

January 14, 1946

PERSONAL AND CONFIDENTIAL

Mr. J. H. Schaefer,
Ethyl Corporation,
Chrysler Building,
New York City 17.

Dear John:

I have noted the material from the Lead Industries Association forwarded with your note of January 2 and am returning this material herewith. I have a few comments to make which are for your own information and use, and which for a number of reasons I should prefer you did not transmit to Felix Wormser as coming from me. He may assume that they have come from me if they are mentioned to him, and although that is not a matter of great importance I should prefer that you deal as diplomatically as possible with comments that I am making, since I do not want to be misunderstood, especially in relation to the attitude of this Laboratory on certain phases of an experimental program on industrial lead exposure and poisoning.

There is one respect in which these discussions, which continue to come from Wormser, are a source of some irritation to me. I have never been able to understand why Lead Industries Association through Wormser had not interested themselves directly and financially in the work of this Laboratory. It appears that they have money to invest in experimental work, inasmuch as they appear to be considering favorably the project at Johns Hopkins. Obviously I am interested in investigative work on this subject anywhere it can be done, but in the present state of information about what is being done and what is proposed at Hopkins this looks a good deal like wildcatting. If Lead Industries Association has this much money to spend on a project of this sort, one would suspect that they might be interested in investing something in experimental work thus far prosecuted to the advantage of the entire lead industry, wholly at the expense of Ethyl Corporation. This may sound like professional pique and it would be so interpreted by Wormser I believe, and therefore I speak only to you; but to continue the discussion, Lead Industries Association is apparently willing and anxious to continue their investigations at Harvard University. Now Felix and Joe Aub and some others would not like me any better for saying so, but the money they have thus far invested at Harvard has gone down a rat hole. Practically the entire work of this group has been demonstrated to be inaccurate, the fundamental conclusions have been shown to be unsound, and actually the work introduced confusion rather than

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clarity in an important matter. This is harsh criticism, and it is apparent that Aub and his associates are not to be criticized too severely for errors in method and procedure, at a time when both method and procedure had to take an uncharted course. The fact of the matter is, however, that the work resulted substantially in incorrect conclusions and in unsound theories. For some reason or other nobody is willing to face these facts. However, let me make a few specific points. Fairhall, associated with Aub, developed an analytical method which was an advance over anything available at that time, but which turned out to be completely inadequate for the investigation of the problems involved. Therefore the demonstration of a number of important facts had to wait until new and satisfactory methods could be developed.

Second, on the factual basis, this experimental group said categorically that there was no normal or incidental lead exposure on the part of individuals outside the lead trades. The failure to recognize that this was not true was responsible for misleading much of the other subsequent work, resulting in false conclusions. Some years later we were able to demonstrate not only the existence of normal lead absorption and excretion but the sources thereof and the magnitude of the quantities involved.

Third, Aub and his associates established for their own satisfaction that lead was stored in substantially inert form in the skeleton as the result of some pre-existing accidental or occupational lead exposure. We have demonstrated subsequently beyond any question that lead which they were dealing with in the skeleton was to a large extent the normal incidental lead absorbed into the tissues and held in substantial equilibrium there by virtue of the regular daily intake and absorption of regular unavoidable quantities of lead in the food and drink of normal individuals.

Fourth, they were unable to measure adequately the urinary lead excretion, and by reason of their failure to recognize the quantities and the source of lead in the feces they interpreted the alimentary lead output as actual excreted lead. This fact served to confuse the issue when they began to study the demobilization of lead, and they arrived at the false conclusion that lead could be demobilized from the body by suitable therapeutic means. We have demonstrated quite conclusively the error of these conclusions. Moreover we have shown what was never previously known or recognized, that lead excretion in the urine is closely related quantitatively to the rate of current lead absorption and that the rate of urinary lead excretion could be used as the measure of lead exposure in industry as well as the lead absorbed under conditions of exposure from any source. This opened up the whole field for the adequate measurement of industrial lead exposure, and clarified certain features in the diagnosis of lead poisoning, which had only been confused by the Harvard work.

