EXPERIMENTAL STUDIES ON BIOLOGICAL EFFECTS OF TREMOLITE TALC ON HAMSTERS

by

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My name is William E. Smith. I am director of Health Research Institute at Fairleigh Dickinson University, Madison, N.J. I am a doctor of medicine. Over the past 25 years, I have studied more than 200 chemical materials for carcinogenicity in animals and have reported results of these tests in scientific journals. In the past 8 years my associates and I exposed animals to various mineral dusts, maintained them over their natural life spans, and studied them for pathologic changes by gross and microscopic examination of their tissues and organs.

The principal purpose of these latter studies has been to develop information on possible fibrogenic and/or carcinogenic properties of various preparations of mineral dusts. The principal support for this work was provided by Research Grant EC 00226 from the Bureau of Occupational Safety and Health, U.S. Public Health Service. Thus far, we have published five papers (listed in the bibliography section of this paper) describing some of our findings in animals exposed to various preparations of asbestos. Today, I would like to offer a brief summary of our experiments with asbestos and describe as yet unpublished data from studies we have made with a sample of talc containing a large amount of tremolite.

From our work, we identified the Golden Syrian hamster as a species that was capable of developing pulmonary fibrosis resembling asbestosis seen in man. Those experiments were done by repeated intratracheal injections of chrysotile or amosite asbestos.

The method used for those experiments, weekly intratracheal injections, is technically tedious and time consuming. We found that we could compare the relative fibrogenicity and carcinogencity of mineral dusts more conveniently by depositing the dusts by a single injection into the pleural space of hamsters.

After single intrapleural injection of preparations of the chrysotile, amosite, anthophyllite, or crocidolite types of asbestos, we found that hamsters developed extensive pleural adhesions. These adhesions were composed mainly of round cells and multinucleated giant cells in the first few months after injection. Within 5 months, these adhesions became densely fibrotic. Adhesions induced by the chrysotile, amosite, anthophyllite, or crocidolite types of asbestos tended to extend over large areas of the surfaces of the lungs.

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