C O P Y

March 10, 1925.

Dear Mr. Yant:

Enclosed is blue print of settling curves on $PbBr_2$ fume and ZnO fume, both of which I think will interest you. The "apparent foot candles" as ordinates refer to readings on Tolman and Vliet's Tyndallmeter (JACS 1919, page 297) while the concentrations and abscissae are self-explanatory. Tolman and Vliet found a linear relation between illumination intensity and concentration when dispersion was good and the line curved when it was not--an effect due to flocculation and to particles getting in each other's way. This we find with Kadox and also with burned Zn--both give pronounced flocculation.

Your $Pb(Et)_4$ experiments you recently reported were done with high rates of ventilation. Ours are intended to apply to still air only. We get some air motion in sampling with the precipitator (10 litres per min.) and some from sampling with the Tyndall meter. In the latter case the air used is returned to the cabinet but the escape from the precipitator passes direct to the room air and the air withdrawn from the cabinet is replaced through a mask impenetrable to the fume particles. The cabinet volume is about 75000 liters so this effect is probably unimportant.

The $PbBr_2$ fume is especially nice to work with because of the remarkable dispersion you get from the very start. It passes through any but excellent filters (masks) and has very little tendency to increase the resistance of the mask by plugging. You found a high percentage of the inhaled particles were exhaled and I think this is probably why. However, I honestly feel your position is not strong until you show a good deal more of the same thing. I think the betting is distinctly on your side but I cannot see you have proved anything but that powerful ventilation makes the lead hazard fromethyl gas negligible or perhaps nil. You have not shown that it does not exist in poorly ventilated garages. To say that CO effects would precede the lead effect does not answer this because Pb is cumulative and you considered the Pb fume as a gas in your ventilation and then determined it as made up of particles. Also I think you ought to give something about the size of the particles and their dispersion both of which are very important in the question of the amount retained in breathing.

Your breathing experiments were fine and we have copied the experiment in ourown work.

I will send you some slides of $PbBr_2$ fume if you wish.

Sincerely yours,

(signed) Philip Drinker