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Industrial Hygiene Digest

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PLAINTIFF'S EXHIBIT

CHR-304

(with penalties for entry refusal), require metering of effluent discharge as the basis for local clean water taxation, require registration of all potential polluters, empower the Government to call abatement conferences on intrastate pollution without the consent of governors, and eliminate six-month intervals between federal abatement actions.

-- Chem. Eng. News 44, 29 (Mar. 7, 1966)

BOOKS, PAMPHLETS AND NOTICES

- 323 Biological Effects of Asbestos. New York Academy of Sciences. 2 East Sixty-third Street, New York, N. Y. 10021. 766 pp. (December 31, 1965). AVAILABLE FROM: New York Academy of Sciences. PRICE: Not given.

This series of papers is the result of a conference held by the New York Academy of Sciences on the same subject (October 19-21, 1964), covering the following general areas: Asbestos Materials in Modern Technology; Lung Tissue and Mineral Matter: Problems of Pathogenesis; Human Exposure to Asbestos: Industrial Populations, Community Studies, Dust Controls and Standards; Clinical Studies of Pulmonary Asbestosis; Asbestos and Neoplasia: Experimental, Epidemiology, and Diffuse Mesothelial Tumors; and Problems and Perspectives. Appendix 1 presents the findings of the working group on Asbestos and Cancer, under the general headings of Epidemiology, Pathology, Physics and Chemistry. It is recommended that the relationship of different types of asbestos and tumorigenesis be studied in exposed populations on an international basis; that the importance of dosage (concentration and duration of exposure) be evaluated; and that the question of progression following removal from exposure be studied with full consideration of cancer mortality as well as morbidity from asbestosis in populations no longer exposed to the dust. Conversely, all cases of diffuse mesothelial tumors of pleura and peritoneum should be investigated by standardized pathological techniques for presence of asbestos to establish any association with asbestos or other factors. Criteria for pathological diagnosis are discussed. Hyaluronidase is mentioned as being often present in mesothelial tumors and where present is a valuable diagnostic aid, but as it is not invariably found in histochemical and chemical tests in the presence of mesothelioma, it should not be the sole diagnostic criterion. Other diagnostic pitfalls, such as encountered in use of exfoliative cytology and tissue culture are also mentioned. Need for more precisely planned experimental studies is emphasized and recommendation is made for creation of pathology reference panels to help establish standards for pathological classification. Appendix 2 reviews in detail the status of compensation for dust diseases of the lungs under State Workmen's Compensation laws. The cost of dust diseases is heavy when compared to the cost of all occupational disease, but not in comparison to the total for all accidental injuries and occupational diseases combined. Correction of certain inequities in payment of medical benefits and compensation of workers with occupational diseases is recommended. Appendix 3 presents in tabular form statistics on asbestos production, updating data in the U. S. Bureau of Mines Information Circular of 1959 to 1962 and data on other countries up to 1963 is present.

- 324 Official FDA Tolerances. NAC News and Pesticide Review 24:3. 23 pp. (February, 1966). AVAILABLE FROM: National Agricultural Chemicals Association, 1155 15th Street, N. W. Washington, D. C. 20005. PRICE: 25 cents per copy (minimal charge of \$1.00).

This issue of NAC News and Pesticide Review is the 12th annual revision of the official FDA tolerance for pesticides, listed by crop categories. Incorporated are all of the changes, additions, or deletions that have been officially announced from the time the Miller Pesticide Residue Amendment was enacted into law in 1954, up to and including December 31, 1965. Also included in this issue are lists of (1) tolerances established under the Food Additives Amendment, (2) common, chemical and/or trade names of pesticides and (3) inert ingredients which are exempt from the requirements of a tolerance. This issue provides a ready (and fairly up to date) reference for those with uses for such information without the necessity of continually referring to the Federal Register from which the list was compiled. Since the Federal Register is, however, the official means of communication for such information, the issue cannot serve in lieu of the Federal Register in cases of error.

