaction during *in vitro* culture with autologous T cell-enriched splenic lymphocytes. This interaction was shown to have two components: an effect analogous to that produced by subjecting macrophages to the peroxidant action of sodium metaperiodate (NaIO_4) and an effect which was similar to antigen-directed clustering of lymphocytes around macrophages. As an extension of the previous study they now report that alveolar macrophages obtained from asbestos-exposed rats can initiate a vigorous *in vitro* splenic lymphocyte proliferative response.

--Condensed from text

961/81 Asbestos Stimulates Alveolar Macrophages to Release a Factor Causing Human Lung Fibroblasts to Replicate. P. Bitterman, et al. Chest. 80: 38S-39S, July 1981, Supplement.

Asbestosis is a form of interstitial pulmonary fibrosis resulting from the inhalation of asbestos fibers. One of the characteristic morphologic findings in asbestosis is asbestos fibers engulfed by pulmonary alveolar macrophages (PAM) surrounded by clusters of lung fibroblasts. The role alveolar macrophages play in the formation of these fibroblast clusters was investigated by evaluating the ability of PAM to produce soluble factor(s) causing human lung fibroblasts to replicate. This study demonstrates that asbestos-treated PAM release factor(s) promoting human lung fibroblast replication, and suggests a possible role for PAM in the formation of the fibroblast clusters observed in the early lesions of asbestosis.

--Condensed from text

962/81 Comparison of Phagocytosis of Uncoated Versus Coated Asbestos Fibers by Cultured Human Pulmonary Alveolar Macrophages. T. L. McLemore, et al. Chest. 80: 39S-42S, July 1981, Supplement, 10 refs.

The current study demonstrates that while asbestos bodies are ingested by human pulmonary alveolar macrophages, they are much less toxic to PAMs than similar concentrations of naked (uncoated) ASB fibers. These data thus support the theory that ASB bodies are less harmful to human lung cells than uncoated ASB fibers and agree with a recent report by Churg and Warnock who concluded that quantitation of naked as well as coated asbestos fibers in human tissue and

sputum might be essential for determining the amount of occupational exposure as well as the degree of risk of asbestos related lung disease to a given individual.

--Condensed from text

963/81 Aryl Hydrocarbon Hydroxylase Activity in Pulmonary Macrophages and Blood Lymphocytes: Asbestos-Exposed Cigarette Smokers with and without Lung Cancer. D. R. Snodgrass, et al. Chest. 80: 42S-44S, July 1981, Supplement, 10 refs.

These results suggest that asbestos exposure may affect changes in a person's aryl hydrocarbon hydroxylase (AHH) responsiveness or total induced level in such a way as to increase that individual's susceptibility to the potential carcinogens found in cigarette smoke condensate. Whether asbestos-mediated alterations in AHH levels play a primary role in the etiology of lung cancer by potentiating the production of reactive intermediates of cigarette condensate polynuclear aromatic hydrocarbon is yet to be determined.

--Condensed from text

964/81 Asbestos Product Liability. G. A. Peters and B. J. Peters. J. Products Liability. 4: 49-54, 1981.

The magnitude and complexity of asbestos related product liability actions has spawned a number of provocative and interesting questions. These questions have significant practical, theoretical, and social relevance. This article defines and discusses some of the important questions and issues emerging from this product liability litigation.

--Authors' abstract

965/81 Pulmonary Asbestosis and Idiopathic Pulmonary Fibrosis: Pathogenetic Parallels. J. Gadek, et al. Chest. 80: 63S-64S, July 1981, Supplement.

The findings suggest that the parallels between IPF and pulmonary asbestosis may extend to a role for neutrophil collagenase in the pathogenesis of these fibrotic lung diseases.

--Condensed from text

966/81 Deposition Pattern and Clearance Pathways of Inhaled Chrysotile Asbestos. A. R. Brody and L. H. Hill. Chest. 80: 64S-67S, July 1981, Supplement, 3 refs.

