12/5/69 - CC: Dr. George W. Wright
S. Speil - J. Leineweber

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BY AIR MAIL

26th November 1969

Private and Confidential

PLAINTIFF'S EXHIBIT
JM-1954

Dr. F. L. Pundsack,
Vice President for Research &
Development,
Johns-Manville Research & Engineering Center,
P. O. Box 159,
Manville, N.J. 08835,
U.S.A.

Dear Fred,

During my last visit to Manville and the subsequent visit by Mr. G. F. Heron, both of us saw something of your light-weight disposable respirator. This development was naturally of considerable interest to us, but we were somewhat concerned about the use of glass micro-fibres in the construction materials of the mask.

At the time of our visits we had some very preliminary information which suggested that fibre glass fibres could be fibrogenic, but, because of the extremely preliminary nature of our work with glass, we refrained from comment. I thought, however, you might like to hear something of the results reported by John Davis, one of our sponsored research workers at Cambridge University, in his annual report made recently to the Asbestosis Research Council.

I quote from his report:-

"Experiments on the pathogenicity of other minerals.

"These tests using intrapleural injection have continued throughout the current year, and it is now possible to divide the test samples into three categories.

These are:-

1. Minerals which produce an initial foreign body reaction, but which dissolve with or without toxic effects. With dissolution the foreign body reaction declines and may completely resolve. In this class are:- Brucite, Forsterite (produced by heating chrysotile), calcium silicate, and probably synthetic chrysotile.

(cont'd.)

2. Minerals which produce a foreign body reaction that results in the formation of large granulomas which enclose the dust. These granulomas lie loose in the pleural cavity, do not form adhesions, and appear to cause the animal no discomfort at all. The minerals in this class do not appear soluble and the granulomas do not decrease in size with age. Fibrosis occurs within the granulomas, but not elsewhere in the pleural cavity. In this class are:- Talc, Serpentine, Magnetite, Pyroxene, Olivine, Chlorite, Chromite and glass fibre that has been machine ground.

3. Minerals which produce large spreading granulomas. These lesions adhere firmly to the chest contents and may cause massive adhesions between the lung lobes, the diaphragm and the chest wall. These granulomas are often replaced by fibrous tissue, and in extreme cases the chest contents can appear as a solid mass of fibrous tissue in which are embedded the heart and lungs. In this class are:- All types of asbestos and glass fibre that has been prepared by gentle grinding.

The finding that the method of preparation of glass fibre samples can greatly alter the pathogenic effects of this dust, represents the most interesting results of the year. The fibre samples used contain many small fibres of 250-1000μ in diameter which is within the size range of asbestos crystals. Gentle preparation methods leave these small fibres undamaged and samples so treated produced fibrosis with adhesions. Machine grinding appears to break up the fine filaments faster than the large, and these samples produce only granulomas without adhesions. These experiments indicate that the shape of the particle may be more important in fibrosis than its chemical nature. Indications at present are that the dangerous particle may be a fibre several microns in length, but only 250° - 1000° in diameter. So far in industrial processes asbestos is the only material that has given such particles, but the use of very fine glass fibre may provide another source of these particles. Work in the coming year will be focused on this point. The results from the pleural cavity seem definite. It remains to see if the same results are obtained from lung tissue.

This work by John Davis is limited to intrapleural injection of mice, and Paul Holt at Reading University is following the work in inhalation experiments. Meantime, you will appreciate our reservations about the use of face masks prepared from materials containing fine glass fibres.

With kindest regards,

Yours sincerely,

Kenneth