

FILE NAME: Goodyear (GY)

DATE: 1938 May

DOC#: GY088

DOCUMENT DESCRIPTION: Proceedings of All Ohio Safety Congress

PROCEEDINGS
of
All Ohio Safety Congress

Held under the auspices of
THE INDUSTRIAL COMMISSION OF OHIO
and the direct management of
THE DIVISION OF SAFETY AND HYGIENE

Published under the authority
of
The Industrial Commission of Ohio

Deshler-Wallick Hotel

Columbus, Ohio

May 10, 11, 12

1938

THE F. J. HEER PRINTING CO.
Columbus, Ohio

THE OHIO LEGAL BLANK CO., INC.

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INHALATION OF DUST AND CONTROL OF DUST HAZARDS

MR. WILLIAM C. JAMES,

Safety Engineer, Portland Cement Association, Chicago, Ill.

Mr. Chairman, gentlemen:

Confusion still seems to be the dominant keynote outside the research laboratory in this question of occupational "dusty-lung" diseases. Terms such as pneumoconiosis, silicosis, siderosis, chalcosis and even silicosis are bandied about indiscriminately and often without meaning. Usually, the mere mention of dust in a conversation inspires visions of high mortality, high sickness rates and a long trail of serious hazards.

The term "pneumoconiosis" is often interpreted to mean a disease of the lungs resulting from dust inhalation. Actually, it means simply "dusty lung." In the early history of lung disease it was thought that all dusts caused the same disease reaction and this term was applied to that disease. Modern research has demonstrated that most dusts are harmless. The term "pneumoconiosis" therefore should assume its primary meaning and when applied to an individual can rightly be interpreted only as indicating that the person has inhaled dust. Dr. Leray U. Gardner, referring to non-specific pneumoconiosis says, "Such changes have no clinical significance and produce neither symptoms nor interference with working capacity. They are of no more importance than the calluses on the palms of the hands." Any person in any environment may develop this condition. Even office workers in large industrial communities may show X-ray evidence of having inhaled dust, but such evidence is meaningless as far as health is concerned.

Of the various seriously industrial dusts, coal and iron ore are perhaps most spectacular in their appearance in the lung. Early investigators, and by this I mean investigators in the first 18 or 17 centuries of the Christian era, were so impressed by the lung pigmentation of workers in iron ore and coal that they credited these substances with a prominent part in the development of lung disease. Modern research has demonstrated that this coloring of the lung tissue is, in itself, of no significance.

Only two substances are now known to cause a definite lung disease, namely, asbestos and uncombined silica. Research men who have dealt specifically with dust diseases have long recognized that dusts with a low silica content are free from health hazards. Compensation insurance actuaries are also accepting the fact, as is demonstrated by the rates they have set for the cement industry. Cement quarries contain mostly limestone, in which quartz constitutes less than 10% of the total rock formation. In California, cement plants and quarries have been entirely excluded from the occupational disease rate schedule. Indiana and Illinois both have all-inclusive occupational disease laws. In these states, a rate of only five cents has been set for both cement mills and quarry operations. That this rate is based on a known absence of hazard is evident when it is considered that quarries other than cement quarries have been assigned a rate of \$1.14 in Indiana and \$1.20, which is 24 times the cement rate in Illinois.

In Michigan, which has a schedule type law, the cement industry's rate is four cents. Other quarries have been assessed at the rate of forty cents in this state. New York State, which has a liberal combined schedule, and all-inclusive law, has set a rate of seven cents for the cement quarries. Quarries other than cement have been given a rate of \$1.97.

Inhalation of free silicon dioxide (usually quartz) in excessive quantities over a long period of time causes the disease, silicosis. You will note particularly that three factors are necessary to the causation of this disease:

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