April 25, 1935

Dr. Ivring Gray
Forty-one Eastern Parkway
Brooklyn, New York

Dear Dr. Gray:

I trust you will pardon my tardiness in replying to your letter of April 10th but not only have I been very much pressed by work and teaching, but I have also made it a point to look into the literature of the spectrographic work which has been done on skin punched samples.

My point of view concerning your case is dependent upon two factors: (1) the significance of the presence of lead in the excreta has been, I believe, very well established in quantitative terms in relation to known conditions of exposure and also in relation to the incidence of lead intoxication. I have previously expressed myself as believing that the interpretation of symptoms can not be made on the basis of the analytical findings, but only from careful study of the clinical picture. It has been established beyond peradventure that there is a relation between lead exposure, lead absorption, and lead excretion. It has not been established, however, in a conclusive manner that there is a definite relationship between the quantity of lead which has been absorbed and the existence or character of clinical symptoms. It is obvious that increased absorption in a group of persons results in the increased incidence of lead intoxication, but it may frequently be seen that certain individuals with a high rate of excretion are free of symptoms. I think it is necessary, therefore, to be cautious in regarding a measured lead concentration in any tissue or excretion as diagnostic of toxic effects produced by lead. (2) These relationships have not been worked out or at least have not been published in the literature in the case of the skin. Our experimental results on animals lead me to believe that the skin behaves somewhat erratically in relation to lead absorption. Therefore, until the limits of variation in unexposed and healthy individuals have been carefully worked out, I shall be quite unwilling to accept interpretations based upon observations on the skin for a variety of reasons. In relation to lead metabolism the skin is among the last tissues to be acceptable for the interpretation of lead metabolism. I am sure that at

present I have more data on the lead content of teeth in a variety of normal and pathologic processes than are available on the lead content of the skin. Nevertheless I am not willing to use the examination of teeth as a diagnostic procedure until we have so worked out the limits of normal variation that we can have a dependable body of data for comparative purposes. I think this point of view should apply rigidly to any analytical or spectrographic diagnostic criteria.

The above discussion will probably convey to you my essential agreement with your point of view that the evidence of abnormal storage of lead in the body is extremely tenuous and untrustworthy unless it can be shown that an abnormal excretory rate occurs or can be brought about by suitable means. I have already told you my point of view about the use of de-leading procedures for diagnostic purposes. In my opinion the best measure of the lead content of the body is to study the lead excretion under the most nearly normal physiological conditions. Here available data are very reliable. Under other conditions whether naturally or artifically induced, I am somewhat skeptical of our ability to make interpretations which are based upon sound physiological principles. Nevertheless, despite this point of view, I can quite readily agree with you that if you are unable to induce a heightened or abnormal lead excretion even under the influence of artificial means, there is certainly scant possibility that the person in question has abnormal amounts of lead in his body. If it were established to be true that connective tissue retains lead as the central nervous system does (and this has not yet been done), I would still say that the presence of apparently abnormal amounts of lead in the connective tissue must be for the present considered as without diagnostic significance.

Cordially yours,

RAK:is

Robert A. Kehoe, M.D.