

June 6, 1967

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Dear Pat:

I was pleased to receive your letter of May 17, with its enclosure of the data obtained from the investigation of the first twenty-six cadavers. Before commenting in any detail on the results, I think something should be said about the distribution of the subjects by age. As you will have noted, and as, of course, the facts of human survival decree, the extremes of age are fairly well represented in your series, while late adolescence and early and middle maturity are hardly to be found in the series. This will be difficult to mend, but it should be mended as far as possible, since what we are concerned with, in respect to the "normal" pattern is the period of active adult life. If conditions in your country resemble those here, the best source of such cases will be accidental deaths on your highways. I don't know that you will be enabled to get at them, but we would approach the matter here through the county coroner's office, otherwise known here as the medical examiner's office, in which deaths by violence come under official scrutiny.

Now for certain peculiarities of these data: I note that there are two cases involving adults in which relatively high values are found in the skeleton. One is your plumber code W.1. at 20.98 and 84.50 ppm for flat and long bone respectively. The gross discrepancy here indicates the long process of skeletal decrease in which the flat bone loses relatively rapidly and the long bone, much of which is dense, ivory-like, and relatively inert, retains the lead for a long time. The time interval here, since the lapse in the exposure, has been considerable. In the other instance, Code W.9., the two high results in the skeleton are much the same for flat and long bone, respectively, indicating in all probability that the same process as that above was underway but not so far advanced. This man was a sheet metal worker, who may have worked with considerable quantities of galvanized sheets which often come out of a zinc bath that is high in lead. In all events, the values in this case, while not extraordinarily high, are such as to indicate that this man had had appreciable exposure to lead in the latter years of his life, this having been incurred in all likelihood in the course of his occupation.

It is interesting to note that the relationship between the flat and long bone of stillborn, newborn and infants of early age tends to be the reverse of that of the adult. I should suppose that this results from the fact that the exposure to lead from the mother's blood has been relatively short, continuous and recent and that this phenomenon derives from the relative vascularity of the flat as compared to the long bones. It is an interesting fact.

Returning to the data obtained on adult skeletal tissues, one notes that fairly high values were found in the long bones of 9 of the 15 males (by high values I mean anything over 30 parts per million. The age distribution here (from the top

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of your list downward) is represented by the following series - 56, 60, 49, 74, 81, 66, 58, 38 and 82, while only one such result applies to flat bone (in the sheet metal worker). This I think means that these men had been subjected to somewhat unusual quantities of lead at some time in their lives, but that in only the one instance was this sustained until a relatively short time before death. Only two among the females, a 60 year old, urban housewife and shopkeeper, and a 75 year old, urban housewife, had fairly high values in the long bones. None of the females had unusually high values in the flat bone, although there was a considerable scattering of the values (i.e., from 0.7 to 22.6 ppm).

There are certain other features of the data that are of interest. There is, for example, a fairly strong correlation between the lead in the lung and that in the hilar lymphatics. This is not surprising, but, as I say, interesting.

I was impressed, at first, by three or four relatively high values in the prostate gland and by two relatively high results in the brain, but I can see no evidence in these data that any of the soft tissues shows any pronounced deviation from relationships observed previously. There have been suggestions from other sources, from time to time, of a selective absorption of lead in certain small organs, as for example, the suprarenal gland, the ovaries and the testes. I think these should be explored, if possible, but we have seen nothing in animal tissues to indicate any special predilections of this type.

We have been getting along very well, what with an early spring following a mild winter. We missed practically all of the winter by going to San Francisco for the first three months of 1967. There was no winter in Cincinnati up to January 1967, and after that, while I returned several times, I always had the good fortune to miss the snows and the unusually cold spells. We had a beautiful apartment (taken over fully supplied with everything from a lady who wanted to get away for three months), overlooking the bay on Russian Hill. It was one of the nicest interludes away from home that we have ever had. There was also a splendid alcove which I used as an office, where I was able to turn out quite a bit of work. San Francisco is altogether the most delightful city in the United States according to our views, and we look forward to repeating the experience next winter. Just what we shall be coming into in the next few weeks or months is a bit problematical. I hope fervently that the Egyptians get cooled down before the rest of the world explodes.

With best regards to yourself and family,

Sincerely yours,

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

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