

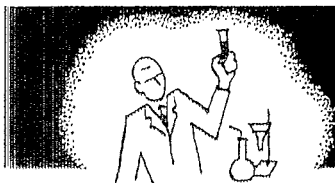
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INDUSTRIAL HEALTH



Abstracts of current literature
on Industrial Hygiene, Medicine, and Nursing

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Temporary Deafness

Temporary Changes in Acuity of the Human Ear Following Exposure to Intense Noise, by John B. Gallagher and John E. Goodwin. The AMA Archives of Industrial Hygiene and Occupational Medicine 6:332-338 (October 1952).

THERE HAS BEEN a number of investigations of the effects of exposure of the human ear to intense noise for comparatively short periods and the investigators are generally agreed that it produces a temporary hearing loss which may be moderate to marked but with a gradual complete recovery to normal acuity. It is also generally agreed that the loss in acuity is in the higher frequencies, particularly in the region of 4,000 to 6,000 cycles per second.

Two of the investigators have suggested that there is a relationship between the temporary deafness which can be produced experimentally and the permanent deafness which may result from long-time exposure to noise of high intensity. These have been only suggestions and such relationship has not yet been definitely established.

In this investigation a number of individuals were exposed for short times to approximately 115 decibels of a noise with approximately even intensity from 25 to 7,500 cycles per second.

The experimental subjects presumably had normal hearing. They were tested with a pure tone audiometer before the experiment started and used in the experiment only if they had no threshold more than 15 decibels below normal at any frequency or more than 10 decibels below normal at more

than one frequency. A total of 47 individuals ranging from 18 to 30 years of age were subjected to the intense noises in one or both ears. There was a small group each of whom had one normal ear and one ear showing early or minor abnormality and which consequently could be tested in only one ear.

After an exposure of 10 minutes to the noise, the hearing acuity of each individual was tested at 2,048; 4,096 and 8,192 cycles per second as rapidly as possible. The pre-exposure level of acuity was always attained for the lowest frequency within 30 minutes after exposure and within the same 30 minutes the acuity was practically up to normal at the two higher frequencies. Loss of hearing from the noise exposure was greatest at 4,096 cycles per second in most instances but in some was more severe at 8,192 cycles per second. The losses were generally reproducible within about 5 decibels on any given individual.

The hearing losses at 4,096 cycles per second were such that the test group could be readily divided into three distinct subgroups. The largest of the three groups was those whose ears showed relatively low susceptibility to noise and who, in this series of experiments, did not show any greater initial hearing loss than 17 decibels.

The second group were those whose ears were highly susceptible to noise at this frequency and who showed hearing losses of 22 to 40 decibels with a mean of 32½ decibels. The third group, with the pre-existing slight hearing loss in one ear, showed the same results in the other ear as did the more susceptible group of those with normal acuity in both ears.

This group of experimental subjects is small for drawing any very general conclusions, but it is of interest that all of the individuals who showed a minor loss in one ear had previously been exposed to excessive noise. Those with the more susceptible but normal ears had never been exposed to high noise levels before the experiments. The results are sufficiently suggestive to justify the further investigation of the possibility that measurement of the temporary loss produced by a short exposure to high frequency noise may give an index to the permanent loss which will be produced by chronic exposure.

Pneumoconiosis

Pneumoconiosis Due to Diatomaceous Earth, Clinical and X-Ray Aspects, by Reginald H. Smart and Walter M. Anderson. Industrial Medicine and Surgery, 21:509-518 (November, 1952).

Disabling human pneumoconiosis due to work in diatomaceous earth or kieselguhr was reported by Legge and Rosencrantz in 1932. Among 118 workers examined in a California diatomaceous earth plant they found 68.5 per cent with pneumoconiosis due

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Industrial Health

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to silica. Five of these cases were advanced sufficiently that they recommended a change of job and one individual was recommended for hospital care.

