

March 9, 1941

Dr. R. M. Kurten
810 Main Street
Eacine, Wisconsin

Dear Doctor Kurten:

I have had the results of the analyses made on samples of urine and blood obtained from four men, for some days. I have been waiting to obtain the other samples and to complete the analyses before reporting the results to you. However, since they have not been received as yet, and since we will be delayed for a short time in our analytical program while the laboratory is being painted throughout, it seems wise to report the results to you. Accordingly I am sending you herewith the analytical results. A few words of interpretation are indicated in connection with these results.

Three of the blood analyses have given results which are definitely above the normal levels. The other one [REDACTED] is within normal limits. It would be interesting to know the detailed history of exposure of these men in relation to the analytical findings, and I should be glad to have this information at your early convenience. On the other hand, if we may assume that these samples were taken with the utmost precaution against contamination, we may accept the fact that three of these men have had some recent exposure to lead compounds. The blood levels are not necessarily dangerously high, and yet we have seen symptoms of intoxication occasionally in connection with blood levels of the order of magnitude of .07 milligrams per 100 grams. The blood is only slightly variable from hour to hour and from day to day under substantially uniform conditions of exposure. Therefore we may expect that these three men have had lead exposure of the same order of magnitude. On the other hand, the lead concentration in the blood does not change as promptly or to the same degree as that in the urine, so that minor differences in magnitude of exposure are not as well demonstrated by the blood as by the urine. Accordingly it is well to examine carefully the results obtained on the urine.

The variability of the analytical results on the urine is fairly considerable from hour to hour during the day, and from day to day, varying chiefly with the unit output of water. For this reason, small spot samples are

not as useful as large ones, unless they are taken under precise conditions with respect to time of day, water intake, etc. For these reasons we must regard the relatively high result obtained on [redacted] as inconclusive with respect to its evidence of lead exposure. In other words, this result, together with the results obtained on [redacted], [redacted] is just at the upper range of normal values or the lower range of abnormal values, whichever way one chooses to look at it. The latter two results are quite in keeping with the results obtained on the blood, and the relationship which obtains here between the blood and the urine are those which we usually find. I think, therefore, we can accept the fact that both of these men have had some recent lead exposure which is probably not of an essentially dangerous order of [redacted] tude. We may also accept the analytical evidence on [redacted] as indicating that he has had no recent significant exposure since, although the discrepancy between his blood and urine values is considerable, it is not beyond the range of common experience, and we may probably assume that [redacted] urine sample was a comparatively concentrated one.

This brings us to the consideration of the results obtained on [redacted]. These are distinctly unusual in that there is a very wide discrepancy between the results obtained on the blood and that obtained on the urine. I should feel reasonably certain that the high result on the urine was in part the result of contamination, except for the [redacted] that we have had a series of previous high results [redacted] that tend to indicate that this is his usual behavior with respect to lead excretion. The only situation in which we have found results of this type with any degree of consistency is when individuals have had a rather large exposure for a short period of time. Under these conditions the lead is lost from the body rapidly during the initial phase of the absorption, with the result that the blood does not develop a high concentration of lead, but the urine shows a disproportionately high concentration. I suspect, therefore, that [redacted] must have had a rather serious exposure within a period of twenty-four hours or so of the time in which these samples were taken. You will be able to judge that better than I, but this is an interesting phenomenon, and I feel that for the sake of your better information, it ought to be further investigated. Accordingly, if you are agreeable, I should like to suggest the collection of a series of urine samples on [redacted] before, during, and shortly after his day's work. If this meets with your approval, I will send you the necessary containers. I realize, of course, that this may not be possible for many reasons, and if it is impossible, the information concerning [redacted] day's work will enable you to see with reasonable certainty whether or not the interpretation which I have given of the results obtained on them is plausible and probably correct.

If the interpretation in the case of Putney is correct, then it is quite clear that the lead exposure occasioned by certain phases of his work is considerable and significant, and in that case steps should be taken to protect him against this exposure.

I shall look forward with a great deal of interest to any information which you supply me as to the details of the potential exposure of these several men in association with their day's

Very truly yours,

RAK:is

Robert A. Reese, M.D.