

March 10, 1955

Dr. R. E. Eckardt  
Esso Research and Engineering Company  
P. O. Box 51  
Linden, N. J.

Dear Doctor Eckardt:

The problem of the concentration of lead in the atmosphere of various areas, including the streets and highways, of American cities is one which we have investigated both intensively and extensively over a period of years, - indeed long before the concern about air pollution became the popular pastime it now is. I send you certain fairly recent publications of the Laboratory on this subject in illustration of some of the things we have been doing. Much of the work, especially as it relates to lead, has been published.

We have also a considerable body of data on the lead excretion of persons who may be expected to be subjected to the maximum intensity of exposure to lead derived from the exhausts of motor vehicles, and we are planning a further extensive survey of this - which is really the crux of the problem - during the present year. There are, therefore, more data and more pertinent data on this subject in our hands than in those of the combined group of investigators elsewhere. Certainly there is room for further study of the problem, but it can be said fairly that it is well in hand. I might point out that this problem, in one aspect of another, has been recognized by us for more than twenty-five years, as the primary problem of the entire tetraethyl lead industry. We should have been culpably short-sighted if we had not done so. This has been the essential background of our investigation of the basic metabolism of lead in the human organism over this period of time, and although this work has served other purposes, this has been its economic justification and its central hygienic purpose.

With this introduction I may say that our friend from France is all wet, unless there is some situation in France which is totally different, basically, from that in the U. S. A. Certainly no such concentrations of lead as he is talking about are derived from the exhausts of French automobiles. It may be that the soil and roadways of France are so impregnated with leaden missiles, in consequence of wars, as to give rise to clouds of leaden dust. However, unless this or some other unusual

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Enc. The Nature of Atmospheric Pollution in a Number of Industrial  
Communities - Cholak  
Measurement of Air Pollution - Cholak  
Results of a Five-Year Investigation of Air Pollution in Cincinnati  
Schäfer and Hoffer

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set of factors - and this is not impossible, but unlikely - has suspended lead in the atmosphere of France to a remarkable degree, the figures provided on lead are almost two decimal places removed from the truth.

The general level of lead concentration in the air of Los Angeles, during periods of severe inversion, is of the order (by range) of 0.8 to about 14.0 micrograms per cubic meter, the mean value, for some hundreds of observations, being something less than 4.5 micrograms per cubic meter. These are the highest values we have found, generally, in the cities of the U.S.A., of which ten or twelve have been investigated with varying degrees of intensity.

It is worth while to recognize that the quantities of lead being dealt with in this work are small, that the methods of sampling and analysis are very exacting, and that the opportunities for error of even a gross type are everpresent. Fragmentary results, therefore, are less than useless, since they are misleading. (As to the CO in the air, much depends upon how and where one takes his samples. If one gets at all near the tail pipe, the results are obviously quite high, but without hygienic significance.)

A further matter of great interest and importance is found in the fairly comprehensive investigation of the nature and quantity of the lead which escapes from the tail pipe of automobiles under varying conditions of operation on various fuels. On my urging this investigation was undertaken in the Detroit Laboratories of Ethyl Corporation. It is now nearly completed. It aids very much, indeed, in explaining why it is that the quantities of lead found suspended in the atmosphere - insofar as these quantities are derived from automobile fuel - are so comparatively small.

Lead from other sources is of great significance in this total problem. For example, when the city ordinance which regulates the burning of coal in Cincinnati was brought into enforcement at the end of World War II, the lead in the Cincinnati atmosphere, generally, decreased to a little more than half its previous level. This is not, then, the simple problem that it might be thought to be.

This somewhat lengthy letter may or may not have been fully justified by your query, but it seems to me that you, in particular, ought to be acquainted with what we have been doing to guide Ethyl Corporation in this crucial matter.

With kindest regards,

Sincerely yours,

Robert A. Kehoe, M. D.

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