November 4, 1938

Mr. Charles D. Russell
Realty Building
Savannah, Georgia

Dear Sir:-

Your letters of October 26th and 29th addressed to Dr. Herbert A. Lubs, as well as your letter to Mr. H. L. Miner of the E. I. duPont de Nemours and Company, were forwarded to me by the above gentlemen with the request that I provide you with the information which you desired. This came about, I dare say, because I and my associates in this laboratory have been engaged in the study of the problems of industrial and public health associated with the manufacture and use of tetraethyl lead, and also with the distribution of leaded gasoline since the initial experimental use of the product.

I think, in all fairness to you, I should explain that the illness of the man whose case you are handling has been reported to me by a physician in Savannah who wrote to me for information, presumably because of the published articles in medical literature which have issued from this laboratory. I shall give you the same information I gave him.

During the period of the past fourteen years or so, a series of investigations have been carried out in this laboratory and also by the U. S. Public Health Service, the U. S. Bureau of Mines, and the British Ministry of Health. The results of all these studies have been the same in that they have not given the slightest evidence that animals or persons exposed for prolonged periods of time to leaded gasoline, by wetting the skin or by inhalation of vapors, have absorbed measureable quantities of lead. I do not speak here of the occurrence of lead poisoning, no case of which has been reported or seen, so far as I can determine. I speak rather of lead absorption, without which, of course, no poisoning could occur. Persons who are exposed to lead compounds in such a manner as to absorb lead into their bodies show the results of such exposure by an increase in the excretion of lead, and by an increase in the lead in the circulating blood, and yet persons who have been grossly exposed to liquid or vaporized leaded gasoline over a period of years fail completely to excrete increased

quantities of lead. It is quite apparent, therefore, and it has been confirmed by suitable laboratory studies, that tetraethyl lead is n t absorbed ut of gasoline at the dilutions occurring i commercial gasoline. It is for this reason, no doubt t ther have been no cases of lead po or ng from th of su gasoline, despite the fact t at uch gasoli s been sed for cleaning tools and or ther purp es or wh it was not intended.

To answer certain of your direct questions: -

1. Tetraethyl lead occ rs in gasolines of the non-premium type in concentrati ns ranging from 1 part tetraethyl lead to 20,000 parts f gasoline up to 1 part tetraethyl lead in 2500 par s of gasoline. In premium gasolines, i. e. Ethyl Gasc ine, it is not in excess of 1 part tetraethyl lead in 126 parts of gasoline. All of these concentrations have b en shown to be much too dilute to permit of measureable at orption through the skin, or material loss of lead into he air by evaporation. Moreover it has been shown that if most of the gasoline is evaporated away in the outs de air, the lead which has been concentrated to a cons derable degree in the higher boiling fractions remaining does not penetrate the skin to any significant or measureable degree. (It is, of course, for these reasons that the U. S. Public Health Service concluded that the use and distribution of leaded gasoline was not attended by danger to the public or to the distributors of gasoline.)

2. You will be quite unable to find any literature showing that tetraethyl lead is dangerous when used as described in this case. No cases of poisoning or injury have ever been reported, and all the clinical and experimental evidence indicates that no danger of lead poisoning exists.

3. (your letter of Oct. 29th)

As indicated in answer 1, tetraethyl lead becomes concentrated in gasoline on evaporation of the gasoline, since its lower volatility will not allow it to evaporate as rapidly as the gasoline. Thus when the gasoline has been reduced in volume by half, through evaporation, the lead concentration will be almost doubled. Such doubling of the concentration will still not produce a dangerously high concentration, from the viewpoint either of skin [illegible]orption or inhalation because of the very minute concentr[illegible]on [illegible]f lead present in the original gasoline. Moreover [illegible]rom the v[illegible]wpoint of lead exposure by inhalation, it must [illegible]recognized that the total quantity of lead present in a buc[illegible]t containing several gallons of gasoline is quite small, s[illegible]small, indeed, that its complete evaporation into the air [illegible]uld not produce a dangerous situation except under the most unusual and deliberately designed experimental conditi[illegible]s.

I trust that I have answered your questions adequately. If not, I should be glad to give you any further information which I possess.

Very truly yours,

RAK:is

Robert A. Kohoe, M.D.