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LITERATURE ABSTRACTS

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dust and kieselguhr dust produce no appreciable injurious action on the protoplasmic structure. Some minerals such as certain varieties of silica have a coagulating action on the protoplasm. A mass of particles may be surrounded by a cloud of coagulated protoplasm, not clearly defined. When fragments of cells containing silica are phagocytosed, the cloud has a membrane. Calcite particles are contained in large vacuoles. Mica produces vacuolation but the particles lie outside the vacuoles. Further investigation is indicated into the capacity of the liberated waste of cellular proteolysis to provoke fibrosis. Investigation of the effects of mixed dusts is now being pursued. -- Cond. from Bull. Hyg.

461 The Investigation of Anti-Lung Antibodies in Silicosis. E. Kalman, A. Mandi and M. Osztovics. Med. lavoro 53, 165-169 (Mar. 1962).

The authors have investigated the presence of anti-lung antibodies in the sera of 40 patients, in different stages of silicosis. Steffen's anti-human globulin consumption test has proved to be suitable for the demonstration of anti-lung antibodies. The authors have succeeded in demonstrating anti-lung antibodies in 82.5% of the silicotic sera investigated. It has been stated by the authors that these antibodies, isolated from the sera of silicotic patients by means of immunoelectrophoretic methods, have proved to be gamma- and beta-globulins. The latex fixation test was negative on the sera of silicotic patients. -- APCA Absts.

462 Physiological Reactions of the Respiratory System Under the Influence of Dusts in Patients Suffering from Silicosis. B. Barhad and L. Petrescu. Arch. maladies profess. 23, 230-239 (1962).

A study was made of the phenomenon of diminution of respiratory amplitude when a subject passes from respiration in pure air to respiration in dust-containing air. It was found that, in parallel with the progression of the silicotic process toward more advanced stages, this phenomenon becomes more stable. This alteration is very constant and significant in patients suffering from third degree silicosis and controls. Another constant phenomenon is the increase in respiratory amplitude in silicotic patients as compared with controls. In the latter, the value of the ratio between duration of expiration and that of inspiration, when a subject passes from respiration in pure air to respiration in dust-containing air, presents a very distinct increase. In silicotics, this phenomenon, although present, is not stable and often even inverse reactions may be found. -- Public Health Eng. Absts.

463 Experimental Production of Mesothelial Tumours of the Pleura by Implantation of Dusts in Laboratory Animals. J. C. Wagner. Nature 196, 180-181 (Oct. 13, 1962).

To find out if mesotheliomas can be produced experimentally, various forms of asbestos dust were injected into the pleural cavities of animals. Samples of the dusts of crocidolite, chrysotile and amosite were used along with those of silica and of carbon black as controls. Chemical analysis of these dusts showed that oils and 3,4-benzpyrene were found in crocidolite dust but only to a slight extent in amosite dust and not at all in the other dusts. In this investigation, 106 rats had died from various causes or were killed within 30 months after injection. Four developed mesothelioma, 7 adenoma of the breast and 8 reticulum-cell sarcoma. Adenoma of the breast and reticulum-cell sarcoma occur naturally in laboratory animals; mesotheliomas do not occur in the strain of rat used. Two of the rats exposed to crocidolite dust, one exposed to chrysotile dust and one to silica dust developed mesotheliomas. A further rat, dusted with chrysotile in another experiment was found to have mesothelioma. These tumors were histologically similar to those found in human patients and they showed also the presence of hyaluronic acid. The occurrence of mesotheliomas after injection with chrysotile and silica dusts has yet to be explained. The author is continuing his investigations of the association between mesothelioma and asbestos dust. -- Bull. Hyg.

464 Inhibiting Effect of Ultraviolet Light on the Development of Silicosis in Experimental Animals.
Z. D. Gorkin, G. I. Evtushenko and I. S. Ostrovskaia.
Gigiena i Sanit. 27, 20-25 (Oct. 1962).

The authors studied the action of various doses of ultraviolet radiations on the development of the silicotic process in experimental white rats. The effectivity was assessed by the data of pathomorphological examinations of the lungs of the animals sacrificed 6, 9, and 12 months after the beginning of the experiment and by certain other indexes. In one series of experiments the absolute collagen content of lung tissues was determined. Besides, the phagocytic activity of neutrophilic leukocytes against Staphylococcus aureus was investigated. It was determined that ultraviolet radiations in suberythmic and small erythmic doses inhibit the development of sclerotic lesions in the lungs produced by quartz dust. -- APCA Absts.

465 The Problem of Dimensions of Miniature Chest X-Ray Films. C. Garavaglia.
Med. lavoro 53, 170-178 (Mar. 1962). Italian.

The author studied 10 cm. and 7 cm. miniature x-ray films, from the point of view of recognition of detail (by densitometric analysis) and of diagnostic value (by comparative examinations), and then compared the above to radiographs. As a diagnostic test he used the radiological picture of simple pneumoconiosis, subdivided into categories according to the International Classification. The conclusion reached as the result of the study, was that the optimal dimension for miniature x-ray pictures was roughly 10 cm. -- APCA Absts.

