

December 1, 1942

Dr. Zolton T. Wirtschafter,
Medical Corps,
Station Dispensary,
Wright Field,
Dayton, Ohio.

Dear Dr. Wirtschafter:

I have your letter of November 19, to which I have delayed replying because of the pressure of other work. I should be glad to hear further from you when you have had a chance to consider my comments below.

First, let me point out that we have no information which would lead us to believe that the handling of leaded gasoline represents any lead hazard so long as the lead content of the gasoline is held within the limits of the commercial concentrations. The concentrations employed by the Army are not in excess of 4 cc of tetraethyl lead per American gallon. I am familiar with the specifications insofar as lead is concerned, and unless certain items of experimental work are being carried on in which higher concentrations are employed, there is no risk involved from the point of view of lead exposure, even if the gasoline is being used for degreasing. There is no absorption of lead through the skin to any measurable degree as the result of skin contact with such gasoline, and the opportunities for inhalation are very slight, and in fact, generally negligible under conditions in which the gasoline vapors are kept within safe limits. For these reasons, I have no fear of the lead hazards at Wright Field or elsewhere, as a consequence of the handling and use of gasolines that correspond to standard specifications. However, I repeat that if experimental work is going on with gasolines containing higher concentrations of tetraethyl lead, there may be a problem for investigation.

For a number of years a group of men at Wright Field were working with gasoline containing 6 cc of tetraethyl lead per American gallon of gasoline. We examined these men periodically and studied their urinary lead excretion. No evidence of lead exposure was obtained, and therefore, we concluded somewhat tentatively that the hazards associated with the use of gasoline containing tetraethyl lead in this concentration were not materially different from those associated with the normal commercial product.

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The simplest way of studying this problem in any group of men whose exposure is under suspicion is to obtain samples of blood and urine for analysis. Twenty-four-hour samples of urine are unnecessary, and this could be done by obtaining spot samples of urine and samples of blood at the same time. If you have a group of men whom you suspect of having lead exposure, I could send you tubes, needles, and bottles with instructions for collecting the samples, and we could analyze them and report the results to you with an interpretation.

As to instructions for handling leaded gasoline, we have advised against its use as a degreaser, largely because of the fire hazard on the one hand from gasoline with a low flash point, and partly because gasoline dermatitis will occur occasionally in rather severe form as a consequence of repeated contact, especially in gasolines that are high in unsaturated and aromatic hydrocarbons. We also strongly urge the limitation of the use of gasoline to the purpose for which it is intended, especially warning against the use of leaded gasoline in ordinary gasoline stoves and blow torches. (A gasoline stove has been designed for Army use which uses leaded gasoline, but provides for the removal of the lead before it reaches the burner.) I shall send you herewith a copy of the instructions which we think are useful in relation to the handling of gasoline.

We have considerable amount of information on the handling of gasoline under a wide variety of conditions and temperatures, and I shall be glad to give you any information that we have, if you will let me know what it is you had in mind with reference to "gasoline transport in desert and under other tropical conditions." If you are thinking of lead exposure under these conditions, I may as well tell you that in my opinion you are barking up the wrong tree. I can tell you in all frankness that we have never had any reason to believe that leaded gasoline is more dangerous to handle than is any other gasoline under the general operating conditions that prevail in various parts of the world.

Sincerely yours,

Robert A. Kenoe, M. D.

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Enc.

P. S. Under separate cover, I am also sending you a series of reprints.

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STATION DISPENSARY

WRIGHT FIELD
DAYTON, OHIO

November 19, 1942

Dr. Robert A. Kehoe
Kettering Laboratory of Applied Physiology
University of Cincinnati
Eden Avenue
Cincinnati, Ohio

Dear Dr. Kehoe:

I want to thank you for your kind offer to be of assistance to us here at the Field.

In regard to the exposure that I am interested in at the present time, I should like to say that it is the gasoline exposure. As you can see from the following table, a great deal of gasoline, all of which is leaded, is used here at the Field, and I am sure that you can be of a great deal of assistance to us in telling us whether it is properly handled and if any of the exposures are hazardous and, if so, what we could do about them; in other words, I should like to have you outline any plan that you deem adequate to follow to control the gasoline hazard, so far as the Field is concerned.

Number of gallons of gasoline used during October, 1942:

1. Flight Section	-	193 600	gallons of gasoline
2. Propeller Lab.	-	19 500	" " "
3. Power Plant Lab.	-	85 250	" " "

The above table does not include the miscellaneous uses of gasoline here at the Field.

I have seen the gasoline used as a solvent for degreasing parts and for cleaning airplane parts here at the Field in various workshops.

Specifically, I should like to know how one can best study this problem. I do not know from the records that are available here whether an actual problem exists. It seems to me, however, that it would be worth while to do lead studies of the men involved so that we could settle the question of exposure and absorption.

Have you had any reports of gasoline transport in desert and under other tropical conditions?

I wish you would send me your instructions and recommendations as to how gasoline is to be handled, what uses and usages are to be forbidden, and a short outline of how you would suggest that these men be studied. The specifications of the gasoline that is used on the Field

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is restricted information. However, if you need this information, I will be glad to give it to you as soon as I receive the specifications from the Specifications Branch.

Thanking you for your interest and for your kindness, I remain, as ever, your friend,

Zoltan T. Winterschaffer
ZOLTAN T. WINTSCHAFTER
Major, Medical Corps

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