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MORTALITY FROM LUNG CANCER IN ASBESTOS WORKERS

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Sixty-one cases of lung cancer have been recorded in persons with asbestosis (Boemke, 1953; Hueper, 1952) since Lynch and Smith (1935) reported the first case. In view of the infrequency of asbestosis, this large number of cases suggests—but does not prove—that lung cancer is an occupational hazard of asbestos workers. The strongest evidence that it may be a hazard has been produced by Merewether and by Gloyne. Merewether (1949) found that lung cancer was reported at necropsy in 13·2% of cases of asbestosis (31 out of 235) but in only 1·3% of cases of silicosis (91 out of 6,884) and Gloyne (1951), on personal examination, found lung cancer in 14·1% of necropsies on subjects with asbestosis (17 out of 121) against 6·9% in silicotics (55 out of 796). Neither author gave full details of the sex composition of the groups examined, but since women form a higher proportion of asbestos workers than of persons employed in occupations liable to give rise to silicosis (coal-miners, stonemasons, pottery workers, foundrymen, metal grinders) and since lung cancer is less common among women, the differences in the proportions of cancer cases cannot be accounted for by differences in sex distribution. In fact the proportions which are more properly comparable with the findings in silicotic subjects are the proportions of lung cancer found among men with asbestosis, 17·2% in Merewether's series and 19·6% in Gloyne's.

Animal experiments are inconclusive. A positive result was reported by Nordmann and Sorge (1941) who found that of 10 mice which had been exposed to asbestos dust and survived for 240 days, two developed lung carcinoma. Smith (1952), however, considers that one of the "carcinomas" was, in fact, an example of squamous metaplasia and that the other, an adenocarcinoma, may have developed spontaneously from the common mouse adenoma. A negative result has been reported by Vorwald and Karr (1938). The majority of workers (cited by Hueper, 1952) consider that a causal relationship between asbestosis and lung cancer is either proved or is highly probable and the reality of the relationship was agreed at the recent International Symposium on the Endemiology of Lung Cancer (Council of the International Organizations of Medical Sciences, 1953). A minority, however, remains sceptical (Cartier, 1952; Warren, 1948), and, according to Hueper (1952), Lanza and Vorwald, so that it was thought desirable to undertake a fresh investigation.

Necropsy Data

Since 1935, records have been collected of all the coroners' necropsies on persons known to have been employed at a large asbestos works.* Pathological diagnoses in 105 consecutive cases are summarized in Table 1. Details of the cases in which lung cancer was found are shown in Table 2. During the first half of the period eight deaths occurred in which lung cancer was found in association with asbestosis, while in the second half of the period there were seven such cases and a further three in which lung cancer was found without asbestosis. The number of asbestos workers employed at the works increased steadily from 1914,

TABLE 1

CAUSES OF DEATH DIAGNOSED AT NECROPSY AMONG PERSONS EMPLOYED AT AN ASBESTOS WORKS (1933–52)

Cause of Death	Asbestosis Present	Asbestosis Absent	All Cases
"Heart failure"	34	11	45
Pulmonary tuberculosis ..	12	9	21
Lung cancer	15	3	18
Other diseases of the respiratory system	10	4	14
Other diseases	4	3	7
All causes	75	30	105

* Necropsies on asbestos workers are ordered by the coroner when, in his opinion, there may be a question of asbestosis being a contributory cause of death.