The authors have shown that inhaled asbestos impacts initially on alveolar duct bifurcations and that significant interactions take place between the asbestos and underlying alveolar duct epithelial cells. Numerous fibers are removed from duct surfaces five hours after exposure, and by 24 hours after exposure alveolar macrophages have accumulated at alveolar duct bifurcations in

significant numbers. They propose that this is the initial lesion of asbestosis, and pathogenetic events in this anatomic region currently are under study. Early clearance through the alveolar epithelium would be a highly significant mechanism for introducing small asbestos fibrils into the pulmonary interstitium where interactions with macrophages and fibroblasts are known to occur during the pathogenesis of asbestosis.

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967/81 Mesothelioma Relative to Asbestos, Radiation, and Methylcholanthrene. S. Warren, et al. Arch. Pathol. Lab. Med. 105: 305-312, June 1981, 38 refs.

The carcinogenicity of chrysotile asbestos fibers (Canadian and Rhodesian) for the mesothelium of pleura and peritoneum of NLDH rats was explored by injection of 2 mg of asbestos fibers suspended in saline intratracheally, intrapleurally, or intraperitoneally, with or without ancillary radiation treatment (1,000 rad to the whole body of parabiont rats or 2,000 rad to the right thorax of single rats), or alternatively, by injection of asbestos plus 1 mg of 3-methylcholanthrene. A highly significant incidence of mesothelioma (3.8%) was noted in 159 rats treated with asbestos alone, as compared with 0.1% in 1,417 control rats. Additional treatment with radiation or 3-methylcholanthrene increased this incidence to 11.6% and 25.5%, respectively, the latter increase alone being significant at the .01 level of probability.

--Authors' abstract reprinted by permission

968/81 Inflammation and Asbestosis: Characterization and Maintenance of Alveolitis following Acute Asbestos Exposure. C. Schoenberger, et al. Chest. 80: 70S-71S, July 1981, Supplement.

These studies demonstrate that: (1) inhalation of asbestos results in an acute inflammatory response in the lung which is characterized by the presence of neutrophils; (2) one mechanism by which asbestos may attract neutrophils to the lung is by stimulating alveolar macrophages to release a chemotactic factor for neutrophils; (3) the release of the chemotactic factor by alveolar macrophages may be augmented by coating the asbestos fibers with serum factors.

--Condensed from text

969/81 Occupational Bronchopulmonary Disease Due to Glass Fibres. Clinical Observations. G. Chjappino, et al. Med. Lavoro. 72: 96-101, March/April 1981, 9 refs. (Italian).

In view of the still incomplete picture of the effects of glass fibres on the respiratory apparatus, three clinical cases were studied.

After prolonged exposure to glass fibres, the subjects showed signs of chronic bronchial irritation, haemorrhagic alveolitis and interstitial lung disease with alteration of alveolar capillary gas diffusion. These observations support the theory that glass fibres of a respirable size can have an effect on the lung similar to that of asbestos fibres.

--Authors' abstract in English

970/81 Farmer's Lung - Description of 17 Cases. A. Siracusa, et al. Med. Lavoro. 72: 118-127, March/April 1981, 35 refs., (Italian).

In this study, 17 cases of farmer's lung are presented, with particular regard to clinical, radiographic, lung function and serological characteristics. Based on the criteria adopted, an acute form was diagnosed in 8 subjects, a chronic form with acute onset in 6 subjects, and a chronic form with insidious onset in 3 subjects. On the basis of the available literature, the Authors are of the opinion that the incidence of farmer's lung in Italy is underestimated. They believe that this situation is due to the insufficient knowledge of the disease among General Practitioners, who are the first, and often the only ones, to observe the characteristic clinical features of the disease in its acute phase.

--Authors' abstract in English

971/81 Neoplasm of the Nasal Cavities and the Paranasal Sinuses and Occupational Exposure to Wood Dust. E. Merler, et al. Med. Lavoro. 72: 87-95, March/April 1981, 24 refs., (Italian).

An epidemiological study was made for the period 1969-1979 on tumours of the nasal cavities and paranasal sinuses in the Ear, Nose and Throat Departments of hospitals in the Province of Verona. Out of 25 patients with neoplasm, there were 16 carcinomas and 9 non-epithelial tumours. Among the carcinomas, there were 3 cases of adenocarcinomas, all males and all wood workers. Two other workers with epithelial tumours (one squamous and one undifferentiated) had been employed in wood processing industries. The study was a case-case type investigation and was carried out by interviewing the subjects and their families and examining clinical files and histological specimens.

