June 21, 1956

Dr. Thomas F. Mancuso
Chief, Division of Industrial Hygiene
Department of Health
State of Ohio
306 Ohio Departments Building
Columbus 15, Ohio

Dear Mancuso:

I am pleased that you wrote to me about your proposed method of handling the medical problems of lead poisoning as it confronts your Department. As you may suspect, it is also a serious problem for us, and for me in particular, since I handle this bit of the work of the Laboratory in all matters except that of the actual analytical performance. It is a difficult problem, involving quite a lot of time in correspondence and in giving advice. Part of the trouble stems from the manner in which various people present their problems to us, and this trouble, I fear, will be greatly augmented by such reference to the Laboratory as you have thought of making. Therefore, I am glad to offer a few suggestions on this point, and I also make a few technical criticisms which seem to me to be valid.

It occurs to me to point out to you, if you are not aware of it, that we act in a capacity similar to that of your Department and its laboratory facilities within the City of Cincinnati, in that we do the technical environmental investigations, at the request of the Bureau of Industrial Hygiene of the Health Department of the City and in collaboration with their medical services, under an agreement between the Department and the Board of Directors of the University. We know what your problems are, therefore. Moreover, we consult with industrial organizations in these matters at their request, in Ohio and elsewhere. There is no end of the amount of work that can be done, and we too must limit it in a number of ways. We respond most enthusiastically to requests for advice and service in establishing adequate measures of medical and hygienic control, and in this way we save ourselves and your Department from many further headaches.

I turn now to "A Note About Occupational Diseases." I have gone over this carefully and have written in, in pencil notations, the changes which

I would make. You may or may not accept them, but I am taking the trouble to discuss those which seem to me to require explanation. I hope you can read my notations. I am not having the whole thing retyped, since I don't wish to formalize my recommendations. They are made to you personally, to take or to leave. I prefer to criticize your statements privately rather than publicly. I do want you to realize, however, that my criticisms are not hastily or lightly made. Rather they are as I would make them publicly or for publication, except for the fact that I have not attempted to add to your statements but only to edit them.

My first change is on page 1, where, aside from a few modifications of verbiage, I have made only one important change. The use of "toxicity" in the sense employed, is, I think, confusing. I object, and have continued consistently to do so, to the coupling of non-toxicity (or low toxicity) with failure of absorption. It is a semantic problem, of course, but unfortunately it is a source of great confusion to laymen and to some of the medical brethren who are not very well informed in matters of physiology.

On page 2 there are many changes. I shall dispose of the minor changes briefly. Under 2, the term "private" is not well chosen. This Laboratory is as "public" as any. The other changes in this first paragraph are merely matters of choice.

The rewriting of the middle paragraph is primarily an attempt to extricate this Laboratory from difficulties, secondarily to keep the name of the Laboratory straight. There is no Kettering Institute. The Kettering Laboratory, which originated in the Department of Physiology, is the central unit of this Department, as indicated on our letterhead. The Institute of Industrial Health, on the contrary, is a functional organization in the Graduate School of Arts and Sciences in the University of Cincinnati for the purposes of graduate instruction. It is not surprising that there is some misunderstanding of this situation, but it is important to have the names right in public print.

As to the restatement of the position of the Kettering Laboratory, let me be frank in saying that you may refer to it or not as you choose, but you should not tell anyone that we will carry out analyses for them. This is not an analytical or service organization. We will help physicians toward a diagnosis if they consult us, since that is a professional duty. We will aid industrial management, under appropriate circumstances, in the hope of helping them find some solution of their medical problems, through obtaining, as a first step, competent medical service. We will not analyse any samples of urine or blood or of anything else sent to us without prearrangement. We will instruct people how to obtain suitable samples, we will provide containers for such samples, and in exchange for adequate medical information, we will carry out the analyses which we choose to do if we are

reimbursed for the actual cost of the work. (If patients or workmen cannot afford the cost of the work, we absorb it, within certain limits which do not increase our overhead expense excessively. In this way we do thousands of dollars worth of charitable work annually, as a physician (or in this instance, a public medical institution which is conducted according to private medical ethics) must be prepared to do.) I expect physicians who come to us for this help to come to me (by telephone or mail) with their problem, and to let me advise them how to deal with it. This saves an enormous amount of time and eliminates a world of confusion.

I have made significant changes in your section on Lead Poisoning. All of these, in my opinion, are useful, but some are more important than others. I can vouch for the correctness of the technical changes. To discuss these hastily let me point out:

1. that solubility is not always or necessarily a matter of particle size. Thus I have modified your statement on this point.

2. that lead compounds, generally, are not absorbed through the skin; the only compound of lead that is used in industry that is absorbed appreciably through the skin is tetraethyl lead, and it is not so absorbed if it is sufficiently diluted in gasoline or other suitable solvent;

3. the minor changes I have suggested in the paragraph Symptoms are somewhat more precise than the original statements;

4. under Diagnosis, I have made several very necessary changes in statements of fact; the use of the word "storage" of lead or of the phrase "lead stored in the body" is often misinterpreted; it is better to speak of lead as having been absorbed or as being present in the body, for there is then no implication of anything obscure; the physiology of the lead metabolism has been confused enough, for a long enough time; it is wise and necessary to talk in simple and fully understood terms;

5. In this same section, the following points must be set straight;

   (a) the range of normal urinary values for samples of small volume (which are commonly dealt with in these days) is as I have indicated; the range which you cited relates only to samples of large volume - 2 to 3 liters;

   (b) excessive "storage" i.e. absorption - of lead cannot possibly occur without elevation of the lead concentration in the blood except when the material absorbed is tetraethyl lead; the equilibrium with the blood is as inevitable as is the presence of inorganic lead in the body (you hardly need worry about tetraethyl lead, since this type of poisoning is almost never seen by physicians generally);

(c) the resort to the use of EDTA to release lead has no diagnostic significance (I know full well that Brieger has put out some information on this, but he was and is most incautious in doing so); if the lead in the blood is not elevated above the mean normal level at a time when no therapy with EDTA has been resorted to, there is no unusual or hygienically significant quantity of lead in the body; it is for this reason that I have deleted your two sentences; I have added the dangerous levels of urinary and blood concentration; it seems unlikely that anyone would quarrel with the evidence behind these figures.

(d) I have made changes in the statement about "stippling" and the porphyrins. The importance of the latter is considerable for diagnostic purposes but practically zero from the aspect of the detection of dangerous absorption of lead before any form of intoxication occurs; a significant increase in coproporphyrinuria is, I believe, a sign of intoxication; your statement that the prophyrins occur in high concentration in association with lead absorption, as such, therefore is not exactly true.

6. Under Therapy I have made few but significant changes. The resort to "deleading" as such should not be emphasized. If EDTA is to remain with us as an important agent for therapy, it will be because of its relief of illness, not because of the deleading per se. The latter is rarely important, for it occurs spontaneously and there is rarely any good reason for hastening it. As a chelating agent, it removes lead ions from further action and allows the soft tissues to be freed of their lead quickly. It affects that in the skeleton only secondarily, i.e. by disturbing the equilibrium between the skeleton and the soft tissues with their greater and more uniformly distributed circulation. This may not be the whole story, or the altogether correct story of the action of EDTA, but that is the way it looks at this time. The extent of the clinical relief of symptoms is still to be determined.

7. (a) Under prevention, statement 1, you have neglected to mention and to emphasize measures of medical control. The application of engineering measures in the first instance is manifestly essential, but that is not the whole story. Keeping everything in shape in the environment is as much a function of medical as of engineering control. This needs to be stated, restated and insisted upon. The sad state of our lead trades in Ohio and in the country generally is essentially the result of bad or absent medical practice in industry.

(b) I have revised your statement 2 to put emphasis on the only means by which personal hygiene can be promoted.

