

PROTECTIVE ACTION OF ALUMINUM COMPOUNDS

When colloidal aluminum hydroxide had been added to a suspension of long fiber chrysotile prior to injecting this suspension intratracheally into rats, the aluminum compound did not prevent the irritation of tissue due to chrysotile. If anything, the acute inflammatory response evoked by the injected fibrous mineral was accelerated. One month after the last injection of the dust suspension the bronchiolitis was becoming fibrous. King and his associates also found that aluminum failed to protect pulmonary tissue from the irritation caused by asbestos fibers¹²; in their experiments metallic aluminum was used instead of the hydroxide.

FORMATION OF ASBESTOSIS BODIES

The iron in the coating of the asbestosis body appears to be derived from blood or tissue elements and not, as has been suggested, from the mineral fiber. After two kinds of chrysotile were injected subcutaneously into the groin of a guinea pig—one kind containing 2 per cent and the other 0.2 per cent ferric oxide—the asbestosis bodies were equally numerous at both sites of injection and showed no difference in their reaction to prussian blue, the reagent which stains iron. This finding is in agreement with that of Giroux.¹²

TISSUE REACTION TO ASBESTOSIS BODIES

Asbestosis bodies recovered from human lung tissue and injected intratracheally into guinea pigs failed to produce a fibrous reaction. The material for injection was obtained by digesting with sodium hypochlorite solution the lung tissue removed at autopsy from an asbestos worker. The asbestosis bodies could be seen in the guinea pigs for at least a year after injection. This experiment shows that the asbestosis body has a rather resistant coating which is not destroyed by moderate hypochlorite treatment, which may be maintained in vivo for a year or longer and which renders the fiber incapable of producing fibrosis. It thus appears that the coating is a protective mechanism. This thought was expressed by Beintker as early as 1934.¹³

THEORY OF IRRITANT ACTION

Two hypotheses have been proposed to explain the tissue irritation and reaction caused by asbestos fibers: the chemical and the mechanical. In the chemical theory, which is based on experience with quartz, it is assumed that the asbestos minerals dissolve in the body fluids and that in this process their bases are leached away to leave silica in a form capable of irritating tissues. According to this hypothesis asbestosis is merely an indirect silicosis. Several facts make the chemical theory untenable: Intratracheal injection of brucite fibers, which had a silica

12. Giroux, M.: *Amiantose expérimentale: valeur pathognomonique du "corps d'amiante."* Laval med. 9:239, 1943.

13. Beintker, E.: *Über die Asbestosiskörperchen: Bemerkungen zu der Arbeit von Beger.* Virchows Arch. f. path. Anat. 223:527, 1934.