

January 24, 1963

Mr. Jack H. Perry
Claims Adjustor
Liberty Mutual Insurance Company
First National Bank Building
Utica 2
New York

Re:



Company

Case #C815-498

Dear Mr. Perry:

The experimental work carried out in this Laboratory on animals as long as thirty years ago, to which I shall give you references at the end of this letter, demonstrated clearly that the absorption of tetraethyllead out of gasoline containing this compound of lead, in the maximum concentration which is permitted in commercial gasolines, through prolonged and repeated contact of the skin of animals, does not occur to a measurable extent. This fact (which has been verified since, by repeated experiments with animals,) was one of the principal reasons for regarding leaded gasoline as safe to distribute generally. Since that time, thousands of men have sustained contact of their skin with leaded gasoline in the course of their normal day's work in the petroleum industry - many of them to severe, frequently repeated, contacts. We have made many observations on the handlers of such gasoline, and have reported these in the literature, and thereby have demonstrated that what is true of experimental animals is also true of men. I shall cite references to these observations below. The reprints of these publications have been exhausted years ago, for this fact has come to be so well established, long ago, that no question has been raised about it in informed medical circles for many years. I had supposed that all physicians who read medical literature were aware of this fact. The attending physician in this case is obviously an exception. His opinion on this point, therefore, is clearly in error. If his patient had lead poisoning, it was not brought about by the type of exposure to lead which he described, as you have quoted him to me in your letter.

The statement of the physician, that this patient had typical lead poisoning when he attended him, may be true. But if it was "typical lead poisoning" of the usual type (which is due to the absorption of the inorganic compounds of lead) it was not tetraethyllead which poisoned him. Poisoning from tetraethyllead does occur under suitable conditions of exposure. There have been a series of cases in this

country and abroad, in connection with the cleaning of gasoline storage tanks, and these too are described in the literature. I'll cite a reference below. Because of the characteristics of tetraethyllead, it is distributed in the tissues of the body in a manner which is quite different from that of the inorganic compounds, and the clinical picture is totally different from that of the classical type of inorganic lead poisoning with which physicians generally are more or less familiar. Tetraethyllead is always an acute intoxication of the central nervous system, with mental aberrations which resemble the acute delirium of alcoholism (delirium tremens) more than any other well known clinical syndrome. Moreover, there is never any stippling, nor any other abnormalities of the blood, in this form of lead poisoning.

I think you should know that, as a matter of record, there has been no case of lead poisoning associated with the handling or mishandling of gasoline containing lead among the thousands and thousands of employees of the petroleum industry in the USA, except in connection with the cleaning of the sludge and scale from the inside of large storage tanks. Under the conditions associated with this work, a very peculiar set of combined factors result in the exposure of unprotected workmen to relatively concentrated vapors of tetraethyllead within the enclosed tank. If the job lasts long enough - many hours or days, as in the cleaning of large storage tanks - cases of poisoning, with fatal results, may occur.

In the case that has been brought to your attention, in this instance, it should be possible, even after the lapse of time since mid-September, to find out whether any considerable quantity of lead was absorbed by this man from any source. When lead has been absorbed in sufficient quantity to cause intoxication, many months are required, as a rule, to eliminate the lead. Therefore, samples of the blood should be analysed to determine whether inorganic lead has been absorbed, and samples of urine should be obtained and analysed to determine whether any tetraethyllead (from any source) has been absorbed (the concentration of lead in the blood is but little elevated by the absorption of tetraethyllead). We have been checking into cases of this type for many years, and if the physician in this case is willing, I shall be glad to send him the necessary containers, with instructions for their collection, for return to this Laboratory. I shall then be glad to report the results to him when they are available. The lapse of time since September will have resulted in some decrease in the lead content of the patient's tissues, especially if the elimination has been aided by therapy, but the elimination will have been far from complete, and we shall be able, in all likelihood, to establish the facts in this respect with reasonable assurance. I suggest that you make arrangements through this physician, or through another if it seems necessary, to have these analyses carried out here.

For many years, it was the regular practice of the petroleum companies to report all such cases to us for investigation as soon as they had any

knowledge of them. For the past ten years or more there have been so few alleged cases in any part of this country, that the physicians and the insurance adjustors have forgotten all about this procedure. For this reason, if such cases now come to our attention, it is likely to be long after the onset of the alleged illness. Sometimes it is too late to establish the facts.

There is no charge of any kind for the information which I provide in this letter. As a research unit in a public institution (University of Cincinnati Medical College) it is our business to disseminate, as widely as possible, information derived from our investigations. If, however, professional services are called upon, beyond information, we make a charge which will cover the cost to the Laboratory of performing such services so as to preserve funds earmarked for research from dissipation in this manner. For example, the charge for the analysis of a sample of blood or urine for lead (which includes the supplying of containers and instructions, as well as a signed report with interpretation) is \$12.50, or \$25.00 for analyses of both blood and urine.

Very truly yours,

Robert A. Kehoe, M. D.

References:

Kehoe, Robert A., and Thamann, Frederick. The behavior of lead in the animal organism . II Tetraethyllead; American Journal of Hygiene 13: 478-498, 1931.

Kehoe, Robert A., Thamann, Frederick, and Cholak, Jacob. An appraisal of the lead hazards associated with the distribution and use of gasoline containing tetraethyllead - Part I. Journal of Industrial Hygiene 16: 100-128, 1934.

Kehoe, Robert A., Thamann, Frederick, and Cholak, Jacob. An appraisal of the lead hazards associated with the distribution and use of gasoline containing tetraethyllead - Part II. The occupational lead exposure of filling station attendants and garage mechanics. Journal of Industrial Hygiene and Toxicology 18: 42-68, 1935.

Machle, Willard F. Tetra-ethyllead intoxication and poisoning by related compounds of lead. Journal of the American Medical Association 105: 578-585, 1935.