

July 2, 1965

S. Colum Gilfillan, Ph.D.
1215 Ocean Avenue
Santa Monica, California 90401

Dear Doctor Gilfillan:

With respect to further analytical work, I can see no reason why Mr. Cholak should be unwilling to carry out further analyses for you, if and when you send in identifiable specimens for analysis.

The methods of analysis for lead which are being employed in the Laboratory (and have been since 1938, with certain minor improvements since that time) can be counted on to yield results of high precision. Members of the staff are now examining the method of atomic absorption which offers a great deal of promise, with respect to both sensitivity and precision. The spectrographic and "dithizone" methods are used in parallel, so that the one serves as a check on the other. The differences between the results so obtained are small, and it is evident that either of them can be used with high precision.

With respect to the upper limit of the findings in bones which are compatible with the absorption of lead during life, it is impossible to be dogmatic. However, anything above 3 mg. per 100 grams of bone is definitely abnormal, or perhaps I should say "unusual", as compared with the findings in Americans in this general period of time, while anything above 30 or, at most 40 mg. per 100 grams would be correspondingly unusual on the high side. You are quite right that a bone which had been high in lead at the time of death, might take up more after death; or it might owe much of that found in buried bones to experience during life. There is no present way of determining the source although it is possible that certain vagaries of the manner of distribution might reveal the facts on the basis of experiments with bits of skeleton. This has not been

Dr. Gilfillan (2) July 2, 1965

undertaken, so far as I know, so that there is no evidence on which to go.

With reference to the effects induced by the absorption of lead during life, insofar as these might be inferred by the findings in the skeleton after death, nothing of value can be said. There is no level of the concentration of lead in the skeleton that correlates with illness due to lead. One can make a good guess when good information is available from an autopsy. All one can say, otherwise, is that the analytical findings are compatible with illness, but not that illness actually existed. The severity of the illness cannot be inferred from analytical findings. The evidence of our work, here, is the best available in the literature on this subject. You must remember that there have been no reliable data on such matters until after the late 1920's, for the methods of analysis were not developed to the point of reasonable accuracy (in dealing with such small quantities of lead in biological material) before this time.

You had better give up entirely any idea that specific bones in the skeleton will reveal more information than certain others about the degree of exposure and absorption. Any bone (free of muscle, connective tissue and cartilage) will give you the approximate lead content of the skeleton. No one is better than the other, and the differences between them are always modest. It is true that the more vascular parts of the skeleton take up and retain more lead than the relatively avascular parts, during the period of rapid absorption, while the reverse is true during periods of very slow absorption (as in the course of ordinary life in the usual environment of the U.S.A.). Here, again, however, if the specimen of bone is of fair size, the differences are small and unimportant except for certain medico-legal considerations. There is no table of individual bones, and it is not likely that there will ever be such a table. It would be a time-consuming, costly and essentially fruitless task to obtain the data that would set up such a table.

I would be pleased to have the translations from the Russian to which you have referred. It is possible that we have them in our library, but the additional translations will be useful.

Dr. Gilfillan (3) July 2, 1965

Let me remind you that I shall be in the Laboratory for only a few days during the middle of August, after which I shall be in Santiago, Chile. Mail addressed to the Laboratory will reach me ultimately, but any information concerning specimens should be addressed to Mr. J. Cholak at the Laboratory.

With regards and best wishes for the success of your further efforts,

Cordially yours,

Robert A. Kehoe, M.D.

RAK:meh

P.S. With reference to publications on lead, I think you will be pleased to have a copy of the Harben Lectures which I gave in 1960, which also give a series of references to our own work. Other references are not included to any important extent, since the terms of this lectureship confine one almost entirely to original work.

RAK

Enclosure

KE 0002652