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Gentlemen:

Having had requests from both of you for analytical methods for lead in biological materials, I forward such information in the form of reprints from the literature.

I gather from the statements in the two letters that your company has not applied analytical methods of control previously, and that neither of you has had experience in the use of the methods of analysis for lead in biological material. If this is true, I cannot warn you too strongly against attempts to put such methods to work, and especially against any efforts which may be required of you in the interpretation of such analytical results.

As to the analytical work, whether chemical or physical in type, the pitfalls involved in the frequency with which samples, equipment and chemicals are contaminated with lead are wholly beyond one's imagination, regardless of his technical proficiency, unless he has had experience. The techniques are highly exacting, and the environment of the laboratory in which one works must be made meticulously free of all foreign materials.

As to the type and quantities of samples to be obtained, and the methods of obtaining them, the problem is difficult and requires detailed knowledge of the sad experience of all who have gone before and learned in the hard way what not to do. In short this is no job for a novice. Specific training and experience are necessary to avoid serious mistakes and painful experiences.

The interpretation of the results of such analyses is essentially a medical job. Proper interpretation requires a background of physiological knowledge, and a consideration of the medical features of the general hygienic problem. You may suspect that in saying this I am attempting to protect the prestige of the physician, but such is not the case. I know from wide experience the difficulties that have arisen when non-medical people are asked to assume medical responsibilities in this very matter.

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Everything will be all right so long as the lead exposure which you are asked to measure is kept within safe limits, but if and when it is or becomes dangerous, you will be on the spot, and you will not be able to deal with the situation. For this reason, there must always be a coordinated effort between the analyst, who should assume no responsibility for the interpretation and application of the results, and the medical man, who only rarely has the knowledge and skill required to do the analyses. The physician should see to it that the right type and amount of sample is provided for analysis, while the analyst should see that the samples are obtained in such a manner (equipment, surroundings, containers, etc.) that they will not be contaminated. (No matter what you do, they will be contaminated occasionally, but unless you provide proper precautions they will be contaminated so regularly that your work will all be in vain.)

The articles being sent you will provide part of the help you need, but you will be able to save yourselves much time and untold grief, as well as no little expense, if you will pay us a visit and see at first hand the facilities, equipment and procedures that are necessary to obtain useful and reliable results. I would suggest that yourselves and a physician of your company might well visit us for a discussion of your problem, and that one or both of you plan to stay long enough to go through the steps of the procedures and to acquire a sound knowledge, not so much of the routine technique, although that will be valuable, but of the pitfalls that must be avoided if you are not to repeat all or most of the mistakes that others have made in arriving at sound procedures. May I also urge you to consider seriously what I have said about the medical part of this problem. If you are not to have the help and guidance of a physician in certain aspects of the program, it is highly questionable in my mind as to whether or not you should allow yourself to be drawn into it.

Very truly yours,

Robert A. Kehoe, M. D.

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- Enc. Quantitative Spectrographic Determination of Lead in Biological Material - Cholak
Determination of Lead in Biological Materials - Comparison of Spectrographic, Dithizone, and s-Diphenylcarbazine Methods - Cholak, Hubbard, McNary and Story
Spectrographic Analysis of Biological Material III. Lead, Tin, Aluminum, Copper and Silver - Cholak and Story
Determination of Lead in Biological Material - Cholak and Bambach
Electrolytic Deposition of Lead from Biological Material - Bambach and Cholak
Spectrochemical Determination of Trace Metals in Biological Material - Cholak and Story