--Authors' abstract in English

972/81 Lung Disease Due to Abuse of Hairspray. J. L. Wright and D. W. Cockcroft, Arch. Pathol. Lab. Med. 105: 363-366, July 1981, 14 refs.

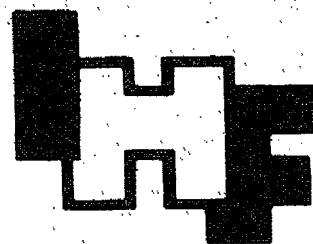
A case of pulmonary lipid granulomata in association with abuse of hairspray was studied. Light microscopic and ultrastructural examination of the lung biopsy specimen demonstrated distorted alveolar architecture, with marked increase in interstitial collagen. Multiple macrophages, both interstitial and intra-alveolar, contained abundant lysosomes and lipid vacuoles.

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INDUSTRIAL HYGIENE DIGEST

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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.
 Production: Debra A. Bowers, Joy H. Henning

October 1981
 Volume 45, No. 10

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1093/81 Acceleration of Lipid Peroxidation in Human Paraquat Poisoning. T. Yasaka, et al. Arch. Internal Med. 141: 1169-1171, August 1981, 14 refs.

A 20-year-old man ingested approximately 15 to 20 mL of a 24% solution of paraquat. Acute renal and liver failure developed. The patient began undergoing hemodialysis and receiving vitamin E, but he died of pulmonary fibrosis the 27th day after the ingestion. During a two-week period of observation, evidence of lipid peroxidation in his serum was noted by determining malondialdehyde levels. Guinea pigs exposed to paraquat showed similar patterns of malondialdehyde presence in plasma. These results indicate that increased serum or plasma levels of lipid peroxide occurring in paraquat poisoning might reflect production of highly reactive oxygen free radicals and that possibly levels of lipid peroxides could serve as indicators of the efficacy of therapy directed toward scavenging free radicals.

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1094/81 The Effects of Paraquat and Superoxide Dismutase on Pulmonary Vascular Permeability and Edema in Mice. S. N. Giri, et al. Arch. Environ. Health. 36: 149-154, July/August 1981, 42 refs.

Intraperitoneal administration of 50 mg/kg paraquat dichloride to mice significantly increased pulmonary vascular permeability at 24 and 48 hr, as measured by 125 I-albumin content of alveolar lavage. Lung edema, measured by lung weight as percent body weight, was significantly increased 48 hr after paraquat treatment. Intravenous administration of four doses of superoxide dismutase at 12-hr intervals (i.e., one before and three after paraquat treatment) failed to inhibit paraquat-induced increased pulmonary vascular permeability and pulmonary edema. Superoxide dismutase treatment also failed to reduce mortality and had no significant effect on the death time course in animals challenged with paraquat. The results of this study suggest that acute toxic effects of paraquat, such as increased pulmonary vascular permeability and pulmonary edema, may not be mediated through the generation of superoxide anion.

--Authors' abstract

INDUSTRIAL DUSTS AND INHALANTS

1095/81 Mechanisms of Asbestos Carcinogenesis. B. T. Mossman and J. E. Craighead. Environ. Res. 25: 269-280, August 1981, 38 refs.

A striking synergistic effect on tumor induction is seen when asbestos and polycyclic hydrocarbons (PCH) are inhaled by or instilled intratracheally into rodents. This observation supports the results of epidemiologic studies indicating that the incidence of bronchogenic carcinoma is increased substantially in smokers occupationally exposed to asbestos. To determine the mechanisms of asbestos-induced carcino-

genesis at the cellular level, cell and organ cultures of tracheobronchial epithelium were examined morphologically and biochemically after their exposure to asbestos with and without the adsorption of PCH to its surfaces. Asbestos was phagocytized by the basal cells of the epithelium. The mineral stimulated cellular division, hyperplastic and metaplastic changes, and induction of Na^+/K^+ ATPase, a marker enzyme for the plasma membrane. The metabolism of 3-methylcholanthrene (3 MC), as determined by aryl hydrocarbon hydroxylase (AHH) activity in monolayers of epithelial cells after their exposure to both asbestos and 3 MC, was potentiated. A hypothetical construct depicting the role of asbestos in carcinogenesis of the respiratory tract is presented.

