



MEDICAL DEPARTMENT
OCCUPATIONAL MEDICAL SERVICE

CAMBRIDGE, MASSACHUSETTS 02138

September 21, 1965

Dr. Robert Kehoe
The Kettering Laboratory
University of Cincinnati
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Cincinnati 19, Ohio

Dear Bob:

Thank you for your letter of the end of August. I hope this short response reaches you before you leave for Chile so that I can send you my best wishes for the journey. If it does, please be sure to give my best to Jack Bloomfield^x and tell him that I have not forgotten the idea that I may sometime arrive and look at those remarkable underwater coal mines he told me about!

I am very much interested in the contents of your letter and have studied it with great care. I shall pay close attention, as I go about my clinical work to your statement that the metabolism of lead is remarkably stable. This is a new concept to me and I shall certainly go to some pains to test it against my own thinking as I have the opportunity in actual practice. I am sure that it will be a great satisfaction to you to be able to get in all the data that you have collected and put it together for publication.

With thanks to you for your courtesy in responding to my letters with such care and best wishes for your journey, I am

Sincerely yours,

Harriet L. Hardy, M.D.

HLH/jv

x and his friendly hospitalable wife

August 27, 1965

Harriet L. Hardy, M.D.
Medical Department
Occupational Medical Service
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

Dear Harriet:

Your letter of August 24th arrived as we (my wife and I) are about to depart for Santiago,, Chile, where I am to help Jack Bloomfield for a few months, as a consultant to the Pan-American Health Organization, in getting things going in an Institute of Occupational Health in the University of Santiago. After that I expect to return to the Kettering Laboratory in some capacity which will give me, at least, office space and access to the library. Many previous years have been spent in the accumulation of data which have not been studied properly and published, and I expect that they will answer some of our questions. In any case, if I make it, I hope to put together a monograph which will bring this matter as far up to date as it can be brought. I shall be in and out of the Laboratory, no doubt, for on Mrs. Kehoe's account we should not any longer make Cincinnati our year-around residence.

I'm pleased that you have looked again at the material I sent you. It is only a token of what is available, and I hope we shall have an opportunity to look at the facts (and where they lead) together.

Just one thing additional might be said at this time, and certainly not chidingly. You forget, perhaps, that I have had a remarkably long and varied experience in watching people at work in the lead trades. My interest in this problem arises only in part out of scientific curiosity. It is largely a matter of securing the answers to the significance of the stress of people who work. Some of the observations have been at second hand, especially during the last half of my medical career. Earlier I examined many men, as a person responsible for their safety. My experience and my own clinical observations of people whom I knew well, while following their exposure to lead and their lead output as closely as circumstances would permit (with the help of

very good technical people, analysts, engineers, etc.), will not allow me to weigh very heavily the contribution made to their difficulties (with lead) by the ordinary stresses that life brings to people generally. No, it is something much ~~more~~ specific, and even more subtle than this that converts essentially inert lead in the tissues, to chemically and toxicologically active lead. I have only one clue to it, and that gives me an hypothesis to pursue. (1) When an individual who is "leaded" is subjected, suddenly, to a considerable increase in his intake of lead, he is likely (statistically) to become intoxicated. This suggests that the binding of lead in the tissues (exclusive of the skeleton) reaches a level which can be exceeded readily when the incoming quantity is high. (2) When any group of persons is subjected abruptly to high dosage of lead (occupationally or otherwise), the incidence of an unusually acute form of the illness is extraordinarily high. This fits into the same situation as the individual in (1). (3) Nothing happens in response to an alcoholic bout, a general anaesthetic, an acute intoxication as in influenza, severe injury. I have seen all of these things (and others) occur, time after time, without any lead intoxication among employees near the threshold of danger. (4) I have never seen lead poisoning, at its onset, in any person, infant or adult, whose blood contained lead in a concentration below 0.80 micrograms $\pm$ 10 per cent per 100 grams. This means that the most susceptible (whatever that means) individual is endangered at this point, and that little is required (metabolically speaking, I would suppose), to tip the scales. The mechanism here, I strongly suspect, is the failure, on the part of the usual biochemical procedure, to bind the absorbed lead. I am not suggesting that many forms of stress are not potent in biochemical terms, but only that this seems to require a very specific type of stress. This is clearly indicated to me because of the remarkably stable character of the metabolism of lead. In our investigation of experimental subjects over the period of more than twenty years, in which some twenty persons have been followed day after day for periods ranging from four months to five years, the pattern has been practically invariable. This is nothing short of remarkable, and it is, in fact, the most important contribution made by our observations.

I do not hold, of course, that we can, or shall be able to, answer all of the questions, or even, for that matter, the most important questions, for our approach provides us with the descriptive pattern but not the mechanisms. The description, however, serves to eliminate a lot of hypotheses as to mechanism, and puts us in the way, sometime perhaps, to reveal mechanisms. For practical purposes, of course, it provides the basic background of diagnoses, for those who have the skill and experience to make the necessary observations.

I too hope to visit Boston in the not too distant future and to talk with you again.

Sincerely yours,

Robert A. Kehoe, M.D.

RAK:rms