

December 22, 1965

Mr. Vernon G. MacKenzie, Chief
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Washington, D.C. 20201

Dear Vernon:

I am inclined to be very unhappy about things which to me seem to be misunderstandings between people who are highly conscientious. One of the statements which you made to me at the Symposium on Lead has continued to disturb me, and I think I should comment on it and make a suggestion.

I have wondered on several occasions what was behind the view that some of the results obtained in the Three Cities Survey indicated there was a narrow margin between the levels of lead concentration in the blood of some persons in the general population and those indicative of potentially dangerous absorption of lead. (I am not attempting to quote the precise statements made in this regard but you will recognize the idea, I am sure.) When you referred, specifically, to the eleven relatively high values reported as the source of your concern, I recognized, for the first time, how this opinion could have come about. I think I must express my opinion of this matter, for I do not believe that, by any stretch of the imagination, this can be regarded as a valid basis for anxiety. (I think I need not argue with you as to the objectivity with which I consider such matters. Others may think as they will, but it has been my professional responsibility, for many years, to assemble the facts in this matter and to interpret them as unfavorably as possible in relation to any danger to the public health. Quite apart from my professional duty, I owe it to my long-term friends in Ethyl Corporation, to advise them properly in this manner, lest they follow a mistaken policy and come to grief.) There are a number of factors that enter into the pattern of the findings in a survey of the type that was reported in January 1965. Certainly, the general pattern in this instance was clear, but certain results which fell in the upper range

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can be regarded, statistically, as being well beyond the limits of the general universe under consideration, and more particularly beyond that represented by the specific group, such as postmen, for example, in which they occurred. If one merely inspects the frequencies, this is apparent. There is a gap that suggests, strongly, the intervention of another (or others) factor than that of the opportunities of the ordinary man for exposure to lead. We recognized this, years ago, in the case of garage mechanics, and were able to demonstrate the virtually unique situation of this group among other groups exposed occupationally to lead other than that of the exhausts of automobiles. It has been known for thirty years (J.I.H. & T. 13:42-68, 1936), during which cases of lead poisoning among garage mechanics have been rare and traceable to certain specific environmental factors which are uncommon in repair and maintenance garages. (I know that this is true, for I have had many sources of information which, while they have not covered all of the field, have covered much of it.) With respect to industrial workmen generally (aeronautical or other), the opportunities for exposure to lead are so common that they may be assumed to exist unless one has established the contrary facts by careful investigation. Moreover, the frequency with which persons, whose principal work involves no exposure to lead, engage in other work (at home or elsewhere) which provides opportunity for exposure to lead, is so high that no assumptions may be made. (I am not speaking here of theoretical "possibilities," but of facts demonstrated by experience. I may not have seen everything that can happen, but I've certainly seen many deviations from expected events.)

Beyond the factors referred to above are the errors of sampling and analysis. These are unusual, at this time, in our experience, but they still occur. A receptacle for a specimen of blood has not been chemically clean and free of lead; an analytical procedure has not been followed faithfully; a calculation has been made incorrectly. The fact is that these have been frequent enough to justify duplicate samples and duplicate analyses in all medico-legal cases in which we find ourselves involved. Should one, in such a situation, be greatly concerned about a few aberrant values? The critically scientific answer is, of course, that he should, for the exception to the rule may be the important item. The probabilities, however, are against this likelihood.

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With this idea in mind, I propose, quite beyond my reasonable interpretation of the insignificance of the high values in this survey, to find out the facts concerning the eleven exceptionally high findings. There are two parallel methods of doing this; namely, (1) further inquiry of the persons themselves or (if they have disappeared) of those who may know all about them; and (2) further investigation of their status with reference to the absorption of lead. I suggested that this should be done in the case of the man in the Los Angeles group whose blood yielded the value of 0.07 mg. per 100 grams of blood. This result is either in error, or it is evidence of some unusual exposure to lead. The four men in the rubric 0.06+ should also be investigated. Unfortunately, the further investigation of these persons was lost in the shuffle of the handling of the large mass of data in this Survey.

I have said, repeatedly, that the margin of safety between those in our population whom we have called "normal," and those who are exposed to demonstrable occupational hazard, is large. This, in my experience, is simply fact.

Sincerely yours,

Robert A. Kehoe, M.D.

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