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PULMONARY ASBESTOSIS IN ITS CLINICAL ASPECTS*

SIR THOMAS OLIVER, M.D.

Newcastle-upon-Tyne, England

A SHORT account of the history of asbestos, and also of the processes of its manufacture into cloth-like structures much in the same manner as raw cotton fiber is woven, has been written by Dr. W. E. Cooke. He has told us that in the carding department a considerable quantity of dust is evolved. The crushing of the rock is not carried on to any extent in Great Britain. This is usually done in the countries where the mineral is quarried. Canadian rock is crushed in Canada, so as to reduce the expense of transport to Great Britain. British workers are therefore less exposed to the harmful influence of the dust, a fortunate circumstance since the rock frequently contains (according to chemical analysis) as much as from 50 to 60 per cent. or more of silica in the form of silicate of magnesia.

With the exception of Dr. Cooke's paper on pulmonary asbestosis, published in 1924, and the details of a fatal case published by Dr. Montague Murray in the *Charing Cross Hospital Gazette* in 1900, there has not been anything written, to my knowledge, in Great Britain upon the subject. I have had, however, the opportunity of visiting asbestos factories in

America and of seeing cases of pulmonary asbestosis through the kindness of Dr. Haddow and Dr. Grieve of Armley, Leeds. It may, I think, be shrewdly suspected that there have been several deaths of workers in British factories from the malady, but as no autopsy or microscopic examinations of the lungs have been made, such deaths would probably be certified as pulmonary tuberculosis.

Since these lines were written, I have in August last visited the asbestos mines in Thetford, Canada. The material is obtained by blasting in the open quarry the hard rock, when, adherent to portions of it, may be seen the silken fibers of the mineral. The broken rock is subsequently crushed, recrushed, screened, and pulverized to sand. The finely crushed product is thereafter passed over vibrating machinery when the liberated asbestos fibers are aspirated by vacuum fans into chambers and retained. The sand is useless and goes to form the huge white dumps which are disfiguring objects of the landscape in an asbestos mining district. The finer crushing and screening are dusty processes.

Asbestos manufacture is largely a familial occupation. It has been carried on in England only for a little over thirty years. Carding and spinning of the fiber are important processes in the manufacture of asbestos

* Read in the Section of Preventive Medicine, British Medical Association Meeting, Edinburgh, July 21, 1927. Received for publication July 26, 1927.

goods. In these departments many women are employed, mothers being succeeded by their daughters. Where ventilation of the carding and spinning rooms is properly attended to, the atmosphere is fairly clear of dust and floating fiber; otherwise in these operations considerable quantities of dust become suspended in the atmosphere. In a British factory the dustiest process is "hand beating" of the finished mattresses which are used for covering and protecting the internal machinery of automobiles. This work should only be undertaken in a room separated from the main parts of the factory, with open windows at one end and strong down drafts at the other; but even with this precaution men working therein should wear masks.

Recently, along with Dr. Grieve of Armley, I examined two women, subjects of pulmonary asbestosis—one is aged 48 and the other 39. The older patient was one of the first to commence work thirty years ago in the particular factory that I visited. At that date no danger from dust was anticipated, so that no effective ventilation of the workrooms was attempted, such as prevails today. Although only 48 years of age, the first patient mentioned looks older by several years and is extremely emaciated. She gave up work a year ago on account of increasing physical debility, shortness of breath, and cough. At present she has no expectoration; her respiratory capacity is 1 inch. Although the apices of both lungs in front are resonant, there is distinct flattening of the percussion note at the bases. The respiratory murmur at the apices and

mid-lung is coarser than usual, and the expiratory murmur is prolonged. At the right base the respiratory murmur is feeble, and small dry friction sound is heard. Toward the base of the left lung and extending into the axilla are heard small, moist tinkling sounds, suggestive of cavitation having taken place. Here also small friction sounds are heard. Similar physical signs prevail posteriorly. The apex beat of the heart is displaced upward and outward; it is felt external to the nipple, a circumstance which along with marked accentuation of the second sound of the heart heard over the pulmonary artery suggests that fibrotic changes have already taken place in this lung. Although the patient states that she has no expectoration, this was present six weeks ago and when examined it was found to be free of tubercle bacilli. There is no enlargement of the external glands.

The other patient, aged 39, has been an asbestos worker for eighteen years. She had no illness until four years ago, when she developed cough and attacks resembling bronchial asthma. After remaining away from the factory for three months she returned to her employment and followed the occupation for three years, when she married. As in the early months of her pregnancy she lost considerably in weight, she retired from the factory. Although she was reduced considerably in weight, and the subject of cough all through the pregnancy, her infant daughter who is 14 months old is healthy and well developed.

The patient complains of a dragging in the chest without actual pain. There is noticeable shortness of breath

on slight exertion and she complains of morning cough with expectoration. The sputum has been examined and is negative for tubercle bacilli. Her appetite is poor. She weighs 8 stones, a drop of 3 stones having occurred within the last two years. Her heart is healthy; the apex beat is not displaced, but the second sound over the pulmonary artery is distinctly accentuated. The apices of the lungs are resonant. Here the respiratory murmur is coarser than usual and the expiratory is prolonged so that the inspiratory and expiratory murmurs approach each other in equality. Moist râles are heard in midaxillae and small friction with crepitation is heard at the bases. This patient's mother, aged 60, is still working in the factory.

From what I have seen clinically of pulmonary asbestosis it resembles

silicosis of the lungs in pronounced shortness of breath on slight exertion, in deficient respiratory capacity, in physical debility and, on examination of the sputa of not too far advanced cases, in the absence of tubercle bacilli; but, since fibrotic changes are taking place in the lungs of both patients, the possibility has to be envisaged of the development, if such has not already taken place, of pulmonary tuberculosis.

The clinical picture of pulmonary asbestosis differs slightly from that presented by a patient who is the subject of ordinary tuberculosis of the lungs in so far as there is a noticeable darkening of the skin varying from mild bronzing to slight blueness, a degree of shortness of breath in excess of the physical signs, a greater amount of general disability, little expectoration, and comparative absence of night sweats.

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