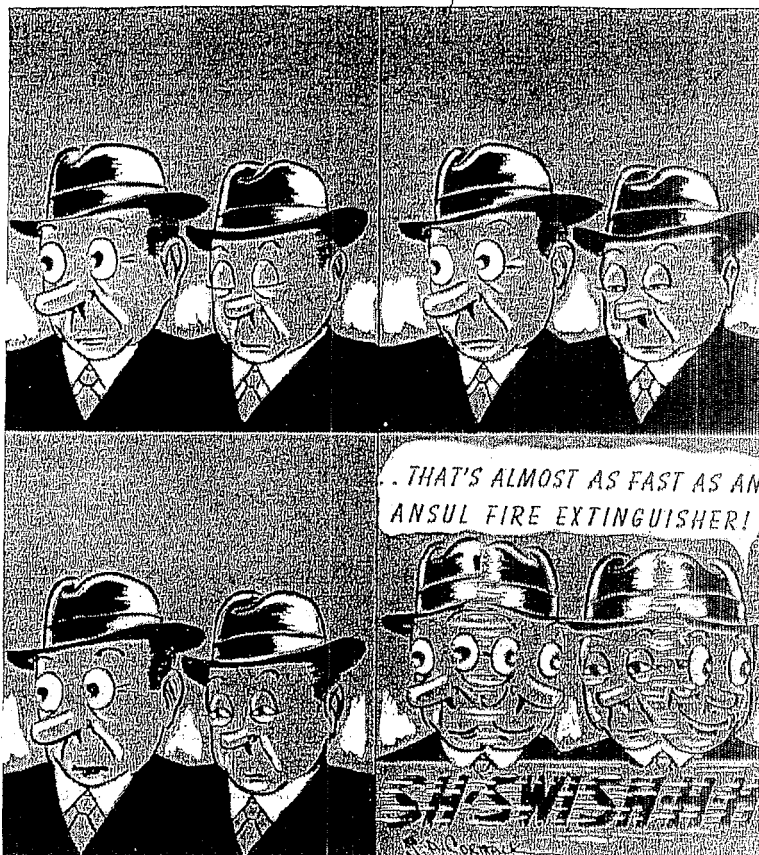
Reports of pneumoconiosis in European workmen have described typical nodular silicosis in some instances, but this diatomaceous earth is heavily contaminated with silica which probably accounts for this nodular lesion. In one Italian report the individuals who developed pneumoconiosis were engaged in the manufacture of silica filter candles in the course of which manufacture the diatomaceous earth was heated until it was changed to cristobalite and tridymite, both of which are considerably more toxic to tissue than is ordinary crystalline silica.

In the diatomaceous earth industry on the West Coast where these studies were carried on, the diatomaceous earth is relatively free from admixture with crystalline silica. Also, the crude material is not in a state to produce very large amounts of dust so that pneumoconiosis cases are not very common in the quarries or mines.

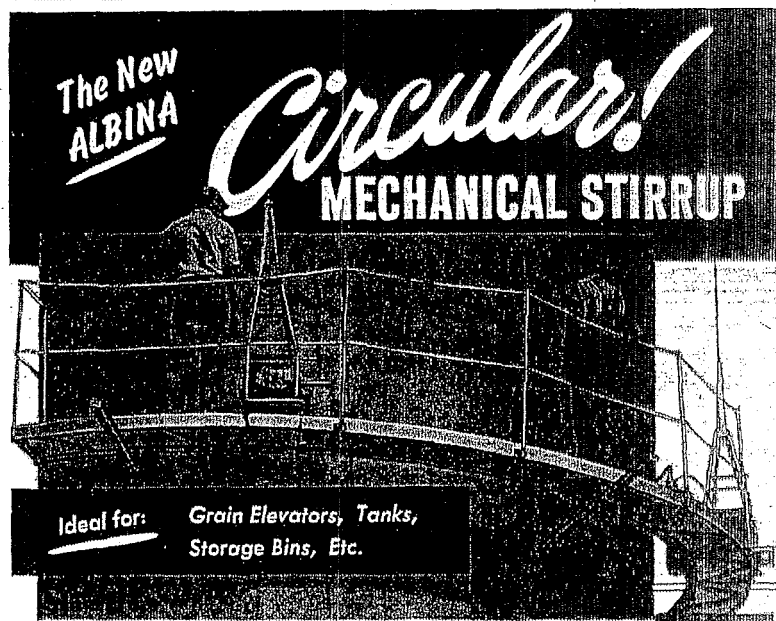
In the plants, the crude powder is dried, ground and air classified and some grades are calcined or flux-calcined and again milled and air classified before packing. This drying and milling of the material leads to the production of considerably more dust than is seen in the quarries.

