January 31,1941

Mr. Hoy A. Cranston
Laboratory of Polarographic Analysis
7002 South Halsted Street
Chicago, Illinois

Dear Mr. Cranston:

I have your letter of January 21st concerning the improvement made in your polarographic method of analysis, and your request for samples of urine.

Concerning the first of these, we have talked over the matter and are somewhat dubious of the adequacy of your method, particularly since recently we have had considerable experience ourselves in the use of the polarograph. The following comments may be made in this connection.

The use of a dithizone extraction is obviously an improvement, and this method is satisfactory when there is sufficient lead to be extracted; that is, when the concentration of lead in the solution to be polarized is at least of the order of magnitude of 1 microgram of lead per ml. This means, we believe, that large aliquots must be extracted, and that when small samples are to be used, the lead must be concentrated in some form. This introduces increased manipulation with its dangers of loss and contamination, and in addition we believe that there will be many samples which can not be concentrated far enough to provide for accurate analysis. We believe, therefore, that some other method of concentration will be required and for this purpose we have resorted to an electrolytic means, with very good results.

One other point in the procedure does not strike us as advisable. Ashing with sulphuric acid almost certainly introduces an additional quantity of lead into the sample, and although the quantity may be small and may not be recognizable as a blank, it does introduce some opportunity for error. Incidentally we are very much

in doubt of any such accuracy as one per cent in connection with these results.

As to our supplying you with samples. This will give us no problem if you are willing to make use of solutions of the ash of samples which we have prepared. We can easily supply you with aliquots corresponding to 100 ml of ordinary urine, putting these into your containers and sending them along to you in lots of 10 to 25. I should think that the examination of the first 50 of such samples would tell you how well the results check, and would enable you to decide whether to make some further modifications in your method, or to continue with the check analysis of a larger number. I would suggest, therefore, that you send us about 50 containers which we will make use of in supplying these aliquots. We should be very much interested in knowing the outcome of your results and we shall be very glad to cooperate with you in this way.

Cordially yours,

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Robert A. Kehoe, M.D.