(c) Statement 3 is made in accordance with techniques which are common but actually are obsolete. The periodicity of the medical procedures should not be specified by law or regulation or in any other general way. They depend entirely upon the degree of hazard. I know numbers of industries in which a check-up of the men at intervals of three, six or even twelve months is entirely adequate. I know others in which monthly examinations are insufficient. It is simply not realistic to talk about the periodicity or even the nature of the examinations in a general way. What we need is good intellegent medical guidance of the people in the lead trades. There is no point in deceiving ourselves on this matter. Therefore, we must not miss any opportunity to point out this essential need. We in Ohio are decades behind in this matter, with the exception of a few industrial organizations whose hygienic activities are under the direction of really competent physicians. As an illustration of the problem which we face, this Department has given two courses of a Seminar or Symposium type, in which we have covered the entire problem of the hygienic control in the lead trades, as well as the full medical and clinical aspects of the problem. Industrial physicians have come from all over the U.S.A. and some have come from abroad, but practically none of the Ohio physicians - even those in Cincinnati - have come. Why? By and large, our Ohio physicians, with a few notable exceptions, do not even know that there is anything for them to learn. And why is that ? In general medical circles in Ohio, we don't even know that industry - all industry - needs a brand of occupational medicine that is significantly different from that represented by the treatment of injury and disease. I am not complaining, for I have lived in Ohio all my life. I know the people and I know medical practice here in a broad way. We shall succeed in changing this situation. But we shall not do it by accepting the old ways of doing things. For that reason the material from your office should, so far as possible, move toward the new era in which occupational medicine in this state will be practiced by men who know something about it. The practitioner can learn all he needs to know about lead poisoning and many other industrial problems, if he is shown that there is something to know which he does not know. That is why I have put as much of this memorandum as possible in the terms of modern medical techniques. From the aspect of medical information we know how to eliminate lead poisoning, utterly, from Ohio industry. That this is not being done is sufficient evidence of the backwardness of medical practice in industry in this state and nation.

Turning now to your references I have made only two suggestions, aside from the correction of the spelling of Brieger's name. I advise you to avoid any even implied recommendation of the book by Sax. It is full of errors of fact and judgment, of misstatements and incomplete statements. He should not have attempted such a work, and it would have been better for everyone if he had not.

On the other hand, I am sorry that the APHA report to which I have referred is not cited by everyone who wishes to bring some understanding of this problem to English-speaking physicians. For some reason the report has not had a wide distribution. It will have to be revised, one of these days, in the matter of therapy, but if the physicians of this State were to study it, our difficulties would be lessened.

I have taken a great deal more time than I could afford to write on this matter, and there is still much to say. I hope I have contributed something that will be useful.

With kindest regards,

Sincerely yours,

Robert A. Kehoe, M. D.

RAK ef

Enc.

P.S. I send you herewith for such use as they may be to you if you do not have them, two publication of the APHA in which we have had some hand.

R.A.K.

Occupational Lead Exposure and Lead Poisoning - APHA
Methods for Determining Lead in Air and in Biological Materials - APHA

FRANK J. LAUSCHE, Governor

RALPH E. DWORK, M.D., M.P.H.
Director of Health

306 Ohio Departments Building
Columbus 15, Ohio

STATE OF OHIO

DEPARTMENT OF HEALTH

June 18, 1956

Robert A. Kehoe, M. D.
Medical Director
University of Cincinnati
The Kettering Laboratory
College of Medicine-Eden Avenue
Cincinnati 19, Ohio

Dear Bob:

We have had quite a series of outbreaks of lead poisoning in Ohio. The number of laboratory analyses required has impressed upon us the advisability of developing a policy of limitation in this regard. It is with this thought in mind that we have prepared the attached memorandum which we are considering sending out to the physicians in the areas in which these outbreaks have occurred and for future use under similar circumstances.

As you will note, the first part provides an introduction about our services and the policies in regard to the laboratory services start at the bottom of page one. This is continued on page two and is followed by the summary and references in regard to lead poisoning. This was prepared primarily for general practitioners.

The reason I am directing this letter to you is because your name and "Kettering" has been mentioned in this memorandum, and secondly, I would like to have you review this material so that you might make such changes as you wish to provide the type of information that you feel, from your experience, would be most advisable.

One difficult question for us was what we should do in regard to the list of private laboratories that might be able to do lead analyses. At the moment, I feel that our only choice is not to mention any laboratory or to mention one that is already recognized nationally. It is for that reason the memorandum is prepared in that fashion. We must limit our laboratory services as we have indicated in the policy to establishing whether a health hazard exists.

I would appreciate it if you would go over the memorandum and make such suggestions as you wish and when we have your comments, we would be glad to modify this release accordingly. This material has not been sent out as yet as we thought it advisable to obtain your advice first.

Personal regards.

Sincerely yours,

Thomas F. Mancuso, M. D.
Chief, Division of Industrial Hygiene

TFM:ap

Enc.