REPORT TO
QUEBEC ASBESTOS MINING ASSOCIATION
RE PULMONARY CANCER
AND SUPPLEMENTARY MEMORANDUM
RE CANCER RESEARCH

Comments by Dr. J. F. Knox,
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In the Annual Report of the Chief Inspector of Factories for the year 1947, published by H.M. Stationery Office in January 1949, there is a section (P. 79) entitled "Asbestosis and Carcinoma of the Lung". Tables XXXII to XXXVI also refer to this subject. Although the first group of figures on page 2 of the Supplementary Memorandum of the Quebec Asbestos Mining Association bears some resemblance to them, they are not exactly similar and much qualifying information has been omitted. The important statement made in the Chief Inspector's Report is "During the 23 years 1924 - 1946 inclusive, 235 deaths, either caused by asbestosis or in which asbestosis has been proved at autopsy, have come to our notice. Cancer of the lungs or pleura was found to be present either as a cause of death or as a concomitant in 31 (13.2%) of these 235 cases". For comparison I can offer three groups of figures:-

(1) Numbers of post-mortem examinations of which I have records from 1938 - 1950

TABLE I

Number of Post Mortem examinations	Number of cases in which carcinoma was associated with asbestosis	Duration of exposure to dust	Percentage rate of cancer	Average age at death	Period of exposure prior to completion of full programme of protection (1932)
		years			years
100	10	22.4	10%	56.4	13.3

TABLE 2

Case	Death	Exposure in years	Age	Suspension to death in years	Started work	Period of exposure prior to completion of full programme of protection (1932)
1	1935	13	62	3	1922	10
2	1935	16	54	3	1919	13
3	1936	23	65	0	1913	19
4	1938	19	66	1	1919	13
5	1939	24	49	0	1915	17
6	1941	20	52	3	1921	11
7	1942	28	59	1	1914	18
8	1948	22	53	13	1925	7
9	1948	32	60	13	1916	16
10	1950	27	51	8	1923	9
Average	-	22.4	56.4	-	-	13.3

(*) Details concerning the 10 cases in column 2, Table 1.

Comment

No case has arisen yet of the association of carcinoma of the lung and asbestosis in this area in anyone starting work later than 1925. There was only one woman in the series. She was aged 51 and was suspended for eight years. Men and women are employed in about equal numbers in the scheduled areas of the Rochdale Works.

It is noted that according to Table 2, these cases of carcinoma have occurred in two groups - one of six cases with established asbestosis and suspended for three years or more, and another group of four cases. In the latter group, two were suspended one year before death and two not suspended at all. It is reasonable to assume that the suspension "disability" from which those who died within one year following suspension were suffering was in fact the early symptoms of carcinoma of the lung.

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Although this is an account of 100 autopsies it does not represent all the people who have died following employment in the Asbestos industry in this area. There is an unknown number of both men and women who, after working in scheduled areas for years, have drifted away to other industries or who have remained at home and whose subsequent deaths have not been reported to the Coroner and therefore made the subject of post-mortem study. There are no precise pathological criteria of asbestosis and the Coroner has linked the term asbestosis with many deaths where the degree of fibrosis was slight and the association between this and the major cause of death not apparent. On the other hand, the lungs of people without obvious disability and who have died suddenly of coronary thrombosis or cerebral haemorrhage have been found to contain the usual asbestos bodies, some patchy fibrosis and such changes as would undoubtedly have been associated in the Coroner's verdict with their employment if the death had occurred more slowly. It is considerations such as these which make me view all statistical material on asbestosis with reserve. As an indication of the difficulty of diagnosis during life, only 47 of these 100 cases were suspended during their lifetime.

(3) Cancer mortality figures extracted from the Registrar General's Statistical Review, 1940 - 1945, Vol. I. Medical:

On the subject of Carcinoma of the Lung on page 176, it is stated that "The rise in mortality from cancer of this site alone accounts for most of the recent increase in male cancer death rates from cancer of all sites at ages 35 - 55 which have been noticed above. Whereas in 1938 lung cancer contributed 23% of all cancer deaths of males, at this age period in 1945 it contributed 30%".

From Table LXXVII the following figures are obtained:

Males 45 - 65 years. Cancer deaths per 1,000 deaths from all non-violent causes 1943 - 1945 : 213

From Table LXXIX:

The proportion of deaths from cancer of lung to total cancers at ages 45 - 55 : 1/3 : 7.1%

Recent suggestions to account for this increased incidence of lung cancer include cigarette smoking and inhalation of petrol and oil fumes.

It seems difficult to understand the comparative figure of 1.32 given as the incidence of carcinoma of the lung in silicosis autopsies on page 2 of the Memorandum and in the Chief Inspector's Report of 1947. If this is so, it would appear that this silicotic group has a lower incidence of lung cancer than the general population.

(3) Figures derived from death certification in private practice.

In the last 100 death certificates issued by me, none of which concerned asbestos workers, there were seven lung cancer deaths with an average age of 62.7 years.

General observations

On page 3 of the Memorandum of the Quebec Asbestos Mining Association the incidence of lung cancer in the general population is given as 1.36% and in asbestos workers as 1.41%. This seems to me a more reliable method of estimating the incidence of the two groups than the autopsy material. In the section on page 3 of the Memorandum on the incidence of lung cancer in various types of pneumoconiosis, the data is attributed to Dr. Roodhouse Gloyne. This observer wrote the section on Pathology in Silicosis and Asbestosis (Lange) Oxford Medical Pubs. 1938. On page 245, he writes "carcinoma has been found in six cases by the writer at autopsy". If this figure refers to a series of 100 cases mentioned in the preceding paragraphs, his percentage rate was six. He further states that until more statistics are available it is impossible to draw definite conclusions as to the relation of the two diseases. In giving the figure of 121 under asbestos in Total cases of Pneumoconiosis, with 17 cases of lung cancer, he would seem to be singularly unfortunate in finding 11 cases in his next 20 autopsies. The total number of asbestos deaths up to the end of 1948 is given by the Chief Inspector of Factories as 247. Dr. Gloyne could hardly claim to have first-hand knowledge of a second series of 100 cases.

Without further qualification the statement in the memorandum that lungs of 169 individuals without pneumoconiosis, but employed in the same set of industries as above, yielded 14 cases of cancer of the lung or 8.3% means little. At today's carcinoma of the lung rates per man in the 55-65 age groups it would not represent more than 1% above the average for the country as a whole.

On the question of asbestosis as a carcinogenic agent, I would agree that the approach suggested by the Quebec Asbestos Mining Association is an excellent one. On the short-term programme, provided the statisticians have access to figures which are reliable, this should be an interesting report. As regards the long-term programme of experimental work, much of the preliminary study has been done and the animals suitable for the work, as well as the size and concentration of fibre which will produce experimental asbestosis, are well known now. As far as I am aware, there is no record of carcinoma of the lung occurring in an animal which was the subject of experimental asbestosis.

The third phase of the programme is one which will meet general approval. All concerned will benefit from the widest publication of accurate statistics and informed articles containing clinical studies on the asbestosis problem.

In considering the possibility of carcinogenic action of asbestos fibre, the emphasis so far has been on the lung. No question has been raised of carcinogenic action through contact with skin as is the case with certain mineral oils. I can state that neither my former partner, Dr. W. H. Bateman, whose practice in this area covered 45 years, nor myself in the last 25 years has seen a skin cancer in association with an asbestos skin wart. These warts are common and are due to the penetration of the skin by minute fragments of fibre. A fibrous tissue reaction of the foreign body type occurs around them.

J. F. Knox.