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pebbles of quartz, quartzite and chert in a granular quartzite matrix; free silica forms 80-90 per cent. of the conglomerates and quartzites. The data are of value in view of the important position occupied by the Witwatersrand in the literature on silicosis. Five references are given.

It is impossible to include a review of the discussions at these meetings; they were at a very high level and form a critical survey of the subjects presented in the papers and would repay careful study. This volume is recommended as a valuable addition to the current literature on pneumoconiosis, especially in the practical application of methods of dust control in mines.

*E. L. Middleton*

**CENTRAL MINING—RAND MINES GROUP. HEALTH DEPARTMENT. Report For the Year 1947**  
[ORENSTEIN, A. J., Chief Medical Officer]. 18 pp., 2 folding charts & 1 folding plan.

The Report deals with the health of a male African population employed by the Group and averaging about 91,000, nearly all between the ages of 18 and 30. They are recruited by a special organization, and a selective examination is made before they are drafted to the mines, where they work for a contract period, usually 9 to 12 months, after which they return to their villages. About 80 per cent. of them are employed underground in the mines. Annual labour turn-over is about 90 per cent.

There is an impression among the mine medical officers that a larger proportion than formerly of men of poor physique is being recruited, and this is supported by an increase of shifts lost through illness, without corresponding increases in the ratio of patients treated in hospital, length of stay in hospital, or of deaths. Further, while the percentage rejection for poor physique remained near the average, over the preceding three years, for natives of the Union, it has decreased markedly for Basutos and Bechuanas, which points to a possible lowering of the standard of physique at recruitment.

The mortality rate from disease reached a record low level, at 2.99 per 1,000, which is one-tenth of the death rate for all diseases in 1911. Pneumonia shows an increased incidence, at 33.72 per 1,000, but a lower case mortality, at 1.69 per cent., owing, probably, to a preponderance of mild cases, as well as to improved therapy. There were 218 cases of pulmonary tuberculosis, incidence 2.39 per 1,000; 50 died from this cause, case mortality 23.04 per cent.; 168 were repatriated. Silicosis is not predominant among the African labourers, owing to the limited periods of employment of the great majority; there were 58 cases of the disease, with or without tuberculosis; of these four were fatal and 53 patients were repatriated. Influenza, most prevalent of serious diseases, showed an increased incidence, at 33.08 per 1,000, but the case mortality, of 0.6 per cent., was not raised.

Occupational therapy, better termed diversional therapy, has been introduced in the large hospitals. Patients work in raffia, papier mâché, clay and textiles, and generally like the work.

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An interesting experience is recorded of the use of settled, but not filtered, sewage effluent in the cultivation of vegetables, where uncertain rainfall must be considered. At one mine, employing 20,000, the average consumption of vegetables from 1936, was nearly 3 million pounds per annum, and, during the period, there was no unusual prevalence of intestinal diseases, and the enteric rate corresponded with that of the other mines in the Group. A similar result was experienced at another mine employing 8,000. The vegetables are cooked for 30 minutes in a thick soup, but some carrots, when available, are eaten raw.

*E. L. Middleton*

**BOARD OF TRADE. German Industry. F.I.A.T. Final Report No. 1070. Technical and Scientific Developments related to the Asbestos Industry in Germany. 42 mimeographed pp., 7 figs. 1947. Mar. 23. London: H.M. Stationery Office. [4s. 6d.]**

This report is a description of the machinery and installation of the German asbestos industry which is considered to be of interest to American industry, and is a supplement of previous reports especially Fiat Final Report 460 and Bios Final Report 404, Item 22. The main problem for the German asbestos industry is regarded at present as one of lack of material, in which the British Zone is not so badly off as the American. The report consists broadly of three sections, one dealing with industrial plant, another with problems of dust control and a third with some experiments made by German scientists during the war to prepare a synthetic asbestos. The present position with regard to the plant and installation is solely an engineering problem. The preparation of a synthetic product has been held up by the collapse of German industry, and not a great deal appears to be known about it, but the basic idea seems to have been "gelling" of sodium silicate with hydrochloric acid, washing out of the gel to remove NaCl by liquefying it under steam pressure, evaporating the sol to 14 per cent. SiO<sub>2</sub> with the addition of 5-10 per cent. sugar, introducing a spinning process, and finally ageing the fibre, washing the sugar residue and drying. The section on dust control has a direct bearing on general industrial hygiene.

For many years before the war, insurance (*Berufsgenossenschaft*) against the risks of dust and accidents was compulsory. The use of respirators was recommended only in extreme cases, reliance being chiefly placed on an efficient dust control organization. The report gives a translation of the Regulation for Dust Prevention in Asbestos Processing Plants issued by the German Government in 1940. This lays down general engineering precautions for dust control, with detailed instructions as to the protection of machines and the provision of exhaust equipment. [Many of these are already in use in Britain, but the details are too technical for abstraction.] An official centre for advising on dust prevention, especially in the case of the installation of new plant, was provided by the Government. Children under the age of 18 were not considered suitable for dusty occupations

[no details are given, however, as to the regulations for their exclusion]. It was forbidden to eat, or to remain, in dust-endangered rooms during rest periods. Outdoor clothes were not to be kept in workrooms and work clothes had to be cleared at regular intervals [time not stated].

The writer of the report also interviewed Dr. Luise Holzapfel who had had charge of an organization in Berlin for the investigation of silicosis problems, before the collapse of Germany. She stated that she and her staff had been engaged for some time on the isolation of organic silicon compounds. Two important ones had been discovered, but their chemical composition had not been completely determined when the war ended. One was a silicon compound of the lipid group obtained from the lungs of patients suffering from silicosis accompanied by tuberculosis, the other was a Si-N compound present in normal blood. The isolation of these compounds had been extremely tedious, taking from 2 to 3 years and when the Russians took over that section of Berlin they had ordered the destruction of all material on the ground of risk of infection. Dr. Holzapfel considered that there was no risk of tuberculosis provided that silica metabolism in the body was normal, and she regarded disturbed fat metabolism in undernourished workers as a predisposing cause of tuberculosis. She was of the opinion that the compound isolated from healthy blood might have some therapeutic value both in tuberculosis and tuberculo-silicotic patients. The striking resemblance between the tissue of a silicotic lung and vulcanized rubber suggested to her the presence of long-chain organic silicon oxygen compounds, probably formed when the fresh surface of quartz grains reacted with some unknown constituent of the blood. The presence of oxygen was necessary, she believed, for that reaction to take place and she further expressed the view that "a compound in which the silicon atoms are completely surrounded by organic radicals probably cannot cause silicosis because such a compound will be insoluble and unreactive". Dr. Holzapfel had tried to cultivate the tubercle bacillus on  $\text{SiO}_2$  gel containing various nutrient substances, but without success.

The writer of the report states that further information on the two substances mentioned can be obtained from the Kaiser-Wilhelm Institut für Silikat Forschung in Berlin-Dahlem. The substance formed in normal blood had 1.3 per cent.  $\text{SiO}_2$ , 6.5 per cent. N, but no iron or cholesterol; it was water-soluble, strongly alkaline, with a melting point over  $250^\circ$  [presumably Centigrade] and had been isolated from the lecithin fraction in the blood. The second was a water-insoluble substance from the lung tissue, and could be concentrated in the ester fractions. The lecithin compound, on the other hand, was almost completely absent from lung tissue. In silicosis the melting point of the extracted mixture of ester-free fat was found to increase in relation to the severity of the disease. Early cases of silicosis yielded a mixture melting at  $45^\circ$  whilst the material extracted from more advanced cases melted at  $72-81^\circ$ . Extraction of silicotic lungs gave a higher proportion of

lipoids (esters, free fatty acids and phosphatides) than was obtained from healthy lung tissue.

S. Roodhouse Gloyne

MILLMAN, N. Pneumoconiosis due to Talc in the Cosmetic Industry. *Occupational Med.* Chicago. 1947, Oct.-Nov.-Dec., v. 4, No. 4, 391-4, 1 fig.

A case is reported of a man, aged 55, who had been employed for 24 years in the talcum powder mixing rooms at two factories. There were three machine processes: sifting, mixing and pulverizing, and no mechanical ventilation was provided. Dust counts in the general room atmosphere gave 15.9 million particles in a cubic foot; at the mixer the count was 236 millions, and at the pulverizer, 133 millions. Analysis of the mixed talcum powder showed free silica content less than 0.5 per cent. Microscopic examination of the talc, which was a western type, did not reveal any sharp spicules such as have been described in tremolite talc.

The only complaint referable to the chest was occasional pain, and there was some general weakness. There was nothing of significance in the history or physical examination. X-ray examination revealed nodular densities, from 1 to 3 mm. in diameter, throughout both lung fields, and thickened pleura between the upper and middle lobes of the right lung.

This man had no previous occupational exposure to any dust, and the elimination of silica and asbestos as possible causes of the pneumoconiosis in this case leads to the conclusion that prolonged exposure to high concentrations of talc dust is capable of causing generalized pneumoconiosis of the nodular type.

E. L. Middleton

DUNNER, L. Observations on the Development of Graphite Pneumoconiosis. *Brit. J. Radiol.* 1948, Apr., v. 21, No. 244, 182-5, 3 figs.

This paper is an extension of previous work by the author on the lungs of graphite workers [DUNNER, L., this *Bulletin*, 1945, v. 20, 682 and DUNNER, L. and BAGNALL, D. J. T., *Brit. J. Radiol.*, 1946, v. 19, 165]. It consists of clinical records and radiographs of three patients, one with 36 years' exposure to graphite who has remained well in spite of a temporary breakdown in 1933, one with 4 years' and no complaints of illness, and one with 18 years' whose record was included in one of the author's previous communications. The general condition of these graphite workers seemed good, but the author has noted from previous experience that signs of deterioration may follow in due course, even to the extent of unfitness for work, as a result of dyspnoea, bronchitis and general debility. The paper contains serial radiographs of the cases and these are discussed in some detail. From his records of this disease, the author points out that there is a type of graphite pneumoconiosis with the "snowstorm" pattern of X-ray picture. From this radiograph some quite different appearances may follow. Thus, shadows bigger than those of the "snowstorm" mottling—and even