

31 had been asbestos workers. Much more unexpected, however, was her discovery that nine had merely lived in the household of an asbestos worker, raising the serious question of a special hazard of family exposure. Then, of the 36 who neither worked with asbestos nor had relatives who worked with asbestos, eleven had lived within a half mile of an asbestos plant. The latter cases, of course, suggested a special risk associated with neighborhood contact with asbestos.

Similar findings were reported by Jan Lieben last year in Pennsylvania. Of 42 cases of mesothelioma reviewed by the Pennsylvania State Department of Health, twenty had identifiable occupational exposure. In addition, eight individuals had lived within the vicinity of an asbestos plant and three had had family contact.

We have confirmed that family contact is a distinct possibility. Sampling of both ambient air and settled dust in the homes of New York insulation workers has shown characteristic asbestos particles to be present, presumably brought home on the clothes of the workmen.

It is obvious that the spectrum of asbestos disease has considerably widened in the last several years. In addition to lung cancer and asbestosis, a number of other tumors are now recognized as constituting a hazard. Rather than a small number of heavily exposed workmen, a large number are involved in less intense direct occupational exposure or even in indirect occupational exposure. The latter may represent a real problem; there are, for example, 3,500,000 men employed in the construction and shipbuilding industries, or five percent of the total employed population in the United States. Significant exposure may even extend to the families of these men and perhaps to residents in the neighborhoods surrounding their places of employment. Finally, this ubiquitous material may well be found to permeate the community at large. What such exposures may bring is not now known. Disease associated with asbestos is rarely seen sooner than 20 to 30 years from the onset of exposure. Thus, among our insulation workers in New York, I have yet to see a mesothelioma in a man who began work after 1930 or a case of lung cancer in an asbestos worker who had worked in that industry less than twenty years. Our concern is with the future.

At the outset of this presentation, I questioned whether asbestos might properly be included as an anticipated environmental hazard. Yet the less iconoclastic among us might have countered with: it must have been—we could not have knowingly allowed this to come to pass! Surely the explanation lies in the length of the period that elapses between exposure and disease which kept us from really knowing the problem until now.

Perhaps so. Indeed, I do not share the demagogical theory of industrial hygiene history, in which industry is seen as callously exchanging human disease for profits. Rather, I would say industry shared the ignorance and lethargy of us all. The answer will come in these next several years. We have some reason for optimism. First, we have the law of averages on our side—sooner or later, some important environmental hazard is bound to be controlled. I suspect asbestos will be one. We have reason to believe that the dose-disease relationship is on our side—to the present, disease has been uncommon except with significant exposure. And our data suggest further that such significant exposure can be prevented, that we can learn to live and work with asbestos. All it will take is the doing—but herein lies another tale.

NOTES

p. 3. "... when Aurnbault described ..."

Aurnbault, M. "Observations regarding the Hygiene and Safety of Workers in Asbestos Spinning and Weaving Mills." *Bulletin de l'Inspection du Travail* p. 124, 1904.

"Cooke described another case ..."

Cooke, W. E. "Fibrosis of the Lungs Due to Inhalation of Asbestos Dust." *British Medical Journal* 2:147, 1934.

"... the careful studies of Richard Doll ..."

Doll, R. "Mortality from Lung Cancer in Asbestos Workers." *British Journal of Industrial Medicine* 11:31, 1954.

"... concluded by R. Oyster Hammond, J. Churg and myself ..."

Belkoff, I. J., J. Churg and R. C. Hammond. "Asbestos Exposure and Neoplasia." *Journal of the American Medical Association* 159:22-25, April 4, 1944; "Relation between Exposure to Asbestos and Mesothelioma." *New England Journal of Medicine* 271:440-41, 1945. Belkoff, I. J., R. A. Bader, M. E. Bader, J. Churg, and R. C. Hammond. (Editorial) "Asbestos and Neoplasia." *American Journal of Medicine* 42:487-495, 1947. Belkoff, I. J., R. C. Hammond and J. Churg. "Asbestos Exposure, Smoking and Neoplasia." *Journal of the American Medical Association* 204:104-112, April 1, 1948. Belkoff, I. J. and R. C. Hammond. "Community Effects of Non-occupational Environmental Asbestos Exposure." *American Journal of Public Health* 48:1644-1646, September, 1958.

"... since Mancuso's findings ..."

Mancuso, T. S. and E. V. Coulter. "Methodology in Industrial Health Studies. The Cohort Approach, with Special Reference to an Asbestos Company." *Archives of Environmental Health* 2:214, February, 1953.

"... the publication ... by Wagner and his colleagues ..."

Wagner, V. G., C. A. Elmore, and P. Marchand. "Diffuse Pleural Mesothelioma and Asbestos Exposure in the North Western Cape Province." *British Journal of Industrial Medicine* 17:264-271, 1960.

"... Kivimäki raised an analogous question."

Kivimäki, R. "Pleural Calcification as a Roentgenologic Sign of Non-occupational Endemic Anthracycline-asbestosis." *Acta Radiologica (Supplement)* 194:1-47, 1955.

"... Thomson reported ..."

Thomson, J. C. "Exposure to Asbestos Dust and Diffuse Pleural Mesothelioma." *British Medical Journal* 1:123, Jan. 12, 1941. Thomson, J. C. et al. "Asbestos as a Modern Urban Hazard." *South African Medical Journal* 21:77-81, Jan. 19, 1948.

"Muriel L. Newhouse investigated ..."

Newhouse, M. L. and H. Thompson. "Mesothelioma of Pleura and Peritoneum following Exposure to Asbestos in the London Area." *British Journal of Industrial Medicine* 22:241-250, Oct., 1965.

p. 7. "Similar findings were reported by Jan Lieben ..."

Lieben, Jan and H. Pustawa. "Mesothelioma and Asbestos Exposure." *Archives of Environmental Health* 14:510, April, 1947.

MARCH, 1969

8000 0934 PQ

PRODUCED BY FORD