

April 24, 1970

Sven Forssman, M.D.
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Fack, 104 01
Stockholm 60, Sweden

Dear Sven:

I have consulted Mr. Cholak of our technical staff about your question concerning the measurement of the exposure of workmen at service stations to organic and inorganic lead separately. He tells me that he and his associates have not carried out any intensive or extensive determinations of the type which you wish to investigate. What has been done has been somewhat easier to do, in that some measurements have been made of the organic and inorganic lead content of the air at certain sites in service stations. Enough work has been done to demonstrate that measurements can be made under appropriate circumstances. The quantities of organic lead, that is, of the alkyl lead, are small, somewhat variable and evanescent, and frankly have not been considered to be important. The latter conclusion would be of no significance were it not for the fact that men who work regularly in the manufacturing plants, where the alkyl lead is always present in measureable (but small) quantities, have suffered no ill consequences from such exposure. We have many men who have been subjected to such exposure for years, without suffering any deterioration therefrom. The facts here are entirely clear, and the men are under virtually continuous expert medical supervision. I can see no means by which the service station employee can be regarded as subject to hazardous exposure to lead in any form. As you are aware, no doubt, we have investigated the situation of these men repeatedly, and have never found anything to be concerned about in their environment or occupation. This is not, of course, to suggest that no further investigations need be made, especially outside the U.S.A.

Now as to the matter of organic lead about which you asked, there are certain possibilities, which I believe you will have to investigate carefully before initiating your investigation. To the extent that the urine of service station attendants contain alkyl lead compounds, the quantities will be very small and will require unusually sensitive methods for their detection and quantitation.

1. Mr. Cholak suggests that a differential solution, as of hexane, cyclohexane or benzene will be required to extract the alkyl lead from the urine. Presumably, the inorganic salts and water will not be taken up in such a solvent. The blood will have to be laked before the use of such an extraction.
2. The lead removed by the organic solvent will have to be determined by one of the more sensitive methods of analysis.
3. It may be that gas chromatography can be employed in the determination of the alkyl lead compound, in the extraction medium. If so, it is likely that the sensitivity of this method will be sufficient for the purpose.

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I am sorry that we cannot give you more definitive advice. We can only suggest a means of approach to the problem. As I have suggested, we have not considered this to be a very promising or necessary type of investigation, although there is no doubt that it might yield some interesting technical results.

If you wish me to do so, I can probably pursue this subject further.

With best regards,

Sincerely,

Robert A. Kehoe, M.D.
Professor Emeritus of
Occupational Medicine

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P.S. It was indeed a great satisfaction to me and Lucile to see you and Mrs. Forssman, repeatedly, in Tokyo. I regret that these meetings are so infrequent and brief. I present our sincere regards to both of you.

RAK

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