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Thompson *et al.* found that the daily feeding of organic zinc salt solutions (acetate, citrate, and malate) or of zinc oxide suspensions in doses of from 2 to 38 mg. of zinc to albino rats, not only for many weeks previous to mating, but during pregnancy and lactation as well, did not have any significant effect on the health of the parents, on fertility, or on the health and early growth of the offspring. The offspring of zinc fed parents, weaned at 23 days of age and themselves put on daily doses of zinc, grow at a normal rate and to a normal adult size.

THE NORMAL EXCRETION OF ZINC IN THE URINE AND FECES OF MAN. K. R. Drinker, J. W. Fehnel, and M. Marsh. *Jour. Biol. Chem.*, March, 1927, vol. 72, pp. 375-383.

Drinker *et al.* present figures on the normal amounts of zinc present in the

urine and feces of a large group of healthy adults on an ordinary diet, the range and average of figures upon the total zinc content of twenty-four-hour specimens being as follows: urine, range 0.25 to 2 mg.; average 0.89 mg.; feces, range 2.67 to 19.9 mg.; average 9.8 mg.

In addition to providing data for the establishment of normal standards of zinc excretion in man, the observations reported prove that amazing increases in fecal zinc excretion may occur following the ingestion of high zinc foods—increases which may last for several days. The work indicates also that significant increases in the normal content of zinc in urine do not result from the ingestion on single occasions of high zinc foods but offer no evidence as to whether or not the normal urinary zinc level would be raised if foods unusually rich in zinc were continually ingested.

DUST HAZARDS AND THEIR EFFECTS

PNEUMONOCOONIOSIS CAUSED BY ASBESTOS DUST. *London Letter, Jour. Am. Med. Assn.*, July 23, 1927, vol. 39, p. 304.

At a conference of the Royal Microscopical Society, held at Liverpool, a case of pneumonokoniosis due to asbestos dust was reported by Dr. W. E. Cooke and Mr. C. F. Hill. It appears to be only the second reported in this country. The particles found in the lungs were large, some measuring as much as 360 microns. They represented the brittle iron containing part of the asbestos fibers. The dust contained 18 per cent. of iron as ferrous oxide, the raw material 2.1 per cent.,

and the finished article 0.1 per cent. The microscopic appearances of the dust were identical with those of the particles found in the lungs.—K. R. D.

THE EFFECT OF CEMENT DUST UPON THE LUNGS AND THE QUESTION OF TUBERCULOSIS AMONG CEMENT WORKERS. *Fraenkel, Hack, and F. Schott. Abstr. as follows from Zement*, 1926, vol. 15, pp. 126-128, 146-148, in *Chem. Abstr.*, Oct. 10, 1927, vol. 21, p. 3260.

Decades spent in the dust laden atmosphere of a cement plant did not lead to any dangerous disease of the lungs in 100 cases observed. The

severe conditions stimulated catarrh and dust impregnation which did not lessen the work or shorten his life or work.—P. D.

THE RADIOGRAPHIC PICTURE OF PNEUMONIC SILICOSIS, AND ITS DIFFERENTIAL DIAGNOSIS FROM OTHER AFFECTS OF THE LUNGS. P. F. Möller.

Arch. f. Klin. u. Exp. Med., July, 1927, vol. 8, pp. 193-204. The summary following this is as follows:

The author describes the radiological changes in chalcotic lungs—"porcelain lungs"—and points out the changes, from the moment the condition reached a certain stage of development, of a kind and character which will allow it possible to make the correct diagnosis, provided one possesses a film radiogram of the case. At the same

INDUSTRIAL PHYSIOLOGY

CHANGES IN WHITE BLOOD CELLS DURING WORK. A. F. Berg and M. V. Lepskaia. *Abstracts from Jour. de physiol. et de med.*, Dec., 1926, vol. 24, p. 715, in *Am. Med. Assn.*, June 25, 1927, p. 2054.

Goldberg and Lepskaia examined the blood of 300 healthy persons during physical and mental work; both the number of leukocytes increased, especially that of the neutrophils, which reached 82 per cent. lymphocytes and eosinophils were reduced; the eosinophils disappeared entirely when the work was prolonged. The number of basophils and of erythrocytes increased; neutrophil myelocytes, and Türk's cells appeared. The changes in the leu-

alveolar walls. A. Policard (Lyons) has combined two views in his hypothesis, that they come from the lining of the alveoli, and that this is mesodermal rather than epithelial. Dr. H. M. Carleton, of Oxford, has recently¹ reexamined the question in a variety of ways—histology, vital staining, tissue culture—and comes to the conclusion that dust cells are indeed derived from the cells lining the alveoli, and that these are epithelial in nature; in other words, he reaffirms the original interpretation. Phagocytosis by epithelial cells is not really so very uncommon, even in mammals; many cancers show an exaggerated degree of it. These epithelial dust cells are, perhaps, chiefly peculiar in their capacity for ameboid movement, for after picking up particles in the alveoli they will penetrate the lymphatics of the lung, and travel long distances in these vessels and to the bronchial glands.

✓ PULMONARY ASBESTOSIS. W. E. Cooke. *Brit. Med. Jour.*, Dec. 3, 1927, vol. 2, pp. 1024-1025.

The clinical history is given of a woman who was exposed in a factory to asbestos dust for eighteen years, before she ceased work in 1922. She then came under notice presenting signs of fibrosis of the right lung and tuberculosis; she died two years later. The lungs showed an enormous amount of fine granular pigment in peribronchial fibrous tissue, in the walls of alveoli and in phagocytes. Numerous particles of dust similar in size and shape to asbestos dust were to be seen; and in addition certain large

solid angular particles, quite unusual arising apparently from the dust.

Some short description is given of the use of asbestos during historical time; it has been known since the days of Herodotus. In composition it is a mineral mainly composed of hydrated magnesium silica. A chemical analysis yields about 43 per cent. magnesia, 40 per cent. silica, and 14 per cent. water. A certain amount of oxide of iron is also usually present; the iron appears as dark particles among the translucent asbestos fibers. The fibers may be of great length and fineness, so that cloth made with them can weigh less than 8 ounces to the square yard.—E. L. C.

✓ HISTOLOGY OF PULMONARY ASBESTOSIS. S. McDonald. *Brit. Med. Jour.*, Dec. 3, 1927, vol. 2, pp. 1025-1026.

This article is devoted to the histologic appearances seen in the case reported by Dr. W. E. Cooke. (See previous abstract.) Well-marked diffuse interstitial pneumonia was present with chronic bronchitis and some emphysema. There was also extensive pigmentation with signs of chronic phthisis. The typical whorled formations seen in silicotic lungs were not present. A distinctive characteristic was the presence of certain large fragments varying in size from 20 microns to 70 microns or even larger. These curious bodies look like organic structures with club-like extremities. They were submitted to pathologists, zoologists, botanists, and chemists; but no one could identify them. The hypothesis is advanced that these bodies are portions of asbestos fibers in the process of alteration and ab-

sorption by hydrolysis either by direct chemical action or by enzymes; but the exact nature of these foreign bodies remains in doubt. (Special plates are given of photomicrographs illustrating the papers by Dr. Cooke and Dr. McDonald.)—E. L. C.

CLINICAL ASPECTS OF PULMONARY ASBESTOSIS. T. Oliver. *Brit. Med. Jour.*, Dec. 3, 1927, vol. 2, pp. 1026-1027.

This article is a short note dealing with the same case as is reported by Dr. Cooke and Dr. McDonald; it follows the same lines as the article which appeared in THIS JOURNAL (1927, vol. 9, p. 483).—E. L. C.

EFFECTS OF COAL DUST UPON THE SILICOTIC LUNG. S. L. Cummins. *Jour. Path. and Bacteriol.*, Oct., 1927, vol. 30, pp. 615-619.

The occurrence of silicosis among those coal miners in South Wales who are employed driving roads in hard silica rock was reported in THIS JOURNAL (1926, vol. 8, p. 466) by Tattersall. An account is given in this paper by Prof. S. L. Cummins of the pathologic findings in the case of one of these miners who after being exposed to silica dust for four years at machine drills was subsequently employed as a coal miner at the face. Neither during life nor after death were tubercle bacilli found. On chemical analysis the lungs were found to contain a little over 10 per cent. of ash of which 1.4 per cent. was composed of silica. Ash from the lungs of an

¹ Carleton, H. M.: *Quart. Jour. Micros. Sci.*, 1927, vol. 61, p. 223.

solid angular particles, quite unusual, arising apparently from the dust.

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ordinary adult gave only 3.2 per cent. ash with an inconsiderable amount of silica. Microscopically the lungs exhibited definite and characteristic fibrosis; in addition, a great accumulation of pigment originating in coal dust was found, so much so that the upper parts and surface of the lungs felt and looked like coal. Many dust bearing macrophage cells were to be seen in the fibrotic tissue, carrying particles of coal dust. Others had disintegrated leaving their burden of coal dust behind. The writer compares the occupational exposure of the patient to that obtained on animals by Mavrogordato who exposed guinea-pigs first to fine silica dust and subsequently to fine coal dust. The findings closely followed those now reported. The suggestion is put forward that the lungs were first damaged in their lymph drainage by the fibrosis; subsequently coal dust became entangled there which would have been eliminated from normal healthy lungs. The result was that coal dust, which is usually considered a harmless dust, so accumulated in the lungs that it accentuated the preexisting silicosis sufficiently to lead to death.—E. L. C.

A NEW KONIMETER. R. A. H. Flugge de Smidt. *Jour. Chem., Metall. and Min. Soc. So. Africa*, Oct., 1927, vol. 28, pp. 78-80.

A brief description, with illustration, is given of a circular konimeter with microscope attached, designed by the Carl Zeiss Co., Jena.—P. D.

HYGIENE

mechanical system of ventilation perfect, is capable of the wholesome and healthful of the outdoor atmosphere; the spring and fall is vital property in the, is a matter of conjecture electrical, physical, or

conclusion of the Committee effect that respiratory ailments is chiefly caused by or temperature is not his study. The author believe that it may be a greater volume of air through the rooms, which evaporation from the noses pupils to respiratory. Further studies will be prove this hypothesis. Assured by the author's how impartiality in controversy of long concludes in part:

data had been based on foundation of diagnosis by competent persons, follow-up of absentees been the possibility of falsification, absence, and had the duals included in our, we should be wary of unqualified assertion primary study strongly at natural ventilation true which mechanical not possess, or that on involves some harmful natural ventilation

as the reader against fluctuations from this

to know that these continued under im- with the promise of
s.—C. P. Y.

J. I. H.
Dec., 1925

SUBJECT INDEX TO VOLUME X

This is a subject index to all the reading matter in the ABSTRACT OF THE LITERATURE OF INDUSTRIAL HYGIENE, and one should, therefore, look for the subject word. The name of the author follows the subject entry in parenthesis.

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