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January 29, 1980

Re: ER

H. A. Kornberg
Department of Energy
Bonneville Power Administration
P.O. Box 491
Vancouver, Washington 98666

Dear Mr. Kornberg:

I was well advised to warn you to write to me, since the discussion of the matter about which you have written to me can hardly be presented properly (and remembered) in a telephone call. The fact is that what I told you, in our conversation, is generally true but requires some understanding of a situation in which it seems to be in error.

Your question concerns only drinking water but an answer to that does not cover the situation because water is only one of the considerations. The fact is that everything which one takes, Water, food and air contain lead in both "normal" or "abnormal" amounts and therefore the question, so far as health is concerned, is, what is the total amount of lead consumed daily. As far as water is concerned the concentration which you mentioned, 0.05 mg per million, which is less useful than the usual expression, which relates to milligram per liter, is safe (as I stated) only when the quantity of lead in air, or especially in food, is within the usual "normal" levels. Lead is present in all natural foods. The quantity is usually low but when food is obtained from lead-containing soil in or near mines, it may be severely contaminated. The air, likewise, is generally free of dangerous concentrations of lead, but it may be seriously contaminated in or near lead using plants, (industry), or mines or undetected deposits. You see, therefore, that safety is never assured by adherence to a single standard. The question is - how much is the daily or periodic intake? This is what we have studied and this information is what I am engaged in presenting in a book which as yet is in the making.

Not to leave this entire matter up in the air at this point let me say that the "normal" figures for lead in water, food and air - and by "normal" is that which is usually the case in experimental people or those unemployed in the lead trades. This however is not always the case. For example, it is a common experience that people eat apples that have been sprayed with something, often lead compounds, without washing, wiping, or peeling. At the stem, and bud ends, these apples often contain significant amounts of lead. Then too the leaking of pipe joints often results in serious contamination of water with lead, particularly after standing idle for considerable periods, as in camps used only

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H. A. Kornberg

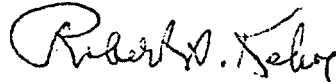
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January 29, 1980

occasionally. As to food, such things as shooting game or domestic animals results in the contamination of meat with lead. The spraying of various crops results similarly. Thus, you see, one can never be sure of the faultless behavior of people and so if we have to find out about a person - the Subjects for experiments for example - one must examine frequently the urine or the blood of an individual in order to know whether or not he is "normal". As a matter of fact, the situation is not that bad generally. However, if one is to set or to be guided by standards such standards must cover the total quantity of lead taken within the body at the time specified, for example per day, per week, per month etc. Thus you see this matter is not so simple as it may seem to the uninitiated. The literature of this subject is full of useless standards simply because no one until recently has actually studied the problem so as to understand it. We have come to recognize that we - mankind - are indulging in practices which alter significantly the human environment, its air, soil and water - sometimes dangerously.

Please forgive this lengthy substitution of a dissertation for a simple statement of fact. As you see, the latter, is often impossible.

Cordially,



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

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