and exposure to asbestos has been evident since the report in 1935 by Lynch and Smith of a case in which lung cancer and asbestosis were both present. As additional cases in which the two diseases coexisted were reported, a causal association appears to have been gradually accepted by many authors, although some workers considered the correlation to be inconclusive. The present study was undertaken in an effort to determine whether a causal relationship did, in fact, exist between exposure to asbestos and cancer of the lung.

Since most earlier studies had been limited to enumerating the lung cancers found in certain selected samples, such as cases coming to autopsy or death certificates in which asbestosis was mentioned, it was apparent that they could not fulfill the requirements of an epidemiological and statistical approach to the problem. The present study was, therefore, designed to meet the requirements of this method.

After a preliminary survey to explore the availability of reliable information, data were gathered on workers in the asbestos mines in Quebec, based on their medical records. A cohort was defined as a group of asbestos miners having at least five years of exposure and who were in the industry in 1950. Data relative to their characteristics were collected and their status at the end of a six-year period of observation was determined. In the case of those who had died, an exhaustive search of death certificates and insurance records was carried out in order to determine as nearly as possible the exact cause of death. Mortality rates from lung cancer for the general population of the Province of Quebec and its various counties and for the Dominion of Canada, as well as the United States were calculated from statistics collected in the appropriate places. Comparisons of the rates obtained for asbestos workers and for the other population groups were made according to accepted statistical methods.

Records were obtained on 6091 persons who fulfilled the criteria of the cohort. It was not possible to trace 133 of these for the whole period, but 5771 of the remaining 5958 were found to be still living in 1955 or later. Of the 187 known dead, cancer of the lung was considered to have been reasonably proved in 9 and to be strongly suggested in 3.

The members of the cohort were studied with respect to age, length of employment, a weighted average of their exposure, and their smoking habits. It was found that 4673 were smokers within the definition of that term as used in this study. Thirty-four per cent of the cohort were more than 45 years of age, and thirty per cent had been employed for longer than 20 years. Thirty per cent had a weighted exposure which placed them in the category of highest exposure.

The mortality rate for lung cancer, as computed on the basis of nine "proved" deaths among the cohort was 25.3 per 100,000. When the three "suspected" cases were added, the "total" rate for the cohort rose to 33.8. The importance of the suspected but unproved cases in determining these rates has been reiterated because it is likely that such cases would not be included in the statistics for the general population and because they influence the results so markedly.

According to the findings in this study, the mortality rate from lung cancer does not appear to increase with length of exposure or with degree of exposure, a fact which presents strong evidence against the carcinogenicity of asbestos.

Comparison of the experience among the asbestos miners with that of various segments of the unexposed, comparable population shows that the observed number of deaths among the miners is not significantly greater than the expected number. The rate for proved cases among the asbestos miners (25.3 per 100,000) compares well with the rate of 22.5 per 100,000 for the rest of the Province, and 20.2 per 100,000 for adult males throughout the Dominion of Canada. It also compares satisfactorily with rates

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