August 14, 1961

Dr. P. S. I. Barry
The Associated Octel Company Limited
Medical Services
Ellesmere Port, Cheshire

Dear Pat:

You will have had reason to suspect that I have ignored my promise to you, as long ago as last April, to obtain information about several matters of concern to you. The facts are almost that bad, but my negligence has not been one of intention. I have been struggling against a series of deadlines involving manuscripts, and other pressures relating to overdue reports, and I simply had to let my correspondence - that is anything that could wait - lapse until I should get out from under. I very nearly succeeded in clearing my desk before getting out for a vacation. Having had none last year, I could not justify delaying or passing up a much needed break. So I picked up the last remaining items of unfinished business and brought them along with me to Steamboat Springs, Colorado, with the idea of attending to them on a rainy day, or when some sense of duty should impress itself upon my otherwise carefree spirit.

I have not been wholly idle, however, on your behalf. I have looked into the weathering of sludge, and I have also made some suggestions in connection with the standard for lead in air as it relates to TEL in the publications of Ethyl and duPont. As to the experimental work on TML in parallel with TEL, I have asked that a further progress report be prepared by the time I get back from my vacation. I will supply you with a summary of the information to date just as soon as I can catch up with the urgent correspondence. We shall have completed - or nearly so - the survey of the personnel engaged in handling TML (in gasoline) and the environmