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INDUSTRIAL HEALTH

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Air Conditions and Health

A Recent Survey of International Literature

Editor's Note—In Information Circular No. 6439 of the Bureau of Mines, issued February, 1931, Dr. R. R. Sayers, the Chief Surgeon, has made a summary of recent international literature on the subject "Effect on Workers of Air Conditions." An abstract of this material will appear on this page in four installments: I. "Dusts." II. "Toxic or Noxious Gases." III. "Abnormal Temperatures and Humidities." IV. "Summary and Bibliography."

I. Dusts

THE control of dust and dust diseases has continued to be a matter of considerable concern with most of the industrial companies of the world. This is indicated by the following summary of reports, which have been published in a number of foreign countries, as well as in the United States.

Australia. The report of the Workers' Compensation Commission provides information in regard to 1,300 of the 1,500 workmen examined up to August 23, 1929. In substance, this gives the number of men exposed in different dusty trades, who contracted tuberculosis, silicosis, and both diseases. In most instances the period of exposure was also noted.

The Broken Hill experience is rather unusual; during the period of the last eight years, the appearance of the first case of pneumoconiosis is still awaited.

George who reports this above experience feels that two factors operate in the development of pneumoconiosis in a miner. He maintains that there is a tuberculous element in every case of dust disease, even in so-called "simple" pneumoconioses and supports this idea by calling attention to the fact that of many men

exposed to exactly similar conditions only a percentage are affected by dust. A large percentage of the men with so-called "simple" pneumoconiosis have developed so-called "overt" tuberculosis, even when removed to surroundings where it is most unlikely they would be reinfected by the tubercle bacillus. Furthermore, in most radiographs of so-called "simple" pneumoconiosis, an area suspicious of either healed or incipient tuberculosis can be recognized, if a careful search is made for it.

Chapman believes that in some individuals, particles of silica are absorbed in the lungs without giving rise to silicosis, while in others, the particles are not absorbed but give rise to inflammatory areas starting silicosis. This leads him to believe that the inflammatory process occurs in persons who are already the subject of tuberculous inflammation. A further essential difference is found in the fact that early tuberculosis tends to attack the apices of the lungs, this portion tending to be the last attacked by silicotic inflammation.

England. Bridge gives credit to Collis in originally drawing attention to the effects of the inhalation of occupational dust containing free silica, but states that even he did not visualize the widespread nature of the industries in which free-silica-containing dust occurs.

Few if any, dusts occur in industry that will not produce, at least in certain individuals, an inflammatory condition of the skin; the economic results from this, however, are as nothing compared with cancer of the skin produced by dust.

Of increasing importance to the mining communities, according to *The Colliery Guardian*, is the occurrence of cases of silicosis in coal miners. Investigations of shales in the vicinity of coal seams and the quantity and nature of dust suspended in the air in underground places where drilling is carried out, will probably be shortly undertaken by Birmingham University.

The Lancet emphasizes the difference in the fibroid reaction resulting from exposure to asbestos dust and that to silica dust as encountered in gold mines. The former shows in the radiogram, fine basal mottling and linear striae, whereas the latter shows scattered dense rounded opacities. According to Professor Matthew Stewart, a characteristic finding is the so-called "asbestosis" bodies in the sputum of workers suffering from the disease.

France. The only item of interest in this country is the issuance of a decree by the French Ministry of Labor in November, 1929, which obliges doctors to make notification of pulmonary affections caused by dusts of silica, lime, clay, or coal. The object of this is to obtain information as to the incidence of this type of difficulties. Feil believes that the decree should be modified to require notification of silicosis only.

Germany. In general, German investigators consider occupational dust the most important subject of industrial hygiene and that dust stands in first place as a cause of occupational disease.

Jötten-Münster summarizes the investigation carried out by the Government Research Division of the Institute of Hygiene, University of Münster, Bochum, Germany, in stating that the severest experimental

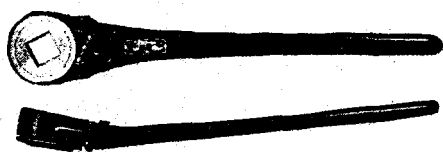
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NATIONAL SAFETY NEWS

May 1931

MR. SAFETY ENGINEER

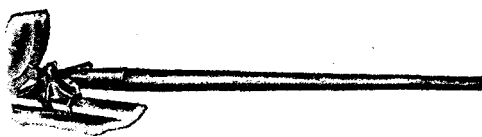
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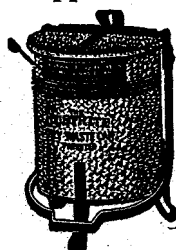


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Industrial Health

(Continued from page 46)

changes were observed to be caused by steel grinding dust, the next by dust of high silica content, such as rock dust (with clay slate) and porcelain. Coal dust and lamp black had a moderately injurious effect, while cement, limestone, Thomas slag, textile, and tobacco dusts were still less injurious, with lime dust in the form of calcium hydroxide the least harmful.

A difference of opinion occurs among German investigators on the effects of dusts. Hollman of Solingen believes that tuberculosis should not be regarded as an occupational disease since its course is not more severe and the fatality not higher among grinders than among other industrial workers. There appears to be an individual constitutional disposition toward pneumoconiosis, the preliminary conditions of which have not been satisfactorily investigated in a scientific manner. As a preventive procedure, X-ray examinations and investigations should take place in dusty industries every two or three years. The most important problem is prevention and this can be accomplished by the reduction of the dust hazard and controlling the spread of tuberculous infection.

Von Döhren thinks that individual disposition toward the development of pneumoconioses is important and that the measure of this has not yet been indisputably determined. The time required for the development of pneumocotic changes is extremely varied.

According to Sternberg there is still a wide differentiation between the findings of industrial dust-lung and the results of animal experimentation. This is explained on the basis of the anatomical-physical difference between human and animal tissue, the long period of time required for the development of a dust-lung in man and other considerations.

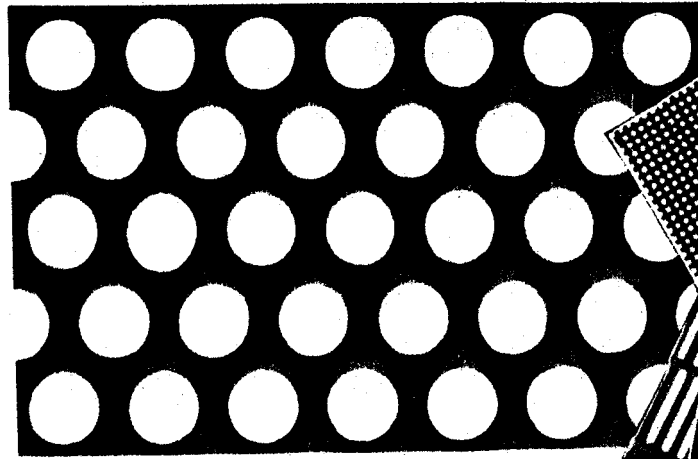
Grünwald thinks that most workers disregard the first results of the action of dust, believing that slight cough, sneezing and catarrh are necessary evils of the occupation or inherited weaknesses of their families. Frequently such minor changes go on to deep-seated conditions of the lungs. The significance of dry dust as related to the origin of an infectious disease, is not that it is a

carrier but because it is a physical and chemical active preparatory irritation for retaining the tuberculous infection.

Russia. Various investigations have been carried out by the State Institute for Occupational Pathology and Industrial Hygiene of Ukraine. Porcelain dust was easily hydrolized when introduced into the animal organism, and caused local necrotic lesions and toxic effects of the internal organs. Crystalline kinds of silicate dust were not hydrolized; schamotte stood between porcelain and dust and flint and sand so far as hydrolytic properties were concerned; coal dust was not soluble; charcoal dust showed no observable picture of solubility and tissue reaction; marble and gypsum dust were hydrolized and tuberculous lesions determined around the foci of these dusts.

South Africa. The experience of this country can be very well summarized in the words of Irvine and Mavrogordato as follows: although it is believed that we have turned a big corner in the matter of silicosis, it is not anticipated that the actual number of cases detected will show any significant decrease in the immediate future. After years of hard work on the part of mining engineers, medical men, and others, a large measure of success has been attained, but it is incomplete. When in 1916 we found that the liberal use of water, suitably applied, would reduce the dust from drilling or blasting by 97 or 98 per cent by weight, the problem appeared to have been solved. It has been solved only so far. The question which we now ask is, could we not do better with less water and a greater extension of alternative methods?

In August, 1930, an International Conference on Silicosis was held at Johannesburg, South Africa, attended by representatives of the principal countries interested in this disease. Summarizing the results, Hall feels that although no material addition was made to pre-existing knowledge, it served the purpose of collecting together all the available information about dust diseases from all parts of the world; it showed the position of the gaps in our knowledge, pointing the way to future research; it made possible an agreement on standards for international research; and finally it emphasized the urgent necessity for further experimental in-



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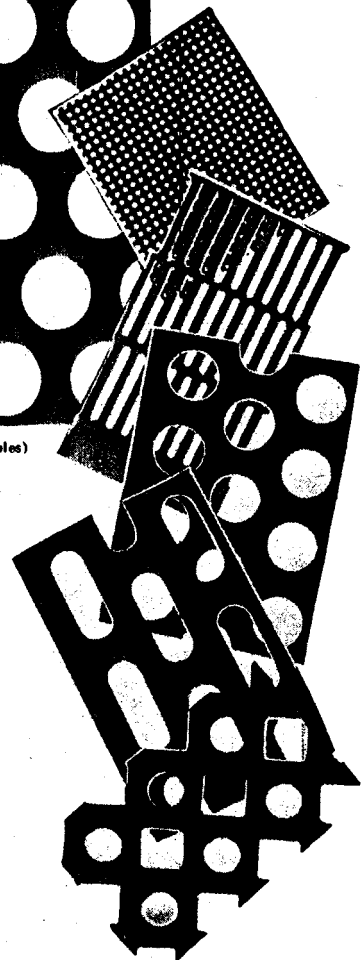
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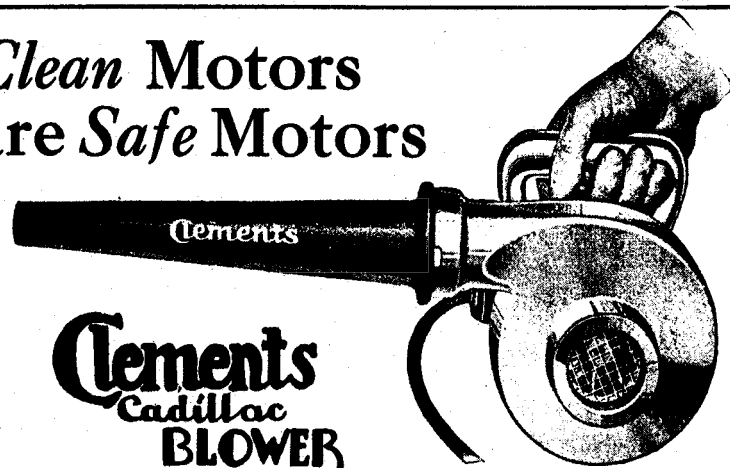
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