These authors have clinically examined the employees of six Pacific Coast plants and have also carried on some animal experimentation and obtained autopsies on 23 workers employed in industry, of whom four died of diatomaceous earth pneumoconiosis.

The reaction of the lungs to diatomaceous earth is quite different from the reaction to crystalline silica in that these cases have all shown diffuse thickening of the lung tissue, particularly in the area around the blood vessels. These thickened areas tend to coalesce and break down and then



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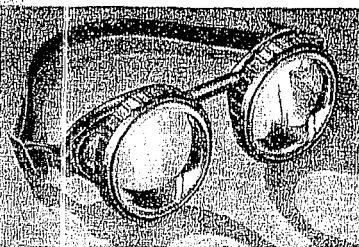
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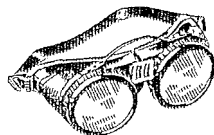
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to form scar tissue. There is also enlargement and formation of scar tissue in the lymph nodes in the lungs.

On the X-rays these conditions show as exaggeration of the linear marks in the lungs and generalized mottling of the lung fields which has been referred to as reticulation or "orange peel" appearance. In the more advanced disease the coalescent lesions appear as large opacities in the X-ray picture and are usually followed by contraction of the lung tissue and by development of cavities in the lung tissue.

The disease has been observed to progress for as long as three years after the exposure was terminated.

The appearance of the coalescent shadows in the X-ray pictures does not necessarily indicate infection with tuberculosis. Several of the individuals who have shown this effect gave no tests for tuberculosis in life and showed no sign of tuberculous infection at necropsy. The individuals with the

pneumoconiosis who did have tuberculosis seemed to show a relatively slow progress of the disease until cavitation occurred after which the patient's course was generally down hill in spite of any treatment.

The diatomite deposits are of two kinds. The diatomite which has been deposited from fresh water lakes appears to be considerably less toxic to human tissue than is the diatomite deposited from sea water.

Most of the individuals who showed pulmonary lesions have been in the industry for 15 to 25 years, although there are a few exceptional individuals who developed massive pneumoconiosis in two to three years.

Silicosis

Some Problems in Roentgen Diagnosis of Silicosis, by Eugene P. Pendergrass. The Journal of the American Medical Association, 150:1178-1179 (November 22, 1952).

The X-ray aspects of silicosis have been studied and the criteria for proper diagnosis are very well

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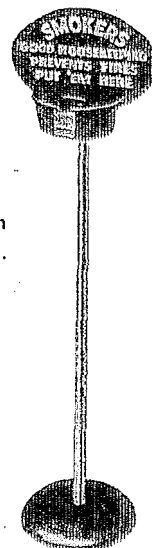
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known to a number of physicians. It is generally conceded in this country that the roentgen examination is the best method of demonstrating the pathological changes produced by silicosis. It is not customary to diagnose silicosis in the absence of positive X-ray evidence. At the same time there are certain difficulties of personal observation and certain difficulties of recognition of lesions in the X-ray. In spite of the general impression that lesions of two to three millimeters in diameter are regularly recorded on the X-ray, three instances are cited of various lesions one to five centimeters in diameter which have been missed on repeated X-ray examinations.

There is also the difficulty of misdiagnosis where there are single small massive silicotic lesions with other nodulations which do not show in the X-ray picture. These cases can be diagnosed as carcinoma of the lung and such cases have been

seen in which the silicotic nodule has been recovered at operation.

Pendergrass has also made the observation that large silicotic lesions will migrate toward the hilum area of the lungs on continued repeated observations. This will explain atypical distribution of some of these lesions.

Safety's Arctic Outpost —From page 19

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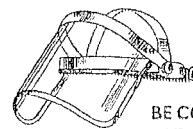
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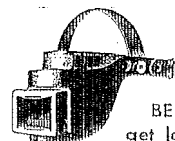


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