

Standard Oil Company of New Jersey,  
26 Broadway, New York City 4.

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May 20, 1952

Dr. R. E. Eckardt  
Esso Laboratories  
Standard Oil Development Company  
P. O. Box 51  
Linden, New Jersey

Dear Doctor Eckardt:

In reply to your letter of May 12 we will be pleased to assist you in any way we can. The paper which we presented at the Health Conference in Cincinnati is being edited for publication purposes and we will be glad to send you a pre-publication copy as soon as one is ready.

We agree on the need for additional information on urinary coproporphyrin excretion but feel that only quantitative data are useful. When we know the relationship between the levels of urinary lead and coproporphyrin we can set up graded standards for visual comparison purposes, but I believe that we are not at present able to do so. It seems that the determination of coproporphyrin is a useful auxiliary means of confirming bonafide lead poisoning, but is unsatisfactory as a screening method for measuring the extent of lead absorption. The analytical methods are in such a state of flux that we are even uncertain as to the quantities of coproporphyrin normally present in the urine of healthy individuals with no industrial lead exposure, quite apart from the levels of coproporphyrin associated with lead absorption. It may well be that the appearance of coproporphyrin in the urine lags so far behind lead absorption as to be of no practical value as a means of measuring lead absorption and anticipating lead poisoning. On the other hand, the analysis of lead in blood and/or urine provides information on which unfailingly lead poisoning can be avoided. By this means it appears, from our data, that significant changes in the coproporphyrin levels in the urine are also avoided. In other words, the coproporphyrinuria associated with lead absorption appears to be a manifestation of lead poisoning.

We believe that coproporphyrin determinations made routinely along with lead determinations in the blood and urine are needed to establish the exact relationship between lead absorption and coproporphyrinuria and that such analyses should be made whenever possible. We have been unable to obtain sufficient material to

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establish the relationship or the limits of concentration which are needed to indicate increased lead absorption. Since the lead industries are in a good position to obtain material for studying the relationship we are heartily in favor of studies which quantitatively determine the two.

The three papers on coproporphyrin given at the Conference complement each other and I would strongly recommend that all be considered before a program is set up. Our work has concerned itself with the development of an adequate analytical method. We feel that we can control some of the variables which affect the accuracy of analysis and that our analyses truly represent the coproporphyrin of the samples submitted. We have therefore taken the liberty of enclosing the exact details of this method in advance of our paper which discusses the variables in detail.

Insofar as standards are concerned we also obtained a standard from Dr. Watson (or Dr. Schwartz). We have checked it against coproporphyrin which we isolated from the urine of a lead poisoned individual and obtained good agreement indicating equal purity of the materials.

Dr. Kehoe has asked me to convey a note on this matter to you in this letter. It is attached herewith.

Cordially yours,

J. Cholak

JC:ma

Enclosures

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P. O. Box 51  
Linden, New Jersey

Dear Doctor Eckardt:

Mr. Cholak has shown me your letter and his reply, in which I concur. I wish, however, to call your attention to a point of some significance in connection with your interest in coproporphyrinuria as a phenomenon related to the lead metabolism. I seem to remember that some of your work relates to persons who are or may be exposed to tetraethyl lead. It is important to recognize that the behavior of lead with reference to the blood and the blood forming tissues, does not extend to such organic compounds as tetraethyl lead. Hematologic changes are never seen in tetraethyl lead poisoning, and the compound which stabilizes lead in high concentration in the erythrocyte, when inorganic lead is absorbed, is not formed or does not enter the erythrocyte when the source of lead absorption is tetraethyl lead. Therefore, you will not be able to employ determinations which are based on the abnormalities of the chemical cycle of the blood. Moreover, you will not be able to interpret the lead concentration in the blood under these conditions of exposure, since it is always low. It is necessary, therefore, to rely upon the rate of urinary lead excretion as carefully determined in the light of its diurnal variability, as a means of estimating the significance of occupational exposure to tetraethyl lead. This is the only method available, but, fortunately, it is quite satisfactory.

Sincerely yours,

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Robert A. Kehoe, M. D.

RAK ef

C.C.: Mr. J. Cholak (Blind)

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