

FILE NAME: National Safety Council (NSC)

DATE: 1933 Aug

DOC#: NSC449

DOCUMENT DESCRIPTION: NSC National Safety News - The Mechanical Control of Occupational Diseases with Underlines

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EXHIBIT

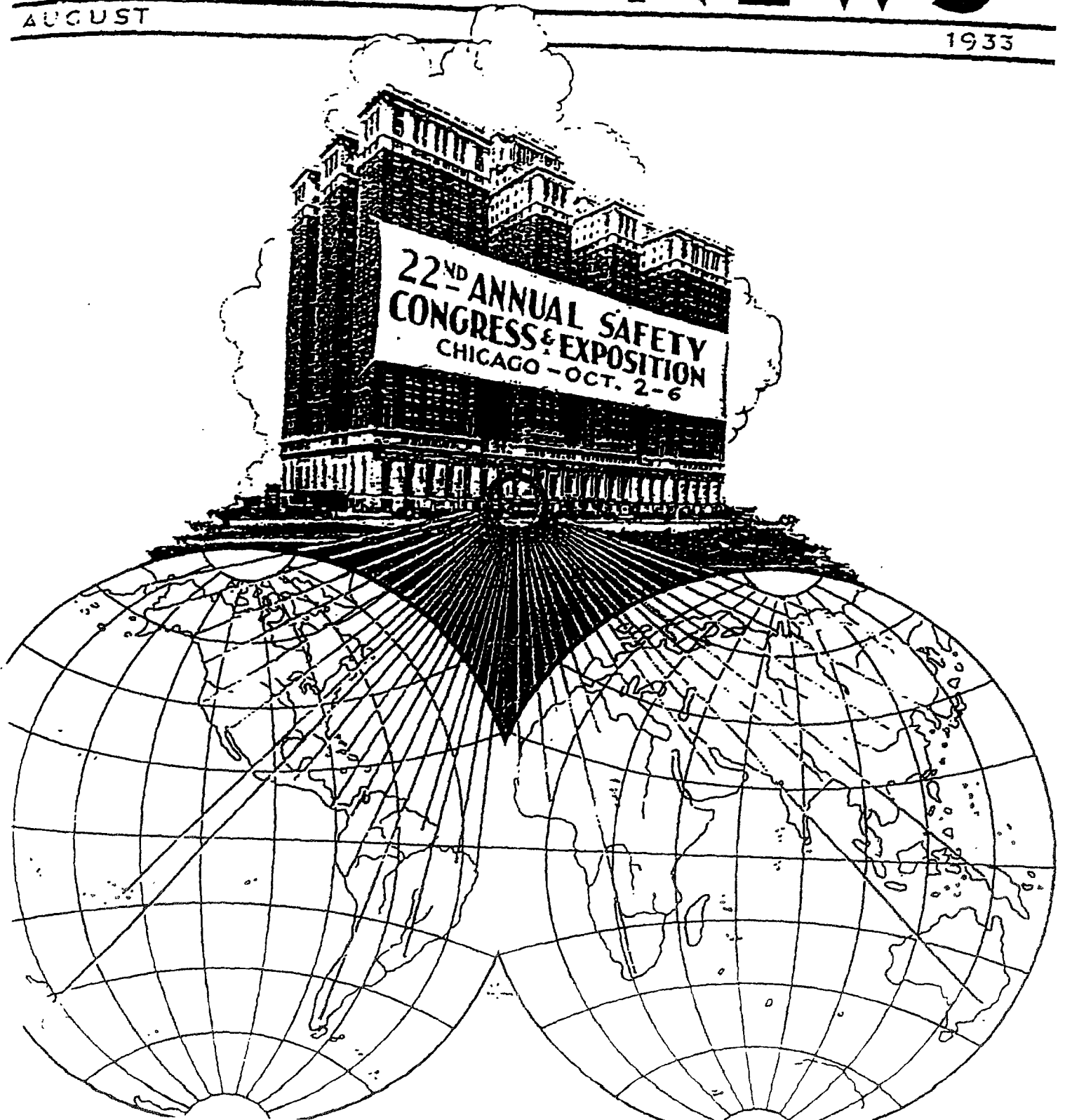
6-400

NATIONAL SAFETY NEWS

AUGUST

1933

22ND ANNUAL SAFETY
CONGRESS & EXPOSITION
CHICAGO - OCT. 2-6



National Safety News

Published monthly in the interest of accident prevention and the health of industrial workers

VOL. XXVIII, No. 2

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Copyright 1933 by National Safety Council, Inc. Printed in U.S.A. Published monthly. Entered as second-class matter June 1, 1921, at the Post Office at Chicago, Ill., under the act of March 3, 1879. Additional entry at St. Joseph, Mo.

