

FILE NAME: German Articles - Some with English Translation (GER)

DATE: 1932 June

DOC#: GER052

DOCUMENT DESCRIPTION: Article from Medical Journal - Pulmonary Asbestosis - English

INDUSTRIAL HYGIENE.

HYGIENE, DISEASES AND ACCIDENTS OF
SPECIAL INDUSTRIES AND OCCUPATIONS.

GERBIS & UCKO. Ueber Asbestosis der Lungen.
[Pulmonary Asbestosis.] *Deut. Med.*
Woch. 1932, v. 58, 285-7.

KHAUM, A. Das Staubproblem. [The Dust Problem.] *Mitt. d. Volksgesundheitsamtes.* 1932, No. 3, 20-27. [18 refs.]

The author gives the results of a visit to the United States, thanks to an invitation from the Rockefeller Institute, to study medical and technical aspects of industrial health problems. He spent some time participating in the work carried on in Professor Drinker's applied physiological laboratory at the Harvard School of Hygiene. He states Drinker's classification of dusts as follows:—

(a) Dust, the particles of which vary from 150 down to 1 micron and may be of the most varied character.

(b) Dust mist (fumes), of size varying from 1 to 0.2 microns arising from distillation, complete or incomplete oxidation of metals, and from chemical reactions, e.g., ammonium chloride, lead, zinc, etc.

(c) Smoke, of size less than 0.2 micron arising usually from incomplete combustion of coal, oil, tar, tobacco, etc. The author describes the methods in use in Drinker's laboratory, for analysing and measuring dusts by (1) precipitation, (2) filtration, (3) washing out, (4) impingement, (5) electrical filtration, (6) photometry, by special stress on electrical filtration and photometry. The results achieved are referred to in the determination of the threshold dose of substances giving rise to metal fumes fever, as e.g., from zinc oxide, and the amounts of inhaled dust which are retained.

Much space is given to consideration of mineral dusts especially of siliceous dust. He lays stress on the importance of fixing standards of the amount of specific dusts permissible in the air. Credit is given to America for certain standards. Thus he says that in various States the highest permissible limit for granite dust is fixed at 10 million particles per cubic foot, for quartz and sandstone at 5 million particles, while for less harmful dusts, such as limestone, other figures are permitted.

Lastly preventive measures are briefly reviewed. The author covers a wide field; the references to his paper show that the literature he directs attention to has practically all of it from time to time been made the subject of abstract in this *Bulletin*. T. M. Legge.

The authors have examined 33 asbestos workers in the Deutschen Asbestwerken A.-G., of whom 18 were females and 15 males, between the ages of 20 and 65. Only two of these workers had been employed for more than 15 years, viz., one woman for 17 years and one man for 32 years. A table is given showing the age, number of years employed in the asbestos factory, and the stage of the disease in these 33 workers. The workers examined were those who were specially exposed to the dust or those who complained of symptoms.

Nearly all the patients examined showed symptoms which might be expected of such a lung disease, e.g., cough and sputum, dyspnoea, especially on exertion or in foggy weather, 16 complained of lack of appetite, 10 had loss of weight, 5 had pain on breathing, 5 had palpitation, others complained of faintness and of increasing pallor. Cough occurred in 23 cases. The sputum was tenacious, scanty, generally mucoid and occasionally mucopurulent.

Previous history included pulmonary catarrh in four cases, pleurisy in two, and in one case peritoneal tuberculosis. In only one (a female) was there any family history of tuberculosis and the authors state that they can trace no close connexion between asbestosis and tuberculosis.

The general condition of the patients was poor. Clinically in ten cases percussion and auscultation of the lungs gave no significant findings. In the remainder there were signs of bronchitis, frequently with peculiar, coarse, indeterminate breath sounds. The X-ray picture showed in 13 cases no definite changes attributable to asbestosis although six of them had bronchitis. In three cases well-marked X-ray changes were present without clinical signs on auscultation and percussion. The well-recognized X-ray picture of silicosis with the snowstorm effect or tumour-like shadowing was not seen. In one patient, at the right base, near the asbestotic changes, were nodules. This man, had, however, worked in a weaving factory where he was exposed to the dust of kieselguhr as well as asbestos, so that a mixture of silicosis and asbestosis was present. In the early cases there was an increase of the fine reticulation of the lung with fine mottling. In the second stage this reticulated appearance was thicker, and showed numerous diffuse mottled shadows in which the bronchial branching appeared to stand behind the network. In

