

February 11, 1941

Dr. E. S. Kronenberg
152 West Louthier Street
Carlisle, Pa.

Dear Doctor Kronenberg:

I am glad to give you the information concerning the possibility of the occurrence of lead poisoning as the result of exposure to or contact with leaded gasoline, in relation to the illness of your patient. First, however, let me say that dermatitis from contact with gasoline of any kind is not especially rare, and that individuals who have such contact may develop various types of injury. In the more common type of case, the exposed portion of the skin loses its superficial fat as the result of the solvent action of the gasoline, becoming dry and fissured and often subsequently involved in a secondary parasitic investation or infectious condition. Occasionally individuals develop a definite sensitivity to gasoline, so that even very minute exposure to liquid or vaporized gasoline will produce an acute dermatitis, not only in the exposed portions of the skin, but elsewhere. This condition has no relation to lead compounds in the gasoline, but is frequently the result of sensitization to some of the compounds which occur especially in gasolines of the modern type, which contain unsaturated and cyclic hydrocarbons as the result of various cracking processes. I might say at this point that as the result of these modern cracking processes in the manufacture of gasoline, present day gasolines seem to be more irritating to the skin than did the former straight run type of gasoline.

As to lead exposure, experimental work has shown quite clearly that tetraethyl lead in the concentration in which it occurs in commercial gasolines, is not absorbed in appreciable quantities through the skin. Tetraethyl lead itself is absorbed through the skin, but when diluted with gasoline its absorption is interfered with, and if the concentration is less than one part thousand by volume, no measureable absorption takes place. (The maximal concentration of tetraethyl lead in commercial gasoline

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is 1 part per 1260 parts of gasoline by volume, whereas most commercial gasolines contain considerably less than this). It seems apparent, therefore, from the extensive experimental work that there is no likelihood of the occurrence of lead poisoning as the result of skin contact with commercial leaded gasoline. These experimental conclusions have been amply verified, in my opinion, by the experience of the past fifteen years of general widespread commercial distribution of leaded gasoline. So far as we have been able to establish by extensive clinical investigation, no cases of lead poisoning have ever occurred, as a consequence of the handling of leaded gasoline, among some hundreds of thousands of garage mechanics and filling station attendants. Accordingly I should say that if your patient has lead poisoning, he must have some source of exposure other than that of contact with gasoline. I may say that there is nothing in the picture which you describe, which suggests that he has lead poisoning, with the exception of the fact that you say you think you are able to see a lead line. Without intending to be critical, I may say that I doubt the existence of a lead line. I can not remember ever having seen a lead line in the case of a garage mechanic, even among those who do a fair amount of soldering and other types of repair work which involve some exposure to lead. In other words in my experience the routine work of the garage mechanic does not involve hazardous lead exposure, and I have never seen a case of lead poisoning in this occupation.

Despite the statement above, I am very much interested in the case which you mention. Indeed I am all the more interested because of the unique character of this case, if it should develop that he has had significant lead exposure. Accordingly if you wish it, I shall be glad to send to you at once containers for the collection of a sample of blood and a sample of urine, together with detailed instructions for the collection of the samples in such a way that no contamination can occur. We can analyze such samples for their lead content and by this means will be able to determine the general magnitude of your patient's lead exposure. If he has absorbed appreciable quantities of lead, we shall be able to detect it, and if he has not, then it will be quite apparent that his condition is not the result of lead exposure. If you will meet me know at your early convenience whether you wish these samples obtained, I shall send the containers to you at once. May I suggest, in this connection, that if this is to be done, it should be done promptly.

Very truly yours,