

October 21, 1938

Mr. Howard W. Ambruster
Westfield
New Jersey

Dear Mr. Ambruster:-

This laboratory has not been directly concerned with the study of the problem of spray residues and consequently we have not published any articles which deal primarily with this problem. I can not, therefore, send you any work on this question. On the other hand, I am very glad to express my own point of view concerning this problem. Moreover during the past year and a half, I have been carrying out some observations on human subjects which will serve to determine the fate of certain small quantities of lead ingested daily. I began this work for the reason that some rather extensive observations in industry lead me to conclude that up to a certain point of lead exposure, the lead absorbed could be disposed of adequately by the normal human body.

Briefly to state the situation as I see it, our experience in industry leads us to be fairly certain that if the lead content of the atmosphere breathed by workmen does not exceed 1 to 1-1/2 milligrams per 10 cubic meters of air, cases of lead poisoning do not occur. The exposure under these conditions is such that one has reason to believe that these individuals may absorb into the body as much as 0.5 to 1.0 milligrams daily. If, under these conditions, men are not poisoned, it must be because the body is able to handle quantities of lead of this order of magnitude. In view of the fact that industrial exposures are almost wholly respiratory in origin, these facts do not permit us to draw far reaching conclusions with relation to the swallowing of lead. However we have seen over a period of years that the average American takes into his body in his food approximately 0.25 milligrams of lead daily. (The quantity varies from traces up to something more than a milligram a day, but the mean value is quite stable up to a quarter of a milligram per day.) Lead poisoning definitely does not occur under these conditions. Studies of normal individuals have shown quite conclusively that poisoning does not occur because there is no progressive accumulation of lead to any significant extent within the body. That is to say, the lead output is equivalent to the lead intake over long periods of time, so that the

concentration of lead within the tissues does not materially increase after an equilibrium has been established.

From indirect observations I became convinced that the lead intake of the normal human body could be increased several times without danger of lead poisoning. I, therefore, began feeding experimental subjects definite quantities of lead while following carefully their total lead intake and their total lead output. As I anticipated, there was an initial comparatively short period during which lead accumulated in the bodies of these subjects rather rapidly. The rate of lead output increased steadily, however, until at a certain point output again became equivalent to intake. These experiments are not completed and they have not been published, but I am quite sure they are of great importance in connection with the problem of the hazard of spray residues.

I am disposed to believe that at the present time there is no very great danger to the community in connection with spray residues. I am firmly convinced that the activities of the Pure Food and Drugs Bureau should be maintained and that every effort should be made to see that foodstuffs in general are kept within the limits set by the Secretary of Agriculture. I am not wholly convinced that the action of the Secretary in recently raising the lead tolerance to 0.025 grains per pound was a wise move. On the other hand I do not view this change with any alarm, and I do not anticipate any difficulties as a consequence of this new regime. Moreover with the experimental work which is now going on in this field, I think we shall probably have a sensible answer within a reasonably short period of time as to what the tolerance should be. Previously we have had either no information or inadequate information of a physiologic type on which to base these tolerances. I think every effort should be made to carefully study the problem and to arrive at some conclusions. It is my very definite opinion that there has been much too much talk on both sides of this question, and much too little experimental work. For this reason I do not believe there is very much point in further discussion of the problem until there has been a great deal of enlightened experimental work.

Very truly yours,

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Robert A. Kehoe, M.D.

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