- 389 Observations on the Relationship Between Quartz Cytotoxicity and Fibrogenicity While Testing the Biological Activity of Synthetic Polymers. H. W. Schlipkoter and E. G. Beck. Med. lavoro 56, 485-493 (June-July 1965).

After illustrating the cytotoxic action of quartz and the mechanism of action of polyvinylpyridine-N-oxide, the authors discuss in detail cell culture experiments carried out to obtain further information on the cytotoxic effect of quartz and to test different protective substances. Experiments with protecting polymers, carried out in parallel in vitro and in vivo, should demonstrate whether experiments on cell cultures may replace trials on experimental animals. The results obtained do not support this possibility, as in some cases the observations in vivo and in vitro are at variance. The causes for such disagreements are discussed. -- APCA Absts.

- 390 The Retention of High and Low Rank Coals in Rats' Lungs. J. W. Skidmore, et al. Ann. Occ. Hyg. (London) 8, 182-192 (May, 1965).

The prevalence of coal workers pneumoconiosis appears to be higher in high rank than in low rank coal mines. Two experiments were carried out to test whether rats inhaling dust of high and low rank coal at equal concentrations, take up and retain the high rank coal more than the low rank coal. The results did not show any sign of such an effect and it is concluded that a similar effect in man is unlikely. Certain differences in the results of the two experiments are described and discussed. -- APCA Absts.

- 391 Lysosomal Enzymes in Relation to the Toxicity of Silica. J. S. Harington and A. C. Allison. Med. lavoro 56, 471-484 (June-July 1965).

Several studies have shown that damage to the macrophage by silica is a prerequisite for the subsequent fibrosis caused by this dust. The present study concerns the nature of the primary damage to the cell by silica and emphasizes the importance of lysosomes and phagosomes (or phagocytic vacuoles) in this process. The experimental evidence indicates that silica particles are taken up into phagosomes in the cytoplasm of the macrophage. Once taken up, the silica, either directly (by surface action) or by the release of silicic acid in a confined situation, damages the membrane of the phagosome in such a way that the hydrolytic enzymes secreted into it by lysosomes during phagocytosis are released into the cytoplasm of the cells. This results in autolysis and the eventual death of the cell. The damage to the phagosomal membrane is believed here to be the primary site of damage to the cell by silica. -- APCA Absts.

- 392 Intratracheal Injection Into Rats of Size-Graded Silica Particles. B. Goldstein and I. Webster. Brit. J. Ind. Med. 23, 71-74 (Jan. 1966).

An experiment is described in which suspensions of size-graded silica particles of less than one micron, one to three microns, and two to five microns nominal size ranges and of equal surface area (600 sq. cm. /ml.) were injected intratracheally into rats. After four months the rats were killed and the lungs were examined histologically for the grade of fibrosis and chemically for the silica and collagen content. The results were analyzed statistically and it was found that, under the experimental conditions described, the degree of fibrosis produced by the two large size fractions was more than that produced by the under one micron particles and was apparently related to the quantity (by weight) of the silica injected or the size of the particles and not to the surface area. -- Authors' absts.

- 393 Observations on Pollution Caused by Asbestos. A. Laamanen, L. Noro, and V. Rainio. Occupational Medical Foundation and Institute of Occupational Health, Annual Report 1964. Helsinki, 1965 pp. 41-42.

The quarrying of asbestos in Finland has a tradition of approximately 50 years. The production is nowadays about 15,000 tons of antophyllite asbestos. In his work on non-occupational endemic asbestosis, published in 1960, Dr. R. Kiviluoto mentioned that in approximately 500 persons living around the quarries calcifications of pleura were found in x-ray examinations. Dr. V. Rainio, who at present is studying further the incidence of pleural calcifications among the population around the quarries, has mentioned that 1300 additional cases have been found. Dr. Kiviluoto, however, estimates that approximately ten per cent of the population living around the quarries might have pleural plaques. At the request of Dr. V. Rainio and the Finnish asbestos company, Suomen Mineraali, the Institute of Occupational Health has performed some air pollution studies around quarries, trying especially to find out the presence of asbestos in the air. In the following there are some preliminary observations. The first survey was made between August 20—November 28, 1961, and

samples were taken at 13 points around the quarries. A second survey was made between June 25—November 29, 1963. The results of these surveys are presented and are available upon request.

