

January 19, 1940

Dr. Sullivan G. Bedell
512 Greenleaf Building
Jacksonville, Florida

Dear Doctor Bedell:-

Your letter of January 5th addressed to Mr. Costello of the Ethyl Gasoline Corporation was referred to me by Mr. Costello for reply. I am pleased to give you such information as I can on the subject of your request.

It is not easy to find satisfactory descriptions in medical literature of the effects of gasoline when inhaled in toxic concentrations, largely, I believe, because these effects, while dramatic, are usually of short duration and are usually unattended by permanent damage. It seems probable that the illness of your patient was due to the inhalation of gasoline vapors. These vapors have a toxicity and mode of action which are not unlike the vapors of such anaesthetics as chloroform and ether. They cause somewhat greater excitation, however. Any concentration in excess of one half of one percent will produce narcotic effects and complete unconsciousness, if prolonged. Lower concentrations produce general symptoms and signs of central nervous system intoxication, but usually not unconsciousness. As to the fumes of Ethyl Gasoline, these, in a practical sense, are no more toxic nor are they different in their behavior from those of ordinary gasoline. The concentration of lead in commercial leaded gasoline is so low as to be incapable of producing lead poisoning. Indeed the volatility of tetraethyl lead is so low in comparison to that of gasoline, that the vapors overlying liquid gasoline do not contain hygienically significant quantities of lead. It is not to be anticipated, therefore, that any person who comes in contact with the vapors of gasoline containing lead should receive any injury or illness as a consequence of the lead. Rather he would show only the signs of gasoline intoxication. It happens occasionally that the latter signs, if developed over a considerable period of time, persist for some time after the cessation of exposure. Usually persons who are promptly overcome by high concentrations of gasoline either die or recover promptly. This is not so true, however, if the person is exposed to intoxicating concentrations over a period of a number of hours. However we have not seen any permanent effects as the result of exposure to gasoline fumes.

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The only situation in which persons engaged in cleaning tanks might develop serious symptoms of lead absorption would be in those instances in which by accident a considerable quantity of concentrated Ethyl Fluid might have gotten in beneath the water bottom of the tank. If such Fluid were inadvertently introduced, it might settle promptly to the bottom of the tank where, lying under the water, it would remain out of contact with the gasoline above and so would not go into solution. It might also happen that if the tank had been used for a long period for the storage of gasoline, the crystalline decomposition products of tetraethyl lead might collect on the sides and bottom of the tank to be distributed into the atmosphere in cleaning the tank under dry conditions. It is because of these two dangers that we have issued detailed instructions for the avoidance of exposure in cleaning tanks which have been used for blending Ethyl Fluid with gasoline. If these regulations are followed, cases of illness will not develop. Accordingly in our experience, the chief difficulties in the cleaning of ordinary gasoline tanks are that the workmen and sometimes their supervisors, do not take enough trouble to see that the equipment is in perfect operating condition. Storage tanks should not be entered for cleaning without the workmen being equipped with airline masks in excellent condition. Even then every precaution should be taken to see that the tank does not contain explosive concentrations of vapors.

I should appreciate it very much if you would write me promptly, giving me the details of the exposure of your patient, together with a description of the onset and course of his illness. With such information I shall probably be able to tell you whether his illness was due purely to the inhalation of gasoline vapors, or whether lead absorption was in any way a factor in it.

Very truly yours,

RAK:ls

Robert A. Kehoe, M.D.