--Authors' abstract reprinted
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1096/81 Chrysotile Asbestos Fibers in Drinking Water from Asbestos-Cement Pipe. M. S. Kanarek, et al. Environ. Sci. & Technol. 15: 923-925, August 1981, 14 refs.

Chrysotile asbestos fiber counts were compared in drinking water samples taken before and after flow through asbestos-cement pipes in the San Francisco Bay area. The drinking water supplies in that area are chemically nonaggressive by the standard measures. In one major distribution system mean chrysotile counts were 115 times greater in drinking water after flow through the pipe. This demonstration of substantial increases in asbestos fiber counts in nonaggressive drinking water raises questions as to the validity of aggressiveness indexes for prediction of fiber release from asbestos-cement pipes.

--Authors' abstract reprinted
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1097/81 Dry Removal of Asbestos. J. D. Elias. Am. Ind. Hyg. Assn. J. 42: 624-625, August 1981, 4 refs.

A method for the dry removal of friable asbestos has been developed. The Workplace Safety and Health Branch in Manitoba's Labour and Manpower Department and Power Vac Manitoba Limited have co-operated in the production of an improved procedure. It was employed for the first time in the fall of 1979 when the Industrial Hygiene Section was asked for advice about removal of asbestos from a Winnipeg School Division warehouse. Fans were used to maintain the work area under negative pressure to prevent the spread of asbestos throughout the building. The exhaust air was filtered to prevent environmental contamination, and special precautions were taken to protect workers.

--Author's abstract reprinted
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098/81 Analyses of Tissue, Blood, and Urine Samples from a Baboon Gavigated with Chrysotile and Crocidolite Asbestos. W. H. Hallenbeck, et al. *Environ. Res.* 25: 349-360, August 1981, 14 refs.

Tissue, blood, and urine samples from one test and one control baboon were analyzed by transmission electron microscopy for the presence of chrysotile and crocidolite asbestos. The test animal had been gavaged with cumulative doses of 800 mg each of chrysotile and crocidolite asbestos. Urine and blood samples were collected during the 16-day average and 21-day postgavage period. Twenty-two issues were collected at sacrifice. None of the analyses of tissue, blood, or urine samples from the test animal exceeded the expected level of background contamination for chrysotile. One crocidolite bundle was observed in a test sample. The results of this study indicate that asbestos fibers do not penetrate the gastrointestinal tract of the baboon and migrate to various tissues.

--Authors' abstract reprinted
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099/81 Fibrous Zeolites and Endemic Mesothelioma in Cappadocia, Turkey. R. Lilis. *J. Occup. Med.* 3: 548-550, August 1981, 6 refs.

The possibility that fibrous materials other than asbestos may be responsible for the spectrum of disease classically associated with asbestos fibers is, including the carcinogenic effect, seems to have now been epidemiologically documented. Thus, the hypothesis formulated by Stanton, on the basis of experimental data, seems to have been confirmed for fibrous zeolites. Direct experimental confirmation of fibrous zeolites' carcinogenicity has recently been reported by Suzuki. Intraperitoneal administration of the fibrous zeolite erionite in mice resulted in peritoneal mesothelioma. The possibility that environmental exposure to fibrous zeolites in other areas of the world, and occupational exposures to such materials in zeolite mining, milling, processing and usage, might result in similar effects needs to be actively investigated. Other mineral fibers with similar dimensional and stability characteristics should also be carefully considered with respect to their possible biological effects.

--Condensed from text

000/81 Changes of Copper, Iron, and Zinc in the Serum of Patients with Silicosis, Silicotuberculosis, and Active Lung Tuberculosis. T. Niculescu, et al. *Environ. Res.* 25: 260-268, August 1981, 23 refs.

