

Chest Conditions Simulating Silicosis

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IN RECENT years the recognition of true occupational fibrosis has become more difficult because of an ever increasing number of conditions which produce patterns in the roentgenogram resembling silicosis. These are by no means confined to diseases caused by the inhalation of dust but range all the way from certain heart affections to the exaggerated linear markings representing vascular changes in the lungs associated with advancing age. Their careful appraisal as a health consideration as well as an industrial complication therefore becomes more essential as new complexities appear.

The following classification of diseases whose x-ray pattern may be confused with that of silicosis is offered not as a complete listing but as one which includes those derived from a search of the available literature. Mycotic infections have been placed in the non-industrial group because the majority of them occur without any relationship to specific occupations. However, they do result, in some instances, from occupational exposure.

Chest Conditions Whose X-rays Simulate Silicosis	
A. Industrial	
I. Organic	(a) Byssinosis (b) Bagassosis (c) Tabacosis
II. Inorganic	(a) Anthracosis (b) Radiopaque Deposits— Barium (Baritosis) Iron (Siderosis) Tin (Inert) (Toxic) (Proliferative)
B. Non-Industrial	(c) Beryllium (d) Asbestosis
I. Mycotic	(a) Aspergillosis (b) Moniliasis (c) Wood dust spores (d) Coccidioidomycosis (e) Blastomycosis (f) Actinomycosis (g) Yeasts and Molds
II. Miscellaneous	(a) Miliary tuberculosis (b) Sarcoidosis (c) Mitral Stenosis (d) Cancer (Metastases) (e) Vascular changes (f) Miliary calcinosis (Wheatena) (g) Polycythemia Vera

Since the year 1818 certain pulmonary conditions are believed to have developed as a result of exposure to dust in the cotton industry. Reports from Europe as well as from this country indicate that prolonged exposure to high concentrations of cotton dust have caused definite symptoms and permanent disability. In England the Byssinosis Act of 1940 awards compensation for total disability following periods of exposure in cotton mills up to 20 years. In the United States the existence of byssinosis as an occupational disease

is questionable. A few cases have been reported from Eastern textile mills but after a very thorough investigation of the cotton industry in Mississippi in 1944, Ritter and Nussbaum were unable to demonstrate any x-ray findings characteristic of the disease, either in employees in the cotton mills or in the files of private roentgenologists or the State Tuberculosis Sanatorium. They did find certain allergic individuals who showed very definite asthmatic reaction to high concentrations of cotton dust, but otherwise clinical evidence was lacking. Postmortem and histological examinations revealed nothing of a specific nature. They concluded that "no evidence was found to clarify or even support the existence of byssinosis as a clinical entity arising among employees exposed to Upland cotton in a cross section of that industry in Mississippi."

Bagassosis is the name given to an industrial disease observed in a few workers in the sugar-cane industry. The disease is described by Castleden and Hamilton-Patterson and also Gillison and Taylor in the *British Medical Journal* in 1942. They state that "bagasse," a waste product after the sugar has been extracted, is used in the manufacture of board. The material is crushed or shredded into small fragments, the fibres of which contain about 1% protein and 5 to 7% silica. Symptoms after one to two months' exposure, consisted of dyspnoea, cyanosis, violent cough, scanty sputum, occasionally blood streaked, and mild elevation of temperature. The x-ray suggested a bilateral pneumonia of the influenzal type which either resolved completely after several weeks or left the patient with some degree of residual fibrosis. As in the case of byssinosis an allergic response in the lungs to this dust was a definite possibility.

Tabacosis has been described as far back as 1865 as producing disease in the lungs. However, very few cases seem to have been reported. In Argentina and Brazil the condition is considered an occupational disease and is compensable. C. F. Long, after a period of 10 years experience among 4,000 workers in the tobacco industry, made a special investigation of over 1,247 who had been subjected to tobacco dust and compared them to 1,007 who had never been exposed. He concluded that "Tabacosis does not develop in the lungs of those who inhale tobacco dust."

Some inorganic dusts produce alterations in the lungs which are represented by a mild accentuation of the linear markings in the x-ray. Included in this group are dusts from such materials as limestone, marble, talc, chalk, calcined magnesium for insulation, furnace linings, carbon and cement. Since they are relatively inert and non-productive of symptoms, their presence is only detectable by x-ray and the shadows observed may resemble the exaggerated lineal pattern of pre-silicotic stages.

Dusts from substances like barium, iron and tin, can result in radiopaque deposits in the perivascular lymphatics and interalveolar septa which cast shadows in the roentgenogram closely simulating those of discrete, nodular silicosis. The deposits have real sig-