

REPORT ON THE "INTERNATIONAL SYMPOSIUM ON PNEUMOCONIOSES" IN SHENYANG, CHINA, 30 MAY–2 JUNE 1988

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The first symposium on pneumoconioses to be held in China was organized by the Institute of Occupational Medicine, Chinese Academy of Preventive Medicine, Beijing, China (Professor Li), the Shenyang Research Institute of Industrial Hygiene and Occupational Diseases, Shenyang, China (Professor Zhao), and the Medical Institute of Environmental Hygiene at the University of Düsseldorf, West Germany (Professor Schlipkötter). Of the 150 participants attending, 127 came from 20 different provinces in the People's Republic of China, and 23 came from 8 European countries, the USA, Japan and the WHO. A total of 74 read papers and 34 poster papers were given, on the following subject areas:

- Technology of Dust Prevention and Dust Measurement
- Epidemiology
- Etiopathogenesis and Pathology of Pneumoconioses
- Diagnosis
- Therapy.

On the first of these subject areas, reports were given of the results of person-related dust exposure measurements to supplement stationary dust measurements in order to get a better view of the personal dust exposure, which can vary very widely. The measurement strategies used in the European countries and in the USA were described and discussed, i.e. the frequency and location of gravimetric sampling and the techniques and different types of equipment used for taking the samples, including tyndallometer methods for measuring dust concentration. The basis used here remains the Johannesburg Convention and the ISO definition for measuring and assessing respirable (alveole-penetrating) dust, as was also clear from findings reported here from animal trials. The measurement of inhalable total dust (with particle sizes up to over 100 μm aerodynamic diameter) as practised hitherto in China and the gravimetric measurement of asbestos dust at workplaces were critically discussed. The problems of measuring the quartz content as a guide parameter of the fibrogenic risk of different dusts were discussed, and the importance of the surface properties and lattice structure properties of the quartz or dust particles was pointed out. Detailed reports were also given on measurement of welding fumes, on engineering methods of controlling dust in coal mines, and on person-related dust protection methods.

On the second of these subject areas, papers were read and discussed on epidemiological studies in coal mines, in the asbestos industry, and in workers exposed to flax dust and to

welding fumes, and on the incidence and development over time of silicosis, asbestosis, lung cancer, mesotheliomas and allergic disorders. One of the objectives in China is to establish permissible limit values for various substances and to adopt internationally recognized measurement methods, in order to be able to make international comparisons of epidemiological findings. By applying dust control methods, and also in particular by treating cases of tuberculosis, it has been possible in, e.g., the tungsten mining industry to prolong average life from 36 years (1956) to 58 years (1987) in cases of silicosis or silicosis/tuberculosis.

On the next subject area, the aetiopathogenesis and pathology of pneumoconioses, the importance of the particle deposition and particle clearance rates for the aetiology of pneumoconiosis were noted. Also the bronchoalveolar lavage (BAL) was emphasized as an important parameter for assessing the course of a pneumoconiosis. Here, important factors are the total number of lymphocytes, the ratio of the individual lymphocyte populations, and evidence of mediators. In addition to the BAL findings, reports were given of serological changes occurring in silicosis, some of which affect humoral defences or are of interest as autoimmune phenomena: elevated levels of coagulase, fibronectin, interleukin I, phospholipids and complement complex C3, and also of lysozyme, angiotensin-converting enzymes, circulating immune complexes and anti-nuclear antibodies. These serological changes can be almost completely inhibited by administering silicosis-effective substances such as PVNO and Tetrandrin.

As special histological characteristics of silicosis, attention was drawn not only to the criteria already mentioned but also to the deposition of collagen types I & III and fibrinogen as markers for the fibrotic process, and to multiplication of collagen type IV and laminine as indicators of blood vessel proliferation. Reports were given of studies on the use of (compressed-air) gun-placed concrete at high pressure in tunnel building and the effects—especially of the quick-setting additives used—in animal trials.

In the subject area of diagnosis of pneumoconioses, parameters suitable for early diagnosis of asbestosis were reported: bibasal crepitation as an indicator for alveolitis, siderocytes in the sputum, and presence of asbestos bodies and fibres as indicators of exposure. The reduced elasticity of the lung due to interlobar and perivascular fibrosis causes

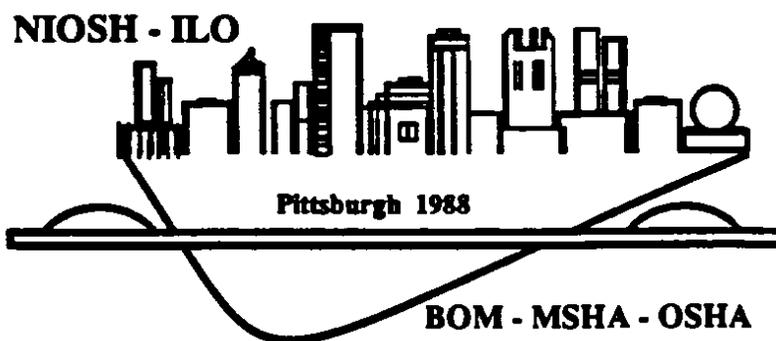
disorders of lung perfusion and thus a restrictive insufficiency of ventilation with reduced gas exchange, even in the earliest phase of the disease. A computer aided system of classifying pneumoconioses was also described, and the benefits of computer radiography and computer tomography were described in detail. The importance of studies which collect data on miners starting before they ever go underground was emphasized, so that early and also short-term effects can be detected. Regarding X-ray diagnosis of pneumoconioses in China, it is important to note that from 1986 onwards, Chinese X-ray diagnosis complies with the ILO classification of 1980.

On the subject area of therapy, several authors reported on successes with inhalation and injection therapy with polyvinylpyridine-N-oxide (PVNO) in silicosis patients. Chinese

participants presented clinical trials on also additionally administering derivatives of Piperquin and aluminium, covering more than 3000 cases treated. In vitro studies have shown that aluminium, zinc, nickel and cadmium likewise have a protective effect on the cell surface of macrophages against quartz. The same effect is reported from a Chinese anti-silicosis drug "Reduquin." The opinion held hitherto, on the basis of previous studies, that Tetrandrin in vitro has a cytotoxic effect on macrophages, has been contradicted by new studies showing that Tetrandrin markedly inhibits the quartz-induced cytotoxicity against macrophages, as measured by oxygen consumption, superoxide anion release, and hydrogen peroxide release. The progress made in the therapy of silicosis as outlined in these studies is of especial importance in China, where there is still a high incidence of new cases of progressive silicosis.

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II



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