INDUSTRIAL HYGIENE

F. G. PEDLEY, B.A., M.B., D.P.H.; J. G. CUNNINGHAM, B.A., M.B., D.P.H.

ASBESTOSIS

FRANK G. PEDLEY, M.D., D.P.H.

WITHIN the past five or six years industrial hygienists have become interested in the effects of asbestos on the health of workers. In the Province of Quebec a very considerable part of the world's supply of asbestos is mined, and the industry has been in existence for forty years or more. To our knowledge, however, no case of pneumoconiosis has been reported from asbestos in Canada, and the general impression among miners is that the dust is not hazardous. It is from England that the first cases of pulmonary asbestosis have been reported. Dr. W. E. Cooke, in 1924, published the history of a case of pulmonary fibrosis in an asbestos worker. Since then a small literature has developed, which promises to grow very much larger as time goes on.

The cases of asbestosis so far reported—with the exception of four Rhodesian miners—have occurred in the manufacture of asbestos; but it is quite possible that the condition in mines may have gone unrecognized, for mines are usually situated in the country, whereas factories are apt to be in the city where facilities for autopsies are better. If, however, miners were seriously affected by asbestos the effects should be reflected in a high tuberculosis death rate, provided the mining population was fairly stationary and did not go to sanatoria or elsewhere to die. It is believed that the population of Thetford Mines, P.Q., is quite stable. Since this town is given over entirely to the mining and milling of asbestos the following death rates per 100,000 from tuberculosis in Thetford Mines and the Province of Quebec during the years 1926, 1927 and 1928 will be of interest. (Quebec did not enter the registration area until 1926.)

	1926	1927	1928
Thetford Mines	176.5	124.5	112.7
Province of Quebec	128	121.8	121.1

In view of the fact that the population of Thetford Mines is only about 12,000 it is to be expected that the death rates would fluctuate considerably from year to year. These figures, therefore, do not indicate an undue mortality from tuberculosis in Thetford Mines.

Canadian asbestos occurs as a silky, fibrous form of serpentine in seams of varying width. Its analysis shows it to consist largely of magnesium silicate, but there is usually some iron present. Mining is carried on in open quarries, and is not usually a very dusty job, but in the milling a great deal of fine dust is created, and men who work there are heavily exposed to whatever hazard may exist. As mentioned above, however, it is the general impression, both among miners and physicians, that asbestos dust is not particularly harmful. There can be little doubt, however, that the disease, asbestosis, is a clinical entity,

and it has been recognized by the English authorities to the extent of its inclusion as a compensatable disease. (See: Jour. Amer. Med. Assn., June 28, 1930, p. 2078.)

Pathologically the lungs of an individual afflicted with asbestosis show a diffuse fibrosis, not unlike silicosis in the gross. Microscopically, however, the appearance is different. For one thing large particles of dust morphologically similar to asbestos dust can be found in the fibrotic areas. In silicosis the siliceous particles are very difficult to see and are very much smaller. In addition to the large particles of dust sections of the lung show yellowish, elongated bodies from 20 to 100 microns in length, usually dumb-bell shaped and often segmented. These are the "curious bodies" and have been described everywhere asbestosis has been reported. Their origin is not known, but it is thought that they are aggregations of protein material about a central spicule of asbestos.

Unquestionably these "curious bodies" have stimulated much interest in the disease, asbestosis. Pathologists, whose interest in such a disease might languish, become alive at the sight of the "curious bodies". From the public health standpoint, however, it seems hardly likely that asbestosis will become of importance either from the standpoint of morbidity or mortality.

The following is a fairly complete list of articles on the subject to date:

1. "Effects of Asbestos Dust on Workers' Health in Asbestos Mines and Factories".
   Labour Gazette, Feb., 1912, 761.
2. "Fibrosis of the Lungs due to the Inhalation of Asbestos Dust".
   W. E. Cooke, Brit. Med. Jour., July 26, 1924, p. 147.
3. "Pulmonary Asbestosis in its Clinical Aspects".
   Thos. Oliver, Jour. Ind. Hyg., 9, 483, Nov., 1927.
4. "Pulmonary Asbestosis".
   W. E. Cooke, Brit. Med. Jour., (Dec. 3, 1927), 1024.
5. "Histology of Pulmonary Asbestosis".
   W. E. Cooke, Brit. Med. Jour., (Dec. 3, 1927), 1025.
6. "Asbestosis".
   McDonald Stuart, Brit. Med. Jour., 1927, ii 1025.
7. "Pulmonary Asbestosis in South Africa".
   F. W. Simson, Brit. Med. Jour., May 26, 1928, pp. 855-857.
8. "Asbestosis".
   M. J. Stewart, Brit. Med. Jour., 1928, ii 509.
9. "Asbestosis".
   H. E. Seiler, Brit. Med. Jour., ii, 1928:982.
10. "The Presence of Asbestos Fibre in the Lesions of Asbestos Workers".
    S. R. Gloyne, Tubercle, June, 1929, p. 405.
11. "A Case of Pulmonary Asbestosis".
    W. B. Wood & D. S. Page, Tubercle, July, 1929, p. 457.
12. "Asbestos Dust and the 'Curious Bodies' Found in Pulmonary Asbestosis".
    W. E. Cooke, Brit. Med. Jour., Sept. 28, 1929, 578.
13. "Clinical Aspects of Pulmonary Asbestosis".
    A. C. Haddow, Brit. Med. Jour., Sept. 29, 1929, 580.
14. "Further Observations on Pulmonary Asbestosis with Special Reference to Asbestos Dust and the 'Curious Bodies' Found in the Lungs".
    W. E. Cooke, Jour. Royal Microscopic Soc., 1930, vol. 50, p. 15.
15. "Pulmonary Asbestosis. A Socio-medical Study".
    Archiv für Gewerpepathologie und Gewberhygiene, Sonderabdruck aus 1. Band und 2. Heft, 1930.
16. "Asbestos".
    Occupation & Health, International Labour Office, Brochure No. 27.
17. "The Occurrence of Pulmonary Fibrosis and other Pulmonary Affections in Asbestos Workers".
    E. R. A. Merewether, Journ. Indust. Hygiene, 12, 198-222 and 239-257, May and June, 1930.