September 12, 1968

S. Colum Gilfillan, Ph.D.
1301 Ocean Avenue
Santa Monica, California 90401

Dear Doctor Gilfillan:

I'm afraid the lapse in our correspondence has been my fault, unintentionally. Since my return from South America at the end of 1965, I've spent most of my time at the Kettering Laboratory, continuing some experimental work for the Laboratory, in which I've been engaged for many years, because there was no one to turn it over to. My wife and I have spent the periods of cold weather, elsewhere, and we shall find ourselves eventually, we hope, living in San Francisco.

I write at this time in a certain state of mental discomfort with respect to your estimation of the worth of the evidence which you have gathered in support of your main thesis. I dislike very much the role of a severe critic, especially of the conclusions of a man so clearly gentle and enthusiastic as yourself. But I think I must speak out frankly or be guilty of patronizing you. Since I do not like to be patronized and to be excused for failures in judgment on the basis that I am a nice, well-meaning but stupid fellow, I cannot bring myself to deal with you in this manner.

The fact is that you have no evidence, in the form of the analytical work that we have done, of the correctness of your thesis. Nor do you have any basis, in more than interesting and imaginative speculation, for the belief that lead played any part in the Roman debacle. Nothing would please me more than to be able to support your views, to accept your interpretations of the environmental conditions through which their intelligensia absorbed hygienically dangerous quantities of lead; to find even reasonably plausible clinical evidence of the high incidence of lead poisoning among them. Alas, however, there is nothing but the shimmer of pleasant moonshine to support these views. The toxic effects of lead which you describe are those that have descended to us from unskilled observers, and from utterly unsubstantiated (in the sense of proof) conclusions. The great French clinician, Tanquerel des Planches, whose critical study of clinical lead poisoning is the outstanding work of the early period, makes little or no mention of the things you emphasize. Modern medicine provides no support for your ideas.

Let me speak of some specific matters. You are very much concerned about the specific bone which might be most indicative of the truth about the absorption of lead by the individual. This is a very minor matter. There are appreciable differences between the part of any bone which has a rich circulation, and the part - the dense ivory of the shafts of the long bones, for example - which has little circulation. This problem has been investigated and we understand it fairly well. The fact is that the way to avoid important mistakes of calculation is to analyse a fairly large specimen of bone - a specimen that contains both dense and fenestrated bone. Almost any bone will do if it has both types of osseous tissue in its make-up. The error of the calculation, thereby, in terms of the entire skeleton, will be slight, insofar as the differentiation of large amounts of lead from small - which is all that is necessary to accomplish - is concerned. The so-called normal range of values is readily differentiated from the definitely abnormal range. Thus, the "normal" values in the U.S.A. range up to 3 or,

rhaps, 4 milligrams of lead per 100 grams of fresh bone, while values that result from unusual types of exposure to lead range up to more than 10 times these values. The analytical problem here is not to make use of a method of analysis that will apply to a minute piece of bone, but to depend upon having a sufficiently large specimen to be representative of the skeleton. The probe of which you speak is an ingenious device, but for this purpose it is almost useless. The further and much more serious problem is to obtain a specimen of bone that has had no opportunity to absorb lead after its circulation has been stopped or severed and after its removal from the body of its host. The problem in the case of your specimens is so difficult to solve, as to be virtually insoluble. No one, yet, has obtained bones for analyses of this type that can certainly be said to have escaped severe contamination. Consequently, the analytical results, while interesting, cannot be relied upon to reveal the exposure of the living person to lead. Should a buried bone have come in contact, by chance, with sea water, with moist soil, or with other lead-containing materials, it will have been contaminated. Moreover, granting the factor of time - years, centuries, millenia - the contamination will be of gross proportions, considering the predilection of bones for the absorption of lead.

If you would give your hypothesis the flavor of probability - not of certainty, but of probability - you will have to find skeletons or individual bones that have been so interred or so surrounded by lead-free materials which are clearly impervious to water, or are in an area or container from which water has been excluded in toto, since the death and desposition of the individuals involved, as to yield the assurance or the very high probability that they escaped contamination with lead. I repeat that this has not been done by you or anyone else, so far as I can determine. Thus, it is unimportant what methods of analyses have been applied to specimens of human bones, so long as they are sufficiently sensitive to deal with the quantities involved, as well as sufficiently reproducible to be reliable. The analytical techniques merely give the false flavor of importance and precision to results that are wholly untrustworth

It is my opinion, therefore, that your writings on this subject, so far as they lay claim to scientific precision, are highly misleading. It is better to describe what occurred to Roman society, insofar as it can be determined and documented, and to state the hypothesis as a reasonable one, without claiming that it has the support of scientific evidence, than it is to pile up spurious evidence on spurious evidence.

In this connection, the mimeographed paper of Stöfen on "Insidious Lead Poisoning" is a miscellaneous collection of misinformation, conjecture and speculation, mixed in with some few facts and a few seemingly plausible ideas. It is, in fact, a collection of garbage, so far as its medical and scientific backgrounds are concerned. I can trace the sources of most of the alleged statements of fact and their horrendous consequences. I've heard them over and over for the past decade. They are the mouthings of pseudo-scientists who have not the faintest idea of the nature of scientific evidence.

I beg of you not to be influenced by hearsay truths and speculative "evidence," lest you be made to appear foolish and irresponsible before your colleagues. Investigate much, if you can discover material worthy of examination; speak and write little and wisely, if you would be believed.

I trust that you will not be offended by what I have said in this letter, and also that you will not ascribe any motive to me, beyond that of giving the best advice to you of which I am capable.

Sincerely yours,

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

RAK:wp