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COMPANY  
BEAVER FALLS, PENNSYLVANIA

704909

December 27, 1951

Dr. Donald M. Gardiner  
Division of Biology and Medicine  
United States Atomic Energy Commission  
P. O. Box 6140 A  
Chicago 80, Illinois

Reference: Letter of 12/18/51 concerning

Dear Dr. Gardiner:

The work of \_\_\_\_\_ while at NEPA included coating already sintered beryllia (BeO) slabs about one square inch in cross section. Occasionally these had to be cut from bars in a Felker Dimet cut-off machine that was well enclosed and exhausted. However, it was necessary to set the bar in a vise under the wheel prior to cutting. The inside light on the machine was actuated by the same switch that controlled the circulating coolant laden with beryllium and uranium compounds (exact ones still classified, but mentioned in NEPA reports). So in setting the bar in preparation of the cut, there was opportunity to inhale oily mist contaminated with beryllium and uranium compounds even though the fluid valves were closed. Also after cutting, hand lapping of the beryllia slabs was sometimes necessary. This was accomplished under a hood, but due to the exactness of the work, would have to get his face quite close to the lapping plate (often just a silicon carbide cut-off wheel laid flat.)

Other opportunities for inhaling beryllium and uranium dusts were incurred in batching and heating in crucibles until melted (fritting) amounts up to 500 grams. Gaseous evolutions during fritting would carry minor amounts of these dusts into the fritting furnace atmosphere. It was occasionally necessary for Scholes to put his head close to the furnace while warm and cold to make equipment adjustments or repairs.

He was working in the room (room 26 of the Materials Laboratory) when an accident threw large amounts of uranium compound dust into the air. A compact incorporating an uranium compound ignited while being loaded into a die prior to heating under pressure (hot-pressing).

The greatest opportunity for inhaling beryllium compounds (and perhaps uranium) was in heating his specimens as high as 2200° C. The exit gases were exhausted, but repairs required momentary interruption of the exhaust

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or required that \_\_\_\_\_ get quite close to the exit gas outlet. Fine condensation of beryllium oxide in his furnace tubes would break loose while being cleaned or repaired under a hood; this would momentarily raise the dust level immediately about his head.

He worked at times in a room where silicon and other metal vapor coating was carried on. This room's atmosphere carried a higher than normal concentration of HCl vapor (sufficient to rust the grease coated steel work). Ether vapors were occasionally strong in this room. MoO<sub>2</sub> vapors were present about the furnaces. No appreciable mercury vapors were present, though \_\_\_\_\_ once handled about two liters of mercury in cleaning and refilling the arc pot of a 20 KW Ajax induction furnace converter. There was always a bit of mercury spilled about the condensers of this furnace which \_\_\_\_\_ used quite often, though any vaporized mercury should have been quite away from him and partially exhausted (partially only, since the air conditioning apparatus recirculated some of the room atmosphere).

His frits (glass melts) at times incorporated minor amounts of fluorides, mainly CaF<sub>2</sub> and NaF, though no noticeable fluoride fumes were in the atmosphere.

In summation, \_\_\_\_\_ had ample opportunity to inhale vaporized beryllium oxide and fair amounts of finely divided simple uranium compounds. It would appear from this note that he waived ordinary caution and that the Health Physics monitors were not active; neither is true. \_\_\_\_\_ performed his duties with as much caution as practically possible and the monitors strove constantly to reduce such hazards to a practical minimum. But our controls had to evolve from self-imposed caution at the start of a new laboratory to the well regulated (final) system in three years, while strong pressure was imposed on the laboratory staff to accumulate the necessary engineering data. Corners were occasionally cut in lab procedure to effect quick results and the carelessness of others in the laboratory, of course, affected \_\_\_\_\_.

Should some other items of possible service to you occur to me, I'll write again.

Yours sincerely,

Paul Yavorsky

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Retyped 1/10/52  
GAH/hc

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