

Copy of Mr. Ellis was sent to
Dr. Davis & he has attached it
to his report in Dr. Diller's files.

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December 11, 1959

A. R. Judd, M.D.
Price Battery Corporation
General Offices and Factories
Hamburg, PA.

Dear Doctor Judd:

I write hastily in response to your letter of December 8th, which Dr. Davis referred to me, for the reason that I shall be leaving town tomorrow to be gone until January 2nd. I shall try to answer your questions and to advise you as well as I can, briefly.

I think it is fair to say that the interpretation of Dr. Davis was made as it was on the assumption that you were familiar with the problem of lead absorption and with the general significance of the concentration of lead in the blood, if not with the details. I shall undertake to point out some of the more significant facts, but if these analyses are to continue, and to have any meaning, you will need to look into the literature that deals with these matters in a modern manner. I shall be glad to cite certain sources of information for your examination and study. I think, however, it would be advantageous if you were to pay us a visit some time in the near future so as to expedite the acquisition and the practical application of the necessary information. I shall return on January 1st, and would be glad to have you after that date.

Let me begin by pointing out the incorrectness of your view that there should be no lead in the blood in the normal healthy person. The fact is that all persons, including infants, have lead in their blood. The normal range extends from about 0.01 mg. to 0.05 mg. per 100 grams of whole blood, and the mean (or average) normal level found in the blood of normal persons is about 0.03 mg. per 100 grams. Mild degrees of exposure to lead result in elevation of the concentration in the blood, and so long as the concentration remains below 0.075 mg. per 100 grams, no lead intoxication occurs. At levels of 0.08 and above, symptoms of intoxication may appear (they do not always do so, however), and as the level advances to 0.10, 0.15, 0.20 and on up (as high as 0.60 or even 0.70,) the incidence of intoxication within an exposed group increases, and the severity of the intoxication also tends to increase.

The application of the techniques of industrial hygiene in industry must be good enough to maintain the blood levels of all employees below 0.08 mg. per 100 grams. If it is not this good, cases of poisoning will occur. This is not easy to do in a storage battery manufacturing plant, but it can be done. We are familiar with the operations in a number of such plants, and

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the principal problem of industrial hygiene lies in the control of the exposure. Rotation of the men can be used as additional means of preventing lead poisoning, but there are no rules of thumb that can be employed in doing this, nor is there any "standard procedure" for so doing. What you need to do, if you are to put reliance upon this procedure, is to follow your men with care, both by clinical and analytical means, and to remove them from dangerous exposure before they have absorbed a dangerous amount of lead.

Turning now to the results on your men for what they reveal, let me point out that two of the men listed are in immediate danger. Knerr is well over the border line of safety. He may develop symptoms of intoxication at any time. He should not be permitted to incur any further exposure until the concentration of lead in his blood has diminished and is within the normal range. It will do little good to transfer him to a job involving less exposure, for it takes but little additional absorption to maintain an elevated lead level.

Richert and Lenhart are only a little less in danger than is Knerr. Neither of these men has any remaining margin of safety. Either of them or both of them may develop comparatively mild symptoms at any time.

The other men are not in immediate danger but Kramer has very little margin of safety and Ortenzi and Sabaday have not far to go to reach levels of danger.

The fact is that these men have been working at dangerous industrial jobs. The conditions under which they are working need correction by whatever means that may be required. This should be looked into and attended to promptly.

I have indicated how the men should be handled, but I repeat that Knerr should be removed from work involving exposure to lead without delay. The urgency in Lenhart's case is not so great, but he is in danger and his exposure should be reduced greatly without any delay.

Cordially yours,

Robert A. Kehoe, M. D.

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Dictated but not read

cc: Dr. Alvin Davis