- 324 Certain Immunobiological Shifts in Asbestosis. F.M. Kogan, A.A. Gerasimenko, and G.I. Bunimovich. *Gigiena i Sanit.* 30, 34-40 (May, 1965). Russian.

Long-term inhalation of asbestos dust brought about a fall of the immunobiological reactivity of the body and, probably, its allergic responses. There was a most distinct inhibition of the complement titer. The changes of the complement titer preceded the onset of clinical and x-ray symptoms of pneumoconiosis. The study of the immunobiological reactivity of persons sick with asbestosis, caused by the inhalation of chrysotile-asbestos and anthophyllite-asbestos, showed that in the first case the reactivity was inhibited to a greater extent. This was noted in the clinical course of asbestosis as well. Persons sick with asbestosis and those working under conditions of high dust content of the air presented lesions peculiar to auto-immunologic disease: rise in the alpha-globulin content and anti-complement activity of the serum.

-- APCA Absts.

- 325 Electron Microscope Studies of Asbestos in Man and Animals. J. M. G. Davis. *Med. lavoro* 56, 521-529 (June-July 1965).

In both guinea pig and human lung material the formation of asbestos bodies has been shown to be an intracellular process. The first sign of asbestos body formation is the accumulation of dense granules approximately 60 Å in diameter around the asbestos fiber. It is suggested that these granules represent ferritin material. Usually the asbestos body coating consists of a single dense layer of ferritin, but often a whole series of layers of varying density is present. The outermost zone of these bodies often consists of an irregular layer of radially arranged fibrous material but occasionally the whole body coat consists of these fibers which have a diameter of 50-60 Å. From the evidence of this study it would appear that the well known segmentation of asbestos bodies can be of two types. In one the segmented appearance is due to the deposition of the body coating in separate globules, and in the other it is due to the splitting of a previously smooth coat.

-- APCA Absts.

PHYSICAL ASPECTS OF THE ENVIRONMENT

- 326 Recent Findings in the Pathogenesis of Decompression Sickness (Dysbarism). A. T. K. Cockett, R. M. Nakamura, and J. J. Franks. *Surgery* 58, 384-389 (Aug. 1965).

A recent review of human decompression sickness pointed out that one-third of the reported cases suffered from hemoconcentration. This prompted the authors to document this apparent loss of plasma volume by measuring intravascular fluid shifts in experimental animals before and after decompression. Mongrel dogs were used as experimental animals. After suitable catheters had been placed in the animals, they were placed in the overcompression-decompression chamber and were overcompressed to six atmospheres absolute. The increase in barometric pressure was seven pounds (psi) per minute. After a stabilization period of 60 minutes the animals were decompressed at a rate of seven pounds (psi) per minute. The plasma volume decreased from four to 38% up to 5-1/2 hours after removal of seven dogs from the decompression chamber. The role of the bubble formation with progressive reduction in blood pressure is discussed in the slower deaths of ten animals. Bone marrow emboli were found on routine histologic sections of all the animals who were autopsied. Nevertheless, the exact pathophysiologic mechanism of dysbarism remains obscure according to the authors.

-- Cond. from Am. Rev. Resp. Dis. Absts.

- 327 The Effect of Joint Action of Noise and Vibration on the Vibration Sensitivity of Adolescents. A. I. Tsysar. *Gigiena i Sanit.* 30, No. 6, 30-36 (1965). Russian.

The authors studied the effect produced from work with electric and pneumatic instruments on the vibration sensitivity of adolescents and the extent of the noxious effect produced by various parameters of vibration. The adolescents were highly sensitive to the action of noise and vibration factors: a rise in the threshold value of the vibration sensitivity was noted in case of a comparably short service record and a short term of work with the instruments. In the course of a work day, changes of the vibration sensitivity occurred mainly in insignificant and moderate rises of its threshold values, which are evidently connected with changes in the functional state of the vibration analyzer.

-- Public Health Eng. Absts.