466 A Case of Pseudo-Tumoural Silicosis. A. Grieco and E. Sartorelli.
Med. lavoro 53, 359-370 (May 1962). Italian.

This paper, illustrated with radiographs, describes the case of a man aged 45 years who had been dry-drilling tunnels for 20 years; the free silica ranged from 35% to 50%. In addition to punctiform fibrosis, chest x-ray examination showed an opacity 5 cm. in diameter in the right lower lobe. It was sclerotic, rich in anthracotic pigment and did not resemble the histological picture of tuberculosis or Caplan's syndrome. The ashed residue contained 6% quartz. Resection of the affected lobe was carried out, but the patient subsequently developed a pleural effusion and tuberculous cavities in the left lung, from which he died. The authors consider the case to be one of silicotuberculosis in which the nodular mass was a tuberculosis lesion immunologically enhanced by silicosis; it is considered that the secondary cavity formation was caused by ischemic necrosis. -- Bull. Hyg.

467 Silica Powders of Respirable Size. II. Dissolution Rates in Dilute Hydrofluoric Acid.
I. Bergman. J. Appl. Chem. (London) 12, 336-341 (Aug. 1962).

As part of fundamental studies in silicosis research, the rates of dissolution in 0.1 M-hydrofluoric acid of size-graded powders of quartz, tridymite, cristobalite and vitreous silica, having particle diameters in the range 0.2 - 5.0 microns have been measured by a conductimetric micromethod. The rates of dissolution per unit area of the vitreous silica powders were an order of magnitude larger than those of the tridymite or cristobalite powders, and two orders of magnitude larger than those of the quartz powders. Quartz, unlike the other polymorphic forms of silica, showed an increase in rate (per unit area) with decreasing particle size as well as an increase in the relative amount of "easily soluble layer". These results are adduced as evidence against the "solubility theory of silicosis" and in favor of a biological activity dependent on the surface structure. -- Bull. Hyg.

468 Asbestosis and Tuberculosis—A New Aspect of the Compensation Liability.
H. Bohlig, G. Jacob and H. Muller.
Intern. Arch. Gewerbepathol. Gewerbehyg. 19, 434-449 (1962). German.

In both West and East Germany regulations provide for compensation for victims of silicosis and silicosis accompanied by tuberculosis. There is also provision for asbestosis victims but not where asbestosis is accompanied by tuberculosis. This position has not been

changed because of the conclusions drawn by Wedler (Lungentuberkulose bei Asbestose, 1947, Leipsiz: Barth) but in later years he has modified his opinion. The authors have, therefore, gone into the question anew and have accumulated a large number of cases. The particular conclusion of Wedler to be checked was that the accompanying tuberculosis ran a relatively favorable course independent of the degree of asbestosis and that it played no part in the occurrence and termination of an asbestosis. Up to the end of 1961, in the 613 known asbestosis patients, 40 of them had active tuberculosis, a proportion of 6.52%. Half of the 40 patients with the combined disease had died, 7 of tuberculosis. The total deaths in the 613 cases numbered 89. Tuberculosis was the fourth most frequent cause of death, after right heart failure, pulmonary carcinoma and carcinoma of other sites. The tuberculosis morbidity of asbestosis patients is higher than is generally admitted in Germany, but not significantly higher than that of the comparable age-groups of the rest of the population. An illustrative case of the combined disease is described. Treatment, including chemotherapy was not successful, and in this patient a mutually harmful influence was exerted by the two diseases. The authors press for this fact to be taken into consideration in individual compensation cases in Germany more than it has up to now. -- Bull. Hyg.

469 Comparison of Pneumoconiosis-Producing Properties of Silicon Structureless and Crystalline Asbestos Dust. K. Szymczykiewicz and E. Wiecek.
Med. Pracy (Lodz) 13, 85-97 (1962). Polish.

An amount of 40 mg. of silicon dust, structureless asbestos dust, and crystalline asbestos dust was introduced during ether anesthesia into the prepared trachea of guinea pigs divided into 3 groups (16 guinea pigs in each group). A different kind of dust was given to each group in 2 ml. of normal saline solution. The contents of colagene in the lungs as well as the SiO_2 in blood and lungs was estimated every 2 months. The lungs were subjected to histopathological examination. It was found that the pneumoconiosis-producing properties of the structureless asbestos are less than those of the crystalline asbestos as compared with the biological effect of the silicon dust. -- Public Health Eng. Abstr.

PHYSICAL ASPECTS OF THE ENVIRONMENT

470 The Physiological Adaptations to Heat-Stress with a Classification of Heat Illness and a Description of the Features of Heat Exhaustion. B. A. King and M. E. Barry.
S. African Med. J. 36, 451-455 (June 9, 1962).

Africans engaged in deep-level mining in the Orange Free State are working hard in hot and humid conditions. Air dry bulb temperatures vary from 86 to 96°F, with a relative humidity of 90 to 96%. Adequate replacement of fluid and electrolytes lost in sweat, maintenance of a steady work rate, and repeated checks on body temperature and physical stress by trained supervisors, keep down the incidence of heat illness. The heat disorders commonly encountered include heatstroke, heat hyperpyrexia, heat cramps and salt-depletion heat exhaustion, and prickly heat. The authors review briefly the whole question of acclimatization to heat and of heat illness, then proceed to consider the clinical features of salt-depletion heat exhaustion. They draw from their own experience and from the bedside and laboratory findings in their last dozen or so cases of salt depletion. These patients suffered weakness, apathy, nausea and vomiting, dizziness, and muscle cramps; they were found in general to have the signs of dehydration, orthostatic tachycardia and syncope, a low oral temperature, hemoconcentration, a high blood urea, low serum and urine chlorides, and oliguria. Intravenous therapy was aimed at replacing approximately 5 liters of fluid and 25 g. of salt, and normal saline was used for the first 2 liters. The prognosis of the disorder is good. -- Bull. Hyg.