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State of Montana
State Board of Health

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EXECUTIVE OFFICER AND SECRETARY

HELENA, MONTANA

PLAINTIFF'S EXHIBIT WRG-405

July 7, 1961

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City of Minneapolis
Division of Public Health
Public Health Center
250 South Fourth Street
Minneapolis, Minnesota

Dear Kenneth:

Thank you for your letter of June 28, 1961 concerning the "effect" business. Perhaps this will help me to remember which one to use correctly.

Relative to the vermiculite question, several samples collected at the source of all vermiculite mined in the Western United States indicate a free-silica content of less than two percent. Although the dust concentrations might be extremely high, the free-silica content, as noted, is quite low.

In a letter received from Mr. Paul F. Woolrich of the U.S. Public Health Service a few years back, he described vermiculite as, "an essentially hydrous magnesium mica which was usually an alteration product of local phlogopite or biotite micas. Attempts to assign a definite minerological formula for vermiculite has been unsuccessful because of its highly variable composition. However, analysis of typical vermiculite from Libby, Montana is as follows:

"SiO_2	41%	Silicate	CaO	1%
Al_2O_3	18%		Na_2O	1%
Fe_2O_3	7%		K_2O	1%
MgO	21%		H_2O (at 105° C)	11%

Phlogopite mica is: $H_2KMg_3Al(SiO_4)_3$

Biotite mica is: $(H, K)_2 (MG, Fe)_2 Al_2 (SiO_4)_3$

A type of pneumoconiosis has been found to occur among workers whose only exposure was to mica dust. Dressen, et al, in an examination of 57 men exposed to dust generated by grinding hand-sorted mica (which X-ray examination of 456 men, with more than half their industrial exposure in the mica field, and an additional group of 79 workers so employed,

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revealed dust pathology of 9.4 percent and 11.4 percent, respectively--double that in a comparable group with no mica exposure."

As we discussed, it might be productive to look into the asbestosis angle, since a portion of the mined ore contains from five to twenty percent short fibre asbestos. There is an attempt made in the milling process to remove the asbestos which I believe is essentially successful; however, there is no doubt that some of the material is not excluded and would show up in the final product. At an expanding plant where the vermiculite is heat treated to produce the product zonolite, a maximum free-silica content of four percent was noted in the rafter dust.

A few years back, we sent in some sputum samples to the U.S. Public Health Service for examination for asbestosis bodies which are typical in workers having asbestosis and all were negative; however, the samples may not have been satisfactorily collected and no further work was done in this area. Only three men submitted samples and it would be unlikely that three out of ninety or so in the plant might have been afflicted with this disease.

I hope this information will be of some value to you. I would be interested in learning the results of your study in this field.

Sincerely yours,

Benjamin F. Wake
Industrial Hygiene Engineer
Division of Disease Control

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