The serum concentrations of copper, iron, and zinc in silicosis were investigated related to the X-ray stage of the disease (according to the I.L.O.-U/C 1971 pneumoconiosis international classification), the TB complication, and to the plasma proteins level. The determination of oligoelements and plasma proteins was performed in 15 subjects suspected of silicosis and in 141 silicotic patients, selected on three criteria: the type criterium (opacity

size, p, q, r), category criterium (number of opacities, 1, 2, 3), and TB complication criterium. The doses of copper, iron, and zinc were also established in 28 active lung TB patients and in a control group. The increase of the copper values in blood serum was noticed, simultaneously with the progress of silicosis, the highest change being found in the subjects with silicotuberculosis and active TB. A decrease of serum iron was also recorded, parallel to the silicosis evolution, as well as a hypozincemia with no variations related to the stage of the silicosis. No correlations were found between the changes of the oligoelements and the changes of plasma proteins.

--Authors' abstract reprinted
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1101/81. Silicate Pneumoconiosis and Pulmonary Fibrosis in Horses from the Monterey-Carmel Peninsula. L. W. Schwartz, et al. *Chest.* 80: 82S-85S, July 1981, Supplement, 10 refs.

Pneumoconiosis is generally associated with occupational (industrial) exposure or unusual behavioral habits. Geographic features have been recognized in certain cases from arid or desert areas where soils are rich in silicates. This report summarizes the authors' experience with nine cases of granulomatous pneumonia in horses presenting with exercise intolerance and various degrees of respiratory distress. All cases have originated from the Monterey-Carmel peninsula or the Carmel Valley of California; all cases have been spontaneous and an industrial association has not been recognized. Since animal populations are frequently used as indicators of human disease, this observation of equine disease may serve as a signal for a previously unrecognized environmental disease with potential human health implications.

--Condensed from text

1102/81 Enzyme Changes During Experimental Silicotic Fibrosis. I. PZ Peptidase and Collagen Deposition in the Lungs. J. Hurych, et al. *Environ. Res.* 25: 424-433, August 1981, 24 refs.

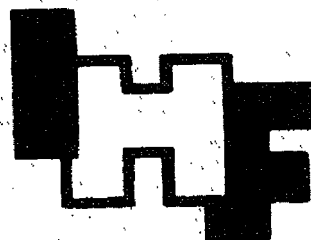
In various time intervals from 2 to 22 weeks after intratracheal quartz dust instillation (25 mg DQ₁₂) the content of collagen proteins, deoxyribonucleic acid, soluble proteins, and collagen peptidase activity (PZ substrate) in rat lungs were estimated. In the period from 2 to 8 weeks the total amount of collagen as well as enzyme activity increased in parallel by about 200% in comparison to controls. In later periods (16 and 22 weeks after dust instillation) disproportions occurred. Collagen content in silicotic lungs continued to increase; the total activity of collagen peptidase in lungs started to decrease as did the specific enzyme activity. There was also observed a decrease in the content of lung proteins soluble in isotonic KCl. From 6 weeks onward, disc electrophoresis showed changes in the proportions of these proteins in dusted rats. The changes were particularly manifest in postalbumins,

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INDUSTRIAL HYGIENE DIGEST

Editor: Jane F. Brislin, M.L.S.
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not be permitted to work at heights greater than 1.7 m from ground level unless there is built-in physical protection to prevent the employee from falling a distance greater than his or her height. The epileptic should not be permitted to operate hazardous or mobile equipment and, in fact, should not work immediately adjacent to such equipment. Such work restrictions should be applied for at least two years after onset of the seizure disorder. The restrictions may be removed if the employee is free of seizures for one year, once the two-year limit has been reached. Consideration should be given to reapplying work restrictions when the patient is removed from medication or if the medication is to be changed. It is important that application or reapplication of restrictions must be determined by the physician's knowledge of the employee and the employee's reliability, as well as past history of control.

--Condensed from text

SKIN DISEASES AND BURNS

1199/81 Measurement of Blood Flow and Vascular Permeability Changes in Response to 12-O-Tetradecanoyl-Phorbol-13-Acetate and to Asbestos Fibers. J. A. Hamilton, et. al. J. Toxicol. Environ. Health 8: 205-214, July/August 1981. 36 refs.

