

1616 N. 12th Street,
Reading, Penn'a,
May 24, 1938

Dr. Robert A. Kehoe,
University of Cincinnati,
Cincinnati, Ohio,

Dear Dr. Kehoe;

Many thanks for your kind letter--also copies of a series of articles published in the Industrial & Engineering Chemistry--relating to the detection of Lead in Biological specimen.

There are a few facts that are not quite clear to me. First of all, what limit of lead absorption do you consider safe from a clinical standpoint.

As previously mentioned, we are paint manufacturers, and it is our thought to keep close check on the men working around Lead products, and as soon as they approach the danger line, remove them to some other department in which they are not subjected to lead dust.

Would it be possible for you to give me the safe limits or any tests that would indicate that the men are absorbing too much lead in their system, to be safe from a clinical viewpoint.

Dithizone is a very delicate and sensitive reagent--detecting minute quantities of lead in urine, and in view of the fact that there are many sources of lead--such as water, also eating fruits, sprayed with the common insecticide--Lead arsenate, would show the presence of lead in people who have no possibility of lead poisoning.

Might mention the fact that altho we have our men examined periodically by a local physician--nevertheless, a man having an ache or pain, will in many instances, have it diagnosed as lead poisoning by his local physician--more so, upon learning that the patient works in a paint plant.

From your many years of study and experience with cases of this sort, feel confident you are in a position to give some very valuable information, and any suggestions you may offer will be greatly appreciated.

Again thanking you for the courtesies extended me in this matter,

Very truly yours,

Harry C. Hirsch

June 17, 1938

Mr. Harry Hirsch
1616 North 12th Street
Reading, Pa.

Dear Mr. Hirsch:-

In reply to your letter of May 24th, I must refer you again to the literature of this subject for your study. It is simply impossible to give you any intelligent answer in a letter to the questions which you raised. It is quite feasible to define dangerous lead exposure in terms of lead excretion in the urine and feces, and also in terms of the lead levels in the blood. We have found that when a man under conditions of lead exposure consistently keeps below 0.15 milligrams of lead per liter of urine, the likelihood of lead poisoning is slight. If the urinary lead excretion is kept below 0.10 milligrams per liter consistently, and if the level in the blood is kept below 0.05 milligrams per 100 grams of blood, cases of poisoning will not occur. However these levels are set on the basis of extremely precise methods of analysis, and they have no meaning whatever unless such precise analytical methods are employed. We have also shown that where the fecal excretion in somewhat dusty lead trades does not exceed from 0.50 to 0.75 milligrams per twenty-four hours, the danger of poisoning is substantially absent. Again I am referring to accurate analytical methods and I can assure you that there is no short-cut methods which will give you any results worth having.

You speak in your letter of Dithizone as a "delicate and sensitive reagent"..... which "would show the presence of lead in people who have no possibility of lead poisoning". In this you are quite right. The use of the Dithizone method or any other accurate analytical method will show the presence of lead in the blood and excreta of all persons regardless of occupation. Such methods, however, will also show the evidence of abnormal exposure to lead in that the lead content of the tissues and the excreta will increase as exposure increases. It is for this reason, and for reason only, that the examination of the excreta of workmen is useful in determining the magnitude of their lead exposure. However I must warn you again against any attempt to make either qualitative or inaccurate quantitative tests of lead in blood and urine as a means of detecting abnormal exposure only. Various persons have tried to do this and

no one has succeeded. Moreover no one will succeed since there is no analytical method which will give you uniform results in dealing with large quantities only. Moreover it is scarcely feasible that you will be able in a few weeks or a few months, to devise methods of studying this problem when it has required from ten to fifteen years of concentrated study at our hands to learn the background of information which makes possible the recognition of dangerous exposure. Again, therefore, I commend to you a period of careful study of the available information in the literature, and I particularly suggest that you obtain in some fashion the series of six articles which we published in the Journal of Industrial Hygiene in September of 1933. When you have studied these articles and when you have gained a knowledge of the principles around which you will have to work, I should be very much pleased to correspond with you further and to give you the benefit of any additional suggestions which we can provide. Moreover, if it would serve your purpose advantageously, I should be glad to have you visit us at the laboratory at some later date in order to see at first hand the details of the methods by means of which accurate results can be obtained.

Very truly yours,

RAK:is

Robert A. Kehoe, M.D.