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NOTES for Physicians and Surgeons in Industry

Sulfur dioxide	5	2
Synthetic	1	—
Tartronic acid	1	—
Tetra ethyl lead	2	—
Thalium	—	—
Trichloroethylene	8	2
Typhoid phosph.	1	1
Trisulphide	4	5
Unknown	12	7
Veratrine	—	2
Vegetable	1	—
Water	8	—
Zinc chloride	3	—
Zinc sulfide	—	1
Total	610	906

Dusty Death

"THERE is a sinister spot that stalks every industry — a ghost whose name itself is forbidding. It is called pneumoconiosis," and it is quite as dangerous as it sounds, dangerous in more ways than one.*

Pneumoconiosis is the general term the term applied to describe all types of dusted lungs. Its literal translation is "a dusted lung". As a general or family appellation it embraces the diseases which may result from inhalation of any sort of microscopic particles, common or rare.

In industrial practice, of course, there are four principal sub-divisions of pneumoconiosis which occur with sufficient frequency to make them the subjects of this short general symposium. The first of these types, and perhaps the most commonly encountered is silicosis.

What is silicosis? It is a disease of the lungs in the progress of which there is a gradual replacement of the normal elastic by unyielding inelastic fibrous tissue. The cause is the irritating or coagulating breathing of microscopic particles of silica dust or sand for varying intervals of time. This causes an increase in the volume of fibrous tissue in the lungs which, in turn, is marked by shortness of breath and decrease in lung expansion with a resultant susceptibility to tuberculosis.

Asthma is caused, as the name implies, by the inhalation of microscopic particles of substance dust. This type of pneumoconiotic produces a definite and general fibrosis of the lungs. That is to say, a large volume of fibrous tissue is developed in the lungs as the result of the chronic inflammatory condition induced by the presence of asbestos dust. The problem of treatment becomes involved because, instead of normal tissue which is diseased, it is necessary to deal with tissue chronically inflamed by this unusual causation. Fibrosis of the lungs set up by asbestos dust inhalation is as serious to the point of disability as silicosis but, so far as our present clinical experience goes, not nearly so frequent in occurrence.

Coniosis is a vague term which I have been unable to discover in the literature of pneumoconiosis though it has considerable current lay usage. I am of the opinion that it originated in the minds of imaginative lawyers to enable them to bring action against a great industrial organization (Case 1). The physician employed by the attorney, gave, as his diagnosis, a sentence to the effect that the man's condition

was due to inhalation of cement dust during a period of seven years.

Asbestosis, as seen from its position, is the designation which classifies pneumoconiosis contracted from breathing coal dust or microscopic particles of carbon. These particles are present, of course, in the atmosphere of any populous center where coal consumption is heavy. Men who work in or about mines and coal yards are the typical victims of its attack.

In general, however, it is preferable to use the generic term pneumoconiosis to label any form of dusted lungs. Perhaps it is well to emphasize the fact that silicosis can be contracted only by breathing microscopic particles of sand or silica dust. Clinically and medicinally, silicosis has no distinct cause or effect relationships with the other forms of pneumoconiosis.

Silicosis makes its appearance among workers in industries whose atmosphere contains microscopic particles of silica. The word microscopia must be repeated frequently in this text because it most aptly defines these extremely minute insoluble bits. It is common practice to consider as harmful only those particles which have diameters smaller than 10 microns. Since a micron is equal to 1/25,000 of an inch, it will be seen they are so small that they must be counted or studied under the microscope.

A great deal of interesting and effective work has been done in industry to protect these employees who devote their entire time to manipulating tools on grinding stones. It was thought, at one time, that water poured continuously over the stones would eliminate the free silica particles which result from such operations. Tests have proved on the contrary, that the application of water actually helped out the hazard because the particles in suspension in the liquid are thrown to distances greater than those attained by the ordinary resultant dust.

Probably the sand-blaster is the worker who undergoes the greatest risk in following his occupation. We have known for a long time that men so engaged must have protection against flying dust and scale. More recently we have realized that the microscopic particles set free by sand-blasting activities are really more dangerous and sell for more inflated prices than the visible.

The dust occasioned by grinding and sand-blasting operations may be divided into two general classes, soluble and insoluble. It is needless to elaborate the divisions excepting to say that soluble dusts are relatively innocuous. Insoluble dusts, unfortunately, are always present and are very dangerous because they usually occur in highly concentrated proportions—a fact previously mentioned, quite as evident when wet process grinding wheels are employed.

It may be interesting to industrialists to know what actually happens to inspired dust. Remember, now, that we are concerned with these microscopic particles discovered only under the microscope. This dust is inhaled through the nostrils and mouth into the bronchi and from there into the air cells and the mediastinal glands.

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* N. Robinson, Dorr, in *General Hygiene*, 1915.

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