The hyperemia (increased blood flow) and vascular permeability changes induced in rabbit skin by the tumor promoter 12-O-tetradecanoyl-phorbol-13-acetate and by asbestos fibers have been quantitated. The resultant hyperemia, measured with radiolabeled microspheres, was inhibited in both cases by steroidal and non-steroidal anti-inflammatory drugs. Since the inflammatory responses resulting from exposure to these agents might be important for the subsequent development of neoplasms, it is proposed that such a specific and quantitative technique be used to analyze the components of these inflammatory responses in more detail.

--Authors' abstract
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1200/81 Industrial Solvents: Some Factors Affecting Their Passage into and Through the Skin. M.G. Bird. Ann. Occup. Hyg. 24: (2), 235-244, 1981. 35 refs.

There are numerous industrial applications in which skin contact with solvents may occur. An awareness of the main factors which determine the passage of such materials into and through the skin is important in order to fully utilize, and not abuse, its protective role in the occupational situation. These factors are illustrated by reference to some of the data and concepts available in the existing literature. Whenever possible, an attempt has been made to link these observations to the applied situation and to highlight those factors and/or their combination which should be minimized in good

industrial hygiene practice.

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1201/81 Cross Reactions Between Some Pesticides and the Fungicide Benomyl in Contact Allergy. T. Matsushita and K. Aoyama. Ind. Health 19: (2), 77-83, 1981. 17 refs.

To clarify the cross sensitivity between the fungicide Benomyl and some other pesticides, an animal experiment and a field survey were undertaken. 1. About 20% of female farmers, who had not used benomyl, showed positive reactions to 1% benomyl in patch tests. From the results of patch tests, cross reactions between benomyl and such pesticides as Diazinon, Saturn, Daconil and Z-Bordeaux were considered to occur. 2. The results of guinea pigs maximization tests suggested that cross reactions occurred between benomyl and such pesticides as Diazinon, Kitazin P, Daconil and Z-Bordeaux. It may be concluded that the fungicide benomyl shows contact allergic cross reactions with some other pesticides.

--Authors' abstract

CHEMICAL HAZARDS

1202/81 Cadmium Absorption and Tissue Distribution in Rats Provided Low Concentrations of Cadmium in Food or Drinking Water. D.R. Buhler, et al. J. Toxicol. Environ. Health 8: 185-197, July/Aug. 1981. 18 refs.

Tissue Cd levels were determined 1,2,4,8, and 12 wk after weanling rats were provided with food or water containing 1-1000 ng/g Cd as ¹⁰⁹CdCl₂. No differences in growth rate or organ weight were observed over the concentration range tested. Kidney accumulated the highest concentration of Cd, followed by liver with values one-third to one-fourth those found in the kidney. Liver, however, accounted for 35-55% of the total body burden, while kidney contained only 35-45%. Cd concentrations in the various tissues increased with time and the Cd concentration of the food or water. The percentage of the ingested dose absorbed in a given time was relatively constant over the tested Cd concentration range. However, for each metal concentration, the percent of Cd absorbed decreased with exposure time. Regression analysis established that female rats accumulated Cd at a higher rate and retained a greater percentage of the ingested Cd than did male rats and that tissue concentrations were higher in rats exposed to Cd in the water. The differences in tissue Cd levels are probably related to proportionally higher metal intake by females and to higher intake from water than food at equivalent concentrations. It is uncertain whether the greater retention of ingested Cd by females is due to more efficient

of *Candida albicans* than the talc. The enhanced fibrogenicity has been attributed to the adjuvant activity of kaolin with polysaccharide glucan component of *Candida*.

--Authors' abstract

1226/81 The Biological Effects of Mineral Fibres. J.M.G. Davis. *Ann. Occup. Hyg.* 24: (2), 227-234, 1981. 29 refs.

The history of asbestos-related disease and the results of research into the ways in which asbestos fibres are able to damage tissue are reviewed. Although crocidolite has been accepted as constituting a particularly great hazard and is subject to a more stringent hygiene standard that has effectively terminated its use in the U.K., experimental studies on animals have not proved it to be more carcinogenic than chrysotile. It is possible that rats react differently from humans, but more likely possibilities are that in past industrial usage crocidolite produced higher dust concentrations than amosite or chrysotile and that chrysotile is less durable than crocidolite in the lungs over the 10-20 yr that tumour induction takes in man. Other mineral fibres, both natural and man-made, have come under study and there is some evidence from laboratory experiments that they may produce similar effects to asbestos if of comparable size. The position for man-made insulation fibres appears relatively good and the results of studies of human populations exposed to glass fibre have so far been negative. While not all mineral fibres may constitute a health hazard if used industrially, there is enough evidence of potential harm to indicate that all new types of fibre should be subjected to careful testing.

