# *Some Thoughts on Silicosis*

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Silicosis, perhaps more than any other condition, has demonstrated the inexactitude of diagnostic standards for occupational disease. For example, the work of Gardner and other investigators has shown that, far from being fatal, the uncomplicated form is nondisabling except in extreme degrees of fibrosis. There has been so much intensive study of silicosis that it might appear that little remains to be done. Complacency amounting to boredom has crept into the picture, and on occasion speakers discussing the subject have been introduced with a note of apology for bringing up such a shopworn, dusty topic. A few individuals imbued with unjustified optimism have even predicted that since we have learned everything about silicosis, the application of modern methods of control will soon make the disease another vanishing entity.

Unfortunately, the experience of the last few years does not substantiate this rosy outlook. Tremendous advances have been made in controlling the hazard but knowledge of these often seems to be lacking, especially in those quarters where it is most urgently needed. Physicians, industrial and otherwise, still make a diagnosis of occupational fibrosis because of the chest X-ray pattern and/or a history of employment in a supposedly dusty industry. No consideration is given to the fact that dependable estimations of respirable sized particles of dangerous dust and safe atmospheric concentrations have been established. The plant physician is frequently unaware that such standards exist and management has been lax in bringing the matter to his attention. Industrial compensation commissions need to be reminded that consideration of these factors is essential before awards for disability, based on vague roentgenographic shadows and uncertain exposures, should be granted or upheld.

As more unrelated conditions whose X-ray appearances closely simulate silicosis are recognized, the unreliability of the roentgenogram alone as a diagnostic measure becomes obvious and accurate interpretation is correspondingly difficult.

A situation of this kind points out the necessity of accumulating factual data on exposure through industrial hygiene surveys. Such appraisals must include enough samples to be truly representative. They should faithfully portray actual working conditions and environmental hazards. One should not be concerned so much with the amount of visible dust in the atmosphere of a working place as with the number of harmful particles that actually reach the alveoli of the lungs and are retained. We have seen reports of plant surveys where obviously the hygienist has been too impressed with visible dust around a shake-out where careful analysis revealed mostly smoke, steam, and carbon particles with free silica well below accepted safe limits. This same individual missed a really serious dust hazard where free silica was present in high concentrations but was not evident because the general atmosphere appeared to be clean.

In recent years considerable attention has been given to nodular patterns observed in the X-rays of workers exposed to significant concentrations of iron dust. Reports from this country and abroad have shown that such exposures are capable of producing shadows almost identical with those of silicosis, even in occupations where tests indicate a practically complete absence of free silica in the atmosphere. Postmortem findings on some of these individuals have demonstrated only simple deposits of iron particles in the lungs with no evidence of fibrosis.

We have noted similar X-ray changes in certain grinders and burners in the foundry industry. The shadows have appeared in comparatively short periods of time, the average being about 6 years. Analysis of the air-borne dust in these locations by counts, X-ray diffraction, and estimations of particle size and per-

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## CHEST CONDITIONS WHOSE X-RAYS SIMULATE SILICOSIS

### A. Industrial

| | | |
|---|---|---|
| I. Organic | | (a) Byssinosis. |
| | | (b) Bagassosis. |
| | | (c) Tabacosis. |
| II. Inorganic | | (a) Anthracosis. |
| | | (b) Radiopaque Deposits— |
| | Inert | Barium (Baritosis). |
| | | Iron (Siderosis). |
| | | Tin. |
| | Toxic | (c) Beryllium. |
| | Proliferative | (d) Asbestosis. |

### B. Nonindustrial

| | | |
|---|---|---|
| I. Mycotic | | (a) Aspergillosis. |
| | | (b) Moniliasis. |
| | | (c) Wood dust spores. |
| | Yeasts and Molds | (d) Coccidioidomycosis. |
| | | (e) Blastomycosis. |
| | | (f) Actinomycosis. |
| II. Miscellaneous | | (a) Miliary tuberculosis. |
| | | (b) Sarcoidosis. |
| | | (c) Mitral Stenosis. |
| | | (d) Cancer (Metastases). |
| | | (e) Vascular changes. |
| | | (f) Miliary calcicosis (Wheatena). |
| | | (g) Polycythaemia Vera. |
| | | (h) Bronchiolitis. |