Pathological mechanisms

For various diseases in relation to uptake of asbestos in the human body (see chapters VIII, IX, X) a direct relationship has to be accepted; a precise explanation of the pathological mechanism is not available.

Development of lung fibrosis in asbestosis may originate from asbestos fibres penetrating the alveolar epithelial cells, interfering with cell- and enzyme-activity (Beck et al 1972, 1975). This leads to the conclusion that the fibre form is the most important factor - this will be discussed further on in this chapter.

Asbestosis may develop from exposure to all four important types of asbestos, regardless of the dimensions of the inhaled fibres, the longer ones however seem to be more pathogenic.

In relation to the asbestos induced excess incidence of cancers Gilson (1973) lists the following factors: dose and duration (see chapter X); type of fibre; age; sex; occupation; and cofactors (particularly smoking). The four important types of asbestos apparently differ in their biological effects, as well as in their deposition in the lungs. Epidemiological evidence leads to the conclusion that the incidence of bronchial cancer as seen in asbestosis, does not depend upon the type of asbestos but mainly on the dose level. However, in view of the established fact that there is a multiplicative effect between cigarette smoking and exposure to asbestos dust the statement that in occupationally exposed populations an excess incidence of bronchial cancer is only associated with asbestosis needs reassessment.

The incidence of mesothelioma is linked to the type of asbestos. There is a general agreement that the risk of mesothelioma is fibre-related in the order crocidolite > amosite > chrysotile > anthophyllite; the magnitude of the difference between, for example, crocidolite and chrysotile is not well established. Lewinsohn (1974) presented a review of studies, centered around this theme.

Amphibole fibres usually have a rectolinear shape in contrast to the "curly" shape of chrysotile (see chapter I). Amphibole fibres therefore may penetrate more efficiently through lung tissue, and reach the pleura rela-