The subscription price to members for extra copies of the NATIONAL SAFETY NEWS is \$4.00 per year. Single copies, 40 cents. Reduced quantity prices for yearly subscriptions and single copies on request.

Subscriptions are available only to members of the National Safety Council.

Member Audit Bureau of Circulation.

This magazine is indexed in the Industrial Arts Index.

Statements and opinions advanced in signed articles are to be understood as individual expressions of their authors, not those of the National Safety Council.

National Safety Council, Inc.

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The Mechanical Control of Occupational Diseases

By DAVID S. BEYER*

THE mechanical control of industrial disease cannot be covered adequately in a single article; all we can hope to do is to touch upon a few of the important points encountered by the plant managers who are struggling with the problem today.

There are some forty different diseases included in the compensation acts of various American states; in Massachusetts, Connecticut and several other states there is no definite list of diseases that are compensated, but these diseases are considered as "personal injuries" under the law and compensation is paid without any specific schedule of diseases.

Many of these diseases are of infrequent occurrence. Probably most of us outside the medical profession have never even heard of "Gonioma Kamassi" (African boxwood) or "miner's nystagmus," which appear on some of the state lists. A half dozen of the more important diseases, however, will probably cover ninety percent of the total payments being made throughout industry for all industrial diseases today.

An analysis of approximately \$300,000 in losses of one insurance company doing a general workmen's compensation and liability business, for recent industrial disease claims, showed 54 per cent for cases involving pneumoconiosis (including silicosis, asbestosis, etc.) 26 per cent for lead poisoning, 9 per cent for various forms of dermatitis, 5 per cent for benzol, and the remaining 6 per cent for scattering causes such as carbon monoxide, carbon tetrachloride, chrome and chlorine.

We will accordingly look at the subject from the standpoint of these few important causes, bearing in mind that the most important of all is covered by the general heading of pneumoconiosis, or diseases caused by dust. Of these diseases the most serious come from inhaling the silica found in sand, granite dust, abrasive powders, etc.

Both the engineer and the physician are needed in protecting the health of the worker and the pocket book of the employer. In this article Mr. Beyer presents the engineering side of the problem. In the June issue Dr. W. Irving Clark discussed it from the point of view of the physician.

When the subject of dust is mentioned most of us probably think of visible particles. In fact, much of the dust removal work, even by companies specializing along this line in the past, has been directed at this form of dust.

Medical research has shown us, however, that the dust that is most dangerous, through its deep inhalation into the lungs, is so small that the individual particles are invisible and can only be seen by the naked eye if they are gathered in a dense cloud, which may have the appearance of a gray fog.

We are told that the amount of dust found in the lungs of miners who have died of silicosis is about 13 grams, or approximately half an ounce - about enough to fill a ten-cent soda-mint bottle.

Microscopic Menaces

Some idea of the problem of collecting such infinitesimal particles may be had when we further learn that these 13 grams contain some 20 million million particles; many of them are about the size of the tiny globules of tarry substance that make up cigaret smoke, that is, about a hundred thousandth of an inch in diameter. If they were equipped with legs they could march fifty abreast through the hollow center of a human hair!

So little has the seriousness of this hazard been appreciated in the past that it is not uncommon to go into a plant and find four or five tons of this fine dust which has floated in the air and settled on the roof trusses and overhead structures of the building. Here it may be dislodged by gusts of air or vibrations from moving cranes, etc. If one

stops to figure how many 13-gram bottles are contained in a ton of this dust, its potentialities are appalling. The first need is to get rid of these unnecessary accumulations, and then try to prevent their recurrence.

Many a plant manager will say, "Why go to all the trouble and expense necessary to catch this dust when, in most cases, it isn't worth anything after it is caught?" The answer is that it is better to spend the money and effort in getting rid of the dust than to be overwhelmed by occupational disease claims, as is the case with many industrial concerns today.

In one section where there is a so-called "dusty" trade employing only about 2000 men on an annual basis, there have been 92 occupational disease claims during the latest available five-year period (68 of them for death or permanent total disability) with combined losses of nearly \$300,000.

In some industries the cost of industrial disease is now four or five times that of all other industrial accidents combined. Many concerns that have serious occupational disease hazards extending over a period of years find themselves virtually uninsurable, because of the heavy liability for claims that has been built up as the result of past exposure.

A Matter of Self-Preservation

It follows, therefore, that as a matter of self-preservation plants in these industries must start immediately a comprehensive program of improvement that will at least check the development of new cases.

In general, the most reliable way to

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See Dust Removers, p. 10, June, 1934.