Lead Industries Association

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DIRECTOR OF HEALTH AND SAFETY

August 3, 1956

Robert A. Kehoe, M. D.
Director, Kettering Laboratory
University of Cincinnati
Eden Avenue
Cincinnati 19, Ohio

Dear Bob:

I greatly appreciate your sending me a copy of your letter to Dr. George. It strikes me as so admirable and so important that I have sent a copy to Drew Fletcher, both for his own interest and with the thought that he will probably forward it to Mr. L. B. Robinson, Vice-Chairman of the Zinc Corporation in London, the case about which Dr. George wrote you having been an employee of theirs in Australia. Drew and Robinson have been in correspondence about this matter; as you may or may not know, Drew's daughter Ann is married to Robinson Junior.

I regret to say that, in a letter which George wrote me in June, after his return, he indicated that the Zinc Corporation would probably settle the case, "rather than draw attention to the new problem" by contesting it, and this is confirmed in a letter which came from him only today. He feels sure, however, that something will ultimately be done about it, and promises to keep me informed.

I shall respond to your no less excellent Giesselian communication by separate letter.

And the same with regard to your acknowledgment of my "left-handed remarks" anent the case of "Arsenic and Old Luce," as some wit has labeled it, which I am glad to know disturbed you no more than I thought it would.

Sincerely,

MB:GW

LEAD INDUSTRIES RELY ON LEAD

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AIR MAIL

July 30, 1956

Dr. W. E. George
N.Z.L. Building
42 Bridge Street
Sydney, New South Wales
Australia

Dear Doctor George:

At the time I received your letter and also since, I have been pressed for time to such an extent that everything that could be allowed to wait has done so, my correspondence being mainly in that category. I trust that my failure to reply promptly to your letter has not inconvenienced you or led you to think me indifferent or somewhat less than courteous.

The problem which you present is one that was bound to develop out of the misunderstandings that exist in the minds of many laymen and even among physicians, concerning certain aspects of the behavior of lead. Since the last word on the latter is not in, with particular regard to the precise mechanism or mechanisms of the intra- or inter-cellular effects exerted by lead, it is difficult to deal with the problem without appearing to be opinionated beyond the evidence. Even so, I cannot feel that we should accept opinions based upon naiveté, in preference to those that have developed out of experience and a critical examination of available facts. Therefore, I express my own opinions freely.

The evidence, as I see it, indicates clearly that the absorption of lead, within the limits of a certain range, is entirely without threat of harm to man and living things generally, so far as we know the facts in their broad application. This follows from the fact that lead is in the food which springs from the soil of this earth, being, and apparently having always been, in everything that we eat and drink and in the air we breathe. This range is somewhat variable from individual to individual, and from area to area, dependent upon a multitude of natural and artificial environmental factors, but so far as observations have gone - and they have been extended far in the last quarter of a century - the entire situation can be expressed in the physiological terms of the ranges of lead concentration in the tissues of the bodies, the body fluids and the excreta, of essentially normal persons - i.e., those not suffering from the more or less obvious diseases that impair, significantly, health and the capacity for the performance of the ordinary tasks and duties of life. These ranges have been described in the literature and need not be detailed here.

It has also been shown, in my opinion beyond any reasonable doubt, that

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considerably more than the "normal" range of lead concentration in the body induces no harm in any anatomical or functional way that we can now detect.

At certain critical levels of concentration, as measured directly or indirectly - by the analysis of the tissues directly, or by reasonable extrapolations based on analysis of body fluids and excretions - the likelihood of harm is demonstrated by an increasing incidence and severity of symptoms and signs of illness.

On this background, which has been portrayed elaborately by intensive and extensive clinical and physiological investigations, we now turn to the effects of certain agents, of which only BAL and EDTA, so far as we now know, are of any real significance. These, when administered in appropriate amounts, change markedly the pattern of lead distribution in the body by inducing a rapid loss of lead from the soft tissues. After this has occurred, the normal bodily metabolism gradually restores the equilibrium throughout the body between the skeleton and the soft tissues. The total effect, speaking in metabolic terms, is that some lead, in excess of that which would have been lost by normal means, has been eliminated from the body.

It is evident that the administration of either BAL or EDTA to any individual from the lowest normal to the highest abnormal (in terms of lead concentration in the tissues, fluids and excreta) can be expected to increase the elimination of lead from the soft tissues of the body (BAL gives this response more quickly, but less consistently, from the quantitative aspect, than does EDTA). There are a number of factors, only a few of which are known in any definitive manner, that influence the degree of response to these agents. Certainly the quantity of lead available in the soft tissues is one of these factors, but it is not possible, at present, to gauge, with any real precision, the amount of lead available in the tissues, by the quantitative degree of the response to the administration of a certain dose of EDTA over a certain period of time and in a particular manner. All we can do is to generalize by saying that if the response is great, the quantities of lead must be considerable. Detailed metabolic investigations, which have not been carried out (we carried out several brief experiments with BAL and one with EDTA, but I know of no others that have followed the total intake and output of lead by men), would be required to establish the relationships on any sound physiological or even statistical basis.

We have learned from one series of observations on a single laboratory subject with a fairly well defined and essentially normal body burden (total content of body) of lead, that the response to the administration of EDTA by mouth can give rise to a prompt and appreciable loss of lead from the body (increase in urinary lead output without any demonstrable decrease in the lead output in the feces). When the opportunity presents itself in a professional situation that will justify such experiments, we hope to investigate a series of individuals with considerably elevated and known - that is approximately known - body burdens of lead, so as to establish standard conditions and valid criteria for the interpretation

of the significance of the response to EDTA. This would be the only means I can think of whereby your problem will be answered satisfactorily. Meanwhile, I am convinced, despite all of the difficulties of the situation, founded on the serious and common bias associated with the age-old belief in the horrible and irreversible effects of lead poisoning, that the type of reasoning - or lack of reasoning - that has given rise to your problem ought to be combatted vigorously in medico-legal circles, to the end that its proponents may be compelled to adduce some valid evidence in support of their views or else be made to appear ridiculous.

I know what you are up against in your part of the world in dissociating the degenerative diseases, particularly the renal-vascular group, from lead as a causative factor. The same problem exists, in lesser degree and in certain more or less limited areas, in this country. The work and writings of men like Nye have convinced a very large proportion of your physicians of the reasonableness - nay the certainty - of this relationship. It was virtually a classical doctrine in clinical medicine long before Nye. I am quite convinced, from the epidemiological, physiological and clinical work which I and my associates have done within certain groups over a period of thirty years, that the idea was wrong in its inception and that it is a magnificent example of post hoc medical reasoning. I am also reasonably certain that the idea can be shown to be false, when the evidence of industry can be assembled on a sufficiently wide base. Even after that, however, a long time will elapse before the non-industrial clinicians will absorb the facts and accept them. How long, Oh Lord, how long, does a deeply rooted idea persist!

I fear that what I have said will not be of much help to you, but such as it is I offer it to you. As to the opinion of "the experts" in this country on the relationship of lead to the degenerative diseases, the best I can do is to send you, under separate cover, a document of the position, in the form of a report of the American Public Health Association. This is as nearly "official" as the situation can be made in the U.S.A. I refer you specifically to page 56 of this Report, in which this problem is discussed. This is the considered opinion of the group of experienced observers of this problem in this country. It proves nothing, but for the purposes of court action, it digs the ground out from under those who consider that the matter has been decided in general medical opinion. This fact is, on the contrary, that this whole concept has been handed down from textbook and medical article to textbook and medical article, over such a length of years that almost no one in modern times has bothered to look at the original source of the opinion. It has become an "article of faith," as a revelation from the ancestors of the modern breed of physicians.

If there is some real assistance which I can offer you, please do not hesitate to let me know.

Sincerely yours,

RAK:vr

Robert A. Kehoe, M.D.

cc - Dr. Manfred Bowditch