

May 20, 1969

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Dear Doctor Chisolm:

I am glad to reply as well as I can to the questions in your letter of May 12. I shall take them up in the reverse order of their importance, as I see the situation, and then recommend the procedure which I would use in dealing with the problem of lead poisoning in urban slums.

First, with respect to the lead in the hair, I must say that I am not impressed by the value of the use of the hair as a material for analysis for the purpose of appraising the hazard to which an individual has been - or is being - subjected. It may be that extensive investigative work will establish quantitative relationships so as to permit the interpretation of such results. Several persons, some here in this Laboratory, are interested in the problem, but it seems very like that of the skin which aroused some interest some years ago and then subsided. There is the matter of the spatial distribution in the hair in relation to the time of the absorption; this is one fraught with considerable uncertainty. Then there is the relationship to the body burden; this is certainly more promising than the first, but the matter of potential external contamination seems to me to be an almost insurmountable obstacle. I do not know the answers, but in view of the availability of less dubious methods for accomplishing the desired purpose, I hardly think them worth obtaining. One of our Japanese colleagues, Kenzaburo Tsuchiya, M.D., of the Department of Preventive Medicine and Public Health, Keio University School of Medicine, Shinanomachi, Shinjuku-ku, Tokyo, Japan (associated with Susumu Harashima, who has returned home, after spending several months in this Department), has been much interested in this. It seems to me to follow the Japanese predilection for the multiplication of minutiae, but perhaps the product of these efforts may turn out to be highly useful.

Second, the significance of the chemical phenomena relating to the synthesis of hemoglobin came under consideration. A volume could be written on the subject. I'm sure I need not speak extensively about the significance of the porphyrins in this connection. From the aspect of a diagnostic first step in the individual case, the excess of Coproporphyrin III in the urine is, of course, useful, and as a screening procedure followed by analysis of the blood to check quantitatively the individual child whose porphyrinuria is suspiciously high, it would be acceptable.

The same is true, to a more efficient extent, of the finding of A.L.A. As you say, the information is not all in, but there is much evidence to indicate that quantitative determination of A.L.A. in the urine can put the finger on persons whose current (or recent) absorption of lead is abnormally high. I know little about this in children, but I am aware of the fairly high variability of the phenomena in adults, and I would expect it to be greater in children. The relationships of the quantities of A.L.A. in acceptable specimens of urine when analysed by a sufficiently precise method, have not been worked out to my

satisfaction, but even so, I would be prepared to accept the results obtained by competent hands as satisfactory for the purposes of screening. Again, however, I would wish to make use of analysis of the blood as the final answer.

Third, the only criterion which I am prepared to accept as indicative of the degree of danger (or of freedom from danger) associated with the absorption of unusual quantities of lead by a child who is not actually ill when examined, is the concentration of lead in the blood. It is just possible, now, that a method of analysis can be devised to apply to small volumes of whole blood, and I should consider this worthy of inquiry and, if feasible at all, worthy of careful development. In view of the carelessness amounting to flippancy in which methods of analysis are being applied to blood in all sorts of hands at present, I am very skeptical of the outcome of the dissemination of information about such a method. However, if the work is kept in the right kind of hands, and if responsible people will put out the full information for their responsible colleagues, it might be possible to keep the findings within proper bounds. Such information would have to include all of the details of the collection of the specimens, their preparation for analysis, and all of the analytical steps in detail. But analysts are like musicians - excellent, good, bad and awful, as well as inventive, without critique. The results are almost incredibly unreliable.

I shall discuss this with our analytical group in order to find out more about the methods now being considered, and I'll write you further. Perhaps, some sort of concerted action could be visualized and a procedure set up to develop a new method or a modification of an older method which would meet the needs of this situation. I'm afraid I have neglected the problem of the children in slum areas recently because our share of it here has diminished considerably, while I've been preoccupied with other problems. Recently, however, I've met a number of people who seem to have discovered the situation recently in other cities, and I gather that the awareness of it is more widespread than I had realized.

Incidentally, if any screening method is to be used, it too should be described in full detail, along with instructions for the collection, preservation (if necessary) and other ways of handling, specimens. The variability in the results from one individual to another, and from time to time (a.m. vs. p.m. for example) in the same individual, as well as the changes in specimens from their fresh state until some time later, is such as to be highly disconcerting. I suspect that the variability can be reduced considerably through the strict application of uniform procedures. Even so, I doubt very much that any such procedure can even yield the trustworthy results obtainable by proper sampling and analysis of the blood. Consequently, I believe that your insistence upon the further development of methods which can be applied to small specimens of blood is fully justified. I'll certainly do what I can to aid in this direction.

It is a pleasure to hear from you again. I have had a feeling of guilt for my failure to follow through on our correspondence of some time ago, and I am glad that you have not taken this as evidence of disinterest or discourtesy. The fact, which will probably surprise you little, is that I find myself so busy with current matters of one type or another (despite my alleged retirement), that my correspondence cannot be maintained.

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May 20, 1969

Incidentally, there is some talk about the possibility of an informal meeting of some people who are deeply interested in the medical problems associated with lead, at some time and place that would permit ample discussion and planning. This, I think, would be highly advantageous in a number of ways. We shall see what comes of it.

With kind regards,

Sincerely yours,

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

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