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1227/81 Asbestos Related Pulmonary Disorders in Japan. I. Ebihara. *J. Science Lab.* 57: 363-396, Aug. 1981. 101 refs. (Japanese)

In this study, chest radiographs of 11,000 persons over 65 yr. old were examined before collating with the life history of each person, and after evaluation of each radiograph, the life history--especially past asbestos exposure--was collated with the radiographical findings. However, exposure to, or contact with asbestos was ascertained in each case with pleural plaque. These results seem to suggest that the diagnostic standard for pleural plaque adopted in this study was reasonable and acceptable. It was noteworthy that pleural plaques were frequently confirmed by oblique radiography, even in those whose posterior-anterior X-ray film seemed to be normal. As many other researchers, the author is also of the opinion that pleural plaques can occur with low-dose or short-term asbestos exposure. Moreover, it should be emphasized that pneumoconiotic lung change, viz., asbestosis, can also occur long-term after

low-dose or short-term asbestos exposure. Ventilatory impairments were frequently noted among old persons, who had a history of occupational asbestos exposure, even if they had no asbestotic pleural changes. Restrictive ventilatory changes have been considered to be the most important respiratory impairment due to asbestos exposure; however, it should be emphasized that obstructive changes and emphysematous functional changes can frequently occur many years after asbestos exposures. Restrictive and obstructive ventilatory impairment was more prevalent and more serious among persons with pleural plaques than those without these changes. Even at present, asbestos-related respiratory disorders are frequently observed among old persons living in the metropolitan area. When we take account of the fact that the import of asbestos rapidly increased since 1960, asbestos health hazards must hereafter spread more widely and become more serious in the metropolitan area.

--Author's abstract in English

1228/81 Asbestos Concentrations in Public Buildings -- A Preliminary Report. J.M. LeGuen and G. Burdett. *Ann. Occup. Hyg.* 24: 185-189, 1981. 6 refs.

Airborne asbestos concentrations were measured by a variety of sampling and analytical techniques, in 4 schools, 2 other educational establishments, 5 houses, a theatre and a television studio, in all of which asbestos-containing construction materials had been used. At some sites these materials had been damaged to expose visible fibres, but in no case did airborne asbestos concentrations exceed 10^{-6} g/m³, roughly 0.02% of the occupational hygiene standard for chrysotile, or 10^{-8} g/m³ in the three cases where the TEM was used.

---Authors' abstract reprinted by permission

1229/81 Lung Instantaneous Time-Constant in Smokers and Non-smokers Exposed to Asbestos. F. Sulotto, et al. *Med. Lavoro* 72: 222-226, May/June 1981. 15 refs. (Italian)

Lung instantaneous time-constant has been calculated from flow volume curves of 4 groups of subjects: 18 smoking asbestos workers, 18 non-smoking asbestos workers, 14 non-exposed subjects, 16 non-smoking non-exposed subjects. All the subjects had normal clinical findings and X-Ray PA films. Asbestos workers showed VC and FEV_{1.0} significantly lower than non-exposed, although the mean values for each group were within normal predicted values. The joint additive effect of asbestos and smoking as well as the individual effects of both were statistically significant of MEF₂₅, even though all values were within the range of normality. Among the parameters related to time-constant

measurement, only the mean value showed a significant separation of smokers and non-smokers. No difference was found between asbestos-exposed and non-exposed subjects.

--Authors' abstract
in English

1230/81 Inorganic Fibers in Lung Tissue from Patients with Pleural Plaques or Malignant Mesothelioma. B. Cylseth, et al. Scand. J. Work Environ. 7: 109-113, June 1981. 12 refs.

The concentration of inorganic fibers in the lungs of patients with malignant mesothelioma and pleural plaques has been compared to that of patients without cancer or chronic respiratory diseases. The fiber concentrations have been determined by scanning electron microscopy and given as number of fibers per gram of dried tissue. A statistically significant difference in inorganic fiber content was found between the different groups.

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1231/81 Effects of Mixed Cotton and Synthetic Fiber Dusts on Ventilatory Capacity of Textile Mill Workers. D. Parvizpour and F. Shadan. Med. Lavoro 72: 198-203, May/June 1981. 13 refs.

162 non-smoking male weavers in a textile mill working with a mixture of cotton and synthetic fibers were recruited for the assessment of lung function by performing forced expiratory flows and volumes. FVC% PFVC, FEV₁%PFEV₁, and FEV₁%FVC were all reduced but were still within normal limits, while the mid-expiratory flow (FEF₂₅₋₇₅%PFEF₂₅₋₇₅) showed a greater decrease, with values slightly below normal. This slight decrease in response to exposure to mixed dust indicates that dust produced by synthetic fibers does not have the same adverse effects as cotton dust. FEF₂₅₋₇₅%PFEF₂₅₋₇₅ is recommended as a sensitive test for the assessment of ventilatory function impairment in textile mill workers exposed to mixed dust.

--Summary

1232/81 Prediction of Fibrogenicity Degree of Silico-Containing Dust in Relation to Surface Properties of Particles. T.B. Velichkovskaya, et al. Gig. Trud. Prof. Zabol. (6), 34-36, 1981. 2 refs. (Russian)

The degree of fibrogenicity of quartz dust was revealed to correlate with physicochemical properties of the particles. The most important hygienic parameters of silico-containing dust, determining the degree of their fibrogenicity, are the mass of the current dust, free quartz dioxide content, molecular structure, and physico-chemical properties of the particles' surface. These parameters may

be used for prediction of fibrogenicity of quartz dust.

--Authors' abstract
in English

1233/81 Morphogenesis of Anthracotic Tuberculosis. N.Z. Slinchenko. Gig. Trud. Prof. Zabol. (7), 14-17, 1981. 31 refs. (Russian)

A morphological, histochemical, and bacteriologic study was performed of the material from 100 miners who died from, and 1032 miners operated on for various forms of tuberculosis, siderosilicosis and silicotuberculosis. Special attention was paid to the development of anthracotic tuberculosis as a united process that permitted a morphologic study of the main anatomic structures of the disease and allowed the author to determine the reasons for and ways of its progression. The changes detected are viewed from the standpoint of immunopathology of the above diseases.

--Author's abstract
in English

1234/81 Biochemical Changes in Rat Lungs After Exposure to Nitrogen Dioxide. J.J. Ospital, et al. J. Toxicol. Environ. Health 8: 47-58, July/Aug. 1981. 41 refs.

Sixty-day-old male, specific pathogen-free rats were exposed continuously to 5 or 15 ppm NO₂ for 1-7 d. Lung tissue from exposed and control rats was then analyzed for biochemical and enzymatic parameters. The exposure resulted in increased lung enzymatic activities, including elevated protein and DNA contents and nonprotein sulfhydryl levels. Biochemical and enzymatic parameters generally increased maximally after 4 d and remained elevated for up to 7 d of continued exposure. The magnitude of these increases was higher for 15 than for 5 ppm NO₂. The increases in biochemical and enzymatic parameters may have occurred in response to NO₂-induced lung injury.

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1235/81 Effects of Sulfuric Acid and Nitrogen Dioxide on Airway Responsiveness of the Guinea Pig. S.A. Silbaugh, et al. J. Toxicol. Environ. Health 8: 31-45, July/Aug. 1981. 37 refs.

Hartley guinea pigs were exposed for 1 h to either NO₂ gas or H₂SO₄ aerosol and examined for changes in airway responsiveness to inhaled histamine. Concentrations ranged from 7 to 146 ppm NO₂ and 4 to 40 mg/m³ H₂SO₄. One group of animals exposed to filtered air served as controls. Histamine challenges were performed on unanesthetized animals 2 h before pollutant or air exposure (baseline) and 10 min and 2 and 19 h after exposure. NO₂-exposed