

STUDIES OF CARCINOGENESIS OF ASBESTOS FIBERS
AND THEIR NATURAL OILS*

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The mode of action of asbestos in producing asbestosis and neoplasia is at present little understood. Pulmonary fibrosis, the main feature of asbestosis, has been ascribed to mechanical or chemical factors, or to a combination of both; the mechanism of carcinogenic action is almost completely unknown.

Two forms of neoplasia in man are associated with exposure to asbestos: bronchogenic carcinoma¹ and diffuse pleural mesothelioma.²

THE TYPES OF ASBESTOS INVOLVED IN MALIGNANCY IN MAN

"Asbestos" is the generic name given to a class of fibrous mineral silicates which may vary considerably in physical and chemical composition. In some studies in the past the term asbestos has been used without proper definition and the type of material used remains unidentified.

A priori, the demonstration of differences in the carcinogenic activity between different types of asbestos, either in epidemiological or experimental studies, would open the way to a critical investigation of asbestos carcinogenesis.³

Studies of mortality by district of residence⁴ have suggested that exposure to crocidolite asbestos in the North-Western Cape carries with it a distinct risk of developing malignant disease. In the case of the crocidolite mines in the North-Western Cape, asbestos mining districts showed a three-fold excess of deaths from lung cancer as compared with adjoining districts, and as compared with control districts of similar population and degree of urbanization. This latter comparison is important since in South Africa, as elsewhere, lung cancer mortality is much lower in rural than urban districts. The excess was seen in both males and females.

Similar figures for cancer mortality in the eastern and north-eastern areas, where chrysotile and amosite asbestos are mined and milled revealed no excess mortality from any form of cancer. In these regions, however, the relative proportion of the population exposed to the asbestos is considerably reduced by comparison with that in the North-Western Cape. Although the standardized mortality ratios might suggest that exposure to

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