

October 3, 1968

Dr. Vera Fiserova
Field Pool Apartments
1085 Douglas Road
Miami, Florida

Dear Doctor Fiserova:

Your letter of July 30 came while I was in the wilds of Montana on a fairly extended vacation, so that I am very tardy in answering it. I'm afraid, therefore, that any information I can give you will be too late to be of benefit during the period of your sojourn outside of the United States. Nevertheless, I shall try as well as I can to answer your questions, with information obtained from Mr. Cholak, head of the analytical staff of the Kettering Laboratory.

First, let me say that there have been no publications from the Kettering Laboratory on the determination of lead by the method of atomic absorption. There have been numerous publications from other sources, which I am sure you will be able to obtain in Miami.

The experience with the method here has been considerable but not decisive in certain respects which I shall mention.

The Perkin-Elmer Instrument #303 is in use, with "Intensitron" lead lamps. The latter have performed somewhat better than those used prior to six months ago. The method is not used, however, in the analysis of urine, blood or other tissues, since it is not sufficiently sensitive for direct use. (The report that we have been pleased with the results obtainable on the blood is entirely erroneous.) Such samples can be prepared for analysis by atomic absorption by a suitable method of extraction, but Mr. Cholak and his group have not gone in this direction for two reasons. First, we have a great deal of work on hand at present which should not be handled by any new method which has not been ^{tested} thoroughly, so as to establish its quantitative relationship to other methods for reproducibility and sensitivity. The work of past years with a "dithizone" method provides a basis for direct comparison with present findings - in environmental and population factors. We are not at liberty to alter these relationships without having a quantitative factor by which to standardize the results. We are following lead in the human environment in such a way as to detect changes. It would not be wise to change the analytical methodology until we had made parallel observations over the entire range of the expected findings, so as to be able to compare the methods quantitatively.

A procedure involving the direct ashing of certain types of samples in a "boat," is being investigated at present. It promises to be advantageous. In regular work, however, the use of the method of atomic absorption, as applied to lead, is being limited to determinations in air, water, soil and vegetation in which relatively high concentrations of lead and low quantities of ash are encountered.

Finally, let me say that at this point in time, so far as my information goes, I would not recommend the method of atomic absorption. I would stick to a soundly based and thoroughly tested dithizone procedure of known sensitivity and reproducibility. The method, in good hands, in dealing with biological specimens of the type and

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mass (or volume) employed generally, has an error of about 10 percent on either the high or low side, and a degree of reproducibility that is adequate. It is certainly good policy to seek better methods in terms of speed, simplicity and accuracy, but it is foolhardy for analysts who have not had, and made use of, the opportunity to test new procedures thoroughly to take up new methods because of the availability of new equipment or because someone has advocated their use without supplying the necessary information about them. Please do not suspect that I include you among the "foolhardy." I am speaking of the very considerable number of persons in industrial and diagnostic laboratories who lack experience and critical knowledge, and whose statements and efforts continue to bring confusion into industrial hygiene and medico-legal affairs.

I hope this letter reaches you without undue delay, and, more particularly, I hope you are busy and happy in your work.

Cordially,

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

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