

March 10, 1952

AIR MAIL

Dr. H. Buckup
Arbertsmedizinisches Institute
Arndtstrasse 19
Bochum, West Germany

Dear Doctor Buckup:

I find it difficult to give you any useful information in response to your letter of February 20, since the situation which you describe is entirely foreign to my experience.

My experience has never given me any reason to doubt that the frequency of occurrence and the degree of severity of lead poisoning among industrial workers is related directly to the severity of occupational exposure to lead compounds - that is, to the rate and extent of the absorption of lead. It is true, of course, that there is variation in the response of individuals in varying states of health and disease, but this has not been important in my experience, as a source of difficulty in the differentiation of safe from dangerous occupational conditions, or in the estimation of the severity of the occupational hazard.

You will recognize that I have had no experience with this problem under conditions of prolonged malnutrition in the industrial population, or under conditions involving significant and prolonged resort to unusual dietary regimens. Therefore, I cannot speak categorically or from experience. However, with this reservation of judgment, I must say that I cannot accept the likelihood that the dietary situation which you describe is responsible for an increase in the frequency of the occurrence of lead poisoning among industrial workers. It would be my considered opinion that if such cases are occurring with greater frequency, it is because they are absorbing greater quantities of lead. I feel quite sure, and I should have to have good evidence in proof of facts to the contrary, that a study of the patients will show lead concentrations in their blood, urine and tissues which are within a definitely dangerous range, and which, therefore, are fully compatible with what we know of the effects of the absorption of lead. I say this because we have studied a large number of persons in a very large segment of American industry, and we have not seen a single case of lead poisoning under conditions which involved any remarkable or unreasonable degree of susceptibility.

The study of the human metabolism of lead over the period of the last twenty years has shown it to be remarkably stabile. It is

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difficult, almost to the point of impossibility, to influence it materially by any type of dietary regimen, beyond that of varying the quantities of lead taken into the body. I have seen no evidence whatever that the rate of absorption of lead from the alimentary tract is influenced by diet, except under circumstances in which the emptying time of the tract is shortened or lengthened materially. Moreover, industrial lead poisoning, generally, although not without exception, is the result of respiratory absorption of lead, and not alimentary.

You raise the old question of the usefulness of milk. We have investigated the influence of varying quantities of milk on the absorption of lead from the alimentary tract and have found nothing that could be measured. There was no significant effect on the absorption or excretion of lead.

From the viewpoint of an investigator, I am interested in what you have told me, since it suggests that there may be some nutritional problem here that is worthy of investigation. Therefore, I would like to see your evidence that you are having a larger number of cases of poisoning without a corresponding increase in the occupational lead exposure. I strongly suspect that either the conditions are worse or the duration of exposure is longer. Either of these could make the difference.

On the other hand, from the aspect of industrial medicine and hygiene, I cannot avoid saying that when lead poisoning occurs in industry, the working conditions are unsafe. The remedy, therefore, must be found in the control of the exposure and the correction of dangerous occupational conditions, rather than in a resort to dietary or other medical panaceas. I have never been able to find any benefit of any significance in the use of prophylactic medicines, food supplements, or dietary regimens in relation to occupational lead poisoning. On the other hand, I have found that significant reduction of the exposure to lead by a number of means will bring about prompt and dramatic results. This can be done by cleaning up the sources of exposure, by shortening the working day, week, or total period of individual exposure, or by rotating men in and out of exposure at stated intervals, or at times indicated by the level of lead concentration in their blood and urine.

I may also make this additional remark. Unless you are following the lead absorption of your workmen indirectly by the determination of lead levels in the blood and/or urine with sufficient accuracy and frequency to disclose the facts in direct relation to their work, you cannot be sure of the significance of the exposure. Many things influence the extent of lead exposure in industrial plants from time to time. I suggest that you look carefully for the new and different sources of exposure that are responsible for the greater absorption of lead that has resulted in your increase in numbers of cases. My entire experience leads me to believe that if

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you look carefully for such sources, you will find them. Incidentally, I never believe anything anybody tells me about the type and extent of the lead exposure in a particular industry, unless he can provide me with wholly acceptable evidence. Otherwise I want to see for myself and then seek the evidence by analytical means (studying both air and men). I have learned by experience that nothing but valid evidence will suffice. I have probably had as much experience in the interpretation of conditions in the lead trades by inspection as anyone else, and yet I know that one can never trust such observations implicitly. Certainly if I cannot rely on my own opinions based on ordinary observation, I would not trust those of anyone else. Only quantitative methods can be used to measure industrial lead exposure and without these we must indulge in a mere guess as to the facts.

You will feel, perhaps, that I am being severe and highly skeptical in my comments on your letter. I trust that you will understand that there is nothing of unfriendly character in my words, but rather that they spring from a very sincere effort to put my views and experience at your disposal. I shall welcome the receipt of evidence that I am wrong in this instance, since I am ever ready to learn more than my experience has taught me thus far.

Sincerely yours,

Robert A. Kehoe, M. D.

RAK ef

P.S. Under separate cover, I am sending you reprints of some fairly recent articles which bear on some of the matters I have spoken of. Unfortunately a number of those I'd like to send are no longer available.

R.A.K.

Reprints under separate cover.

Experimental Studies on the Ingestion of Lead Compounds - Kehoe, Cholak, Hubbard, Bambach, McNary and Story
The Plasma-cell Partition of Blood Lead - Bambach, Kehoe and Logan
A Critical Appraisal of Current Practices in the Clinical Diagnosis of Lead Intoxication - Kehoe
Exposure to Lead - Kehoe
Influence of Dithiopropanol (BAL) on Human Lead Metabolism - Ryder, Cholak and Kehoe

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