this stage the characteristics of the asbestosis were already clearly recognized. They were present mainly in the lower part of the lung fields. There were very rarely important changes in the hilum of the lung. Diaphragmatic changes take place early and in the peripheral outer parts and in the centre. In the early stages fine mottling was present, such as is not seen for example in bronchitis and bronchiectasis. In the third stage the different findings were very marked. A cloudy veil occurred with a white faded-looking mottling. In the most advanced stage the shadows appeared moderately dense. Shadows due to calcification the authors do not regard as part of the picture of asbestosis. The authors confirmed in a few cases the findings of the Dresden workers, i.e., that in advanced cases it was no longer possible to differentiate clearly between the cardiac and diaphragmatic margins.

With regard to age, the severity of the disease did not appear to be dependent on the age of the worker, but, on the contrary, on the "employment age" (i.e., the number of years the workers have been in the factory), and on the amount of asbestos dust inhaled, which varies considerably in different processes. The authors found that in every instance where a patient had been working for more than ten years, asbestosis could be demonstrated radiologically. Personal disposition also appeared to play a part in the production of the changes.

Of diagnostic importance was the finding of asbestosis bodies in sputum, in lung puncture fluid, or *post mortem* in material from the cut surface of the lung or in sections of the tissue. The authors quote the views of Beintker and Timmermans to the effect that the bodies arise through the deposition, due to the solution of the asbestos, of a colloidal form of liberated silicic acid on the central core of the asbestos fibre. With potassium ferrocyanide and dilute hydrochloric acid the bodies give the prussian blue reaction.

The marked discrepancy between the clinical appearances and symptoms on the one hand, and the X-ray picture on the other, the authors regard as a characteristic peculiar to asbestosis. Even in the most severe cases asbestosis did not give as marked a picture as that of silicosis; indeed in the third stage of asbestosis there was present only a degree of shadowing which in silicosis would have little clinical significance.

It is probable that in asbestosis the silicic acid acts as a chemical irritant which leads to fibrosis. It has been demonstrated that connective tissue is especially sensitive to the action of silicic acid and it is suggested that when the silicates of the asbestos are dissolved in the lung tissue, silicic acid is liberated; the

latter is then taken up by the connective tissue and stimulates increased growth. This absorption may possibly be further promoted when more strain is put on the tissue by the act of respiration; probably herein lies the explanation of the fact that parts of the lung are specially affected. With regard to the severity of the disease the authors assume that a constitutional factor is important. (Keloidosis, SCHRIDDE [this *Bulletin*, 1929, v. 4, 1039]), and believe that on some factor of this kind the extension of the disease is dependent.

The authors think that the statement that asbestosis is formed on the soil of a tuberculous infection is contradicted by the facts. It is well recognized that the asbestosis patient has an increased sensitiveness to acute inflammation of the lung and bronchopneumonia, which gives rise to a bad prognosis. In conclusion they summarize their findings by the statement that asbestosis is a serious specific occupational disease which is well differentiated from other illnesses and which is easily diagnosable by consideration of the occupational history. Radiologically asbestosis shows a widespread uniformity with changes which KOELSCH and LEDERER have found in plate glass grinders. The X-ray appearances produced by asbestos as well as those of diseases produced by glass dust may be distinguished from silicosis by the term "silicatosis." S. Woodhouse Gloyne

BIGLER, M. Ueber die professionelle Schwerhörigkeit in ihren rechtlichen Beziehungen zur Unfallversicherung. [Occupational Deafness in its Legal Relationship with Accident Insurance.] *Schweiz. Med. Woch.* 1932, Feb. 20, 179-86. [37 refs.]

As a result of modifications and extensions of the Swiss law on Workmen's Compensation for accidents the author takes the opportunity of pressing for inclusion in these extensions occupational deafness. In doing this he makes much use of the fact that Germany has already done so in the case of deafness occurring in the metal industry. The subject is dealt with from the point of view of (1) anatomy, (2) clinical examination, (3) principal industries concerned in its production (metal, textile, railway, telephone, sawmills, etc.), (4) diagnosis, (5) statistics, (6) determination of the extent of incapacity, (7) preventive measures.

Statistics are quoted showing for boiler makers that between 20-40 years of age 27 per cent. suffer from slight and 7.5 from marked deafness whereas between 40-60 the proportion is 14.3 and 87.5 per cent. These are the figures given in the original paper; it will be seen that