In this connection, if Wormser has any doubt about where this present

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approach to this problem originated, one might ask him the following:

1. What work established the relationship of urinary and blood lead concentrations to lead absorption and, therefore, provided the modern diagnostic tools?
2. Who devised the methods whereby this was accomplished?
3. Who established the facts on the basis of which occupational lead exposure is now capable of being estimated with reference to its significance?
4. Who established the quantities and the sources of the normal lead exposure in the modern community?

The answer to these questions would be interesting, and I should like to be outside in a corner if these could be asked Wormser as a basis for establishing an opinion as to whether their investments at Harvard over the period of the last twenty years had not been substantially a waste of money. No one of the important facts on which the modern concept of lead absorption and lead poisoning is based have come out of those investments. One would suspect that a man as intelligent as Wormser might wake up to this fact. Or perhaps he thinks he is purchasing prestige from Harvard University for his Association. Now I like Felix very much and I have respect for his honesty and capability in a number of matters, but I cannot understand to save my soul whether this performance is just stupidity or whether it is something else. In the meantime while Lead Industries Association has been conducting itself rather inadequately, Ethyl Corporation has spent something like a half million dollars obtaining facts which have benefitted the entire industry, but toward which no other part of the industry has contributed a penny. This is not strictly true, but is so nearly true that it can be accepted as substantially a fact. I cannot but feel, therefore, that you as a responsible official of Ethyl Corporation might properly ask why you should contribute to further investigations that have hitherto been unfruitful.

In this connection with reference to the Hopkins project, no one knows better than I that attempts to procure an antidote for lead poisoning will be of consequence medically speaking. However, from the point of view of industry this is not very important. The job of industry is to prevent lead poisoning, not to treat it. The methods of prevention are reasonably clear, but they can be improved. Improvement, however, in my opinion, will depend upon a more fundamental understanding of the behavior of lead when absorbed under varying conditions of occupational exposure. This is the problem we have been studying systematically for many years, not because we are not tempted by such problems as that with which the people at Hopkins are concerned, but rather because we believe firmly that the information of which we are in search is of much greater importance in

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the solution of the problems of industry. During the next several years we are planning to undertake a comprehensive investigation of the fate of particulate lead as dust and fume when inhaled regularly over a long period of time. This will be costly work and it will take years to obtain anything like a satisfactory answer. This information is needed by Ethyl Corporation in connection with its responsibilities to its employees and to the public. However, these responsibilities are identical with those of the lead trades in general, and therefore this work should not have to be paid for exclusively by Ethyl Corporation but should be supported by the lead industries. It is not clear to me why Wormser would need to be told this. It seems so utterly obvious as to require no comment. This is the only laboratory in the world that is equipped to do this job. That this is the case is not due to me or the staff of the Laboratory primarily. But is due to the generosity and foresight of Ethyl Corporation, but why, I wonder, should Ethyl Corporation have to supply the foresight as well as the money for the entire lead industry?

Obviously you can say as much or as little as you like about what I have said in the foregoing paragraphs. I have simply let down my back hair and have talked to you as a friend as I would not think of speaking professionally to any group or individual. I am merely presenting a point of view, which is said neither tactfully nor wholly sympathetically perhaps. However, I believe what I have said is the straight truth without any personal or professional bias. Insofar as you care to use it as a guide for your own thought and action you are welcome to it. If you prefer not to say anything about it, or if you do not agree with it in toto, ignore it completely. In any case, this is written to you in confidence, and I would not want it to be quoted in whole or in part.

Finally, with reference to the policy of Lead Industries I would advise against a campaign of propaganda directed from official sources, not because it would not have facts on which to go but rather because it will inevitably be regarded as prejudiced to some degree. The clarification of the situation about which Felix is complaining will come about only through published scientific work presented to people who are capable of criticizing it, through the normal dignified scientific channels. I agree that Lead Industries Association is entitled to a great respect. It will have this respect in limited informed circles. However, in these days of advertising ballyhoo, and propaganda in the worst acquired meaning of that term, the public in general will regard the publication and speech of Lead Industries Association along these lines, in somewhat the same light that they consider Soap Operas and radio advertising in general. This is unfortunate, but it is inevitable and in these times unavoidable.

Sincerely yours,

Robert A. Kehoe, M. D.