

March 14, 1941

Dr. George Calingaert
Ethyl Gasoline Corporation
7600 W. Eight Mile Road
Detroit, Michigan

Dear George:

Our recoveries in the balance experiment ran from 96-100% and about 90% of the lead recovered was found in the filter.

We did not attach any significance or offer any explanation of the fact that our results in this respect differed from yours by about 20%, as different stoves were used. It does, however, suggest the advisability after we report these results, of the Army selecting a number of stoves and analyzing the filters after a period of use with leaded fuel, as the hygienic implications of the two sets of results are significantly different.

What we hope will be our last run, is in progress. After the first few runs, we operated the stove daily for a period of 20 or more days and propose then to repeat our initial balance experiment on what may be considered a well used stove. If the last run checks the first two within reasonable limits, I believe we will have a practical answer to the problem.

Of the total lead in the flue gases, approximately 73% comes off in the first hour and almost 4/5 of this amount in the first 30 minutes. At Graham's suggestion, we drew off and condensed a portion of the vapor-air mixture before it reached the flame and found significant amounts of tetraethyl lead present in the first 30 minute period in which the generator tube was not yet hot. Even when well heated, 10-16% of the tetraethyl lead is not cracked in the generator tube, but goes on to the flame where it is decomposed. Whether or not we should change the place of the filter or increase the amount of surface within the generator tube, raise its temperature, or otherwise attempt to improve this stove, is a matter which has not yet been decided, but should be before we complete our work in the next few weeks. It seems to me that what we have done points the way fairly directly for the Army and with the facts in their hands, it should not be too difficult for them to improve the stove to a very considerable degree.

Cordially,

WM:vr

Willard Machle, M. D.