

June 30, 1952

Dr. Myron H. Ball, Medical Director
Scranton Battery Corporation
Archbald, Pennsylvania

Dear Doctor Ball:

In connection with your problem of appraising the lead exposure of your battery workers, I can say, categorically, that if you wish to do this with precision you will be compelled to rely upon analytical determinations in the blood or urine (or in both of those) of the exposed persons. There are no other tests at present that will do this for you, although clinical methods plus other clinical laboratory procedures (hematologic or analysis of urine for coproporphyrins) will serve with reasonable satisfaction under certain circumstances. In the long run, because of medico-legal problems including compensation claims, the specific analytical procedures for lead, will be economically advantageous.

The methods of analyses that can be employed include spectrographic, polarographic and colorimetric (dithizone) but the complications of these are considerably greater than would appear by simply naming them, and if you are to do a good job of supervising this work and interpreting its results, you would be well advised, I think, to pay us a visit and examine the entire problem and its relationship to your own situation. If you wish to do this, I suggest any time after August 8th, since I shall be away during most of this period.

We do not recommend the polarographic method of analysis for lead as the one of choice, for a number of reasons. We have used it and have worked out certain problems connected with it, for our own purposes, but we do not use it regularly or even frequently, preferring a modification of the dithizone method which has stood the test of time and comprehensive use. We use a spectrographic method in parallel, and it is invaluable for our purposes, but is not recommended for clinical purposes, also for a number of reasons. The dithizone method calls for the use of a spectrometer, and thus, if you follow our advice, you will choose to purchase this instrument. The type purchased might well be considered in relation to other analytical work in which you may be interested now or later.

In addition to these matters there is the problem of the interpretation of analytical results, in which there are many pitfalls with

Dr. Myron H. Ball - (2) - June 30, 1952

which you should be familiar. Thus, I believe it would be to your advantage to visit us before you embark extensively on any program.

We shall be glad to assist you in any way we can, and to cross-check with you. I suggest that your analyst should be a well trained person with a good chemical background. His or her experience with a precise method could best be obtained by spending some time (say two weeks, but possibly more, dependent upon prior technical training) in this Laboratory. This can be arranged at no cost for the training.

If samples are to be crosschecked, a very careful technique will have to be arranged between us, since otherwise the samples will not be identical and will not check no matter what is done. For example, a sample of sufficient volume will have to be obtained to enable it to be split into two samples. A sample to be split must be fresh and utterly devoid of sediment or the splitting will permit unequal amounts of sediment in the two, with almost inevitably different quantities of lead, since the lead precipitates out in part with the phosphates. You can see, from this example, that the procedure is fraught with the possibility of serious errors at every point. Moreover, the presence of lead everywhere, and especially on the hands, skin and clothing of lead workers and on all the objects in their environment, make contamination of samples likely, so that the most meticulous precautions must be taken in the collection of every sample.

I doubt if you are ready for check analyses at present, since at best this is an expensive process. It costs us about \$10.00 for each individual analysis, and that is what we charge, since we cannot use money intended for experimental work to pay for work done for other purposes, and since also, as a laboratory in a university, we cannot do any work for profit.

If, on the basis of my remarks you wish us to assist you in certain specific matters, let me know and we shall be guided accordingly. One of my associates will take care of matters in my absence, if you choose to proceed before I return.

Cordially yours,

RAK:vr

Robert A. Kehoe, M.D.

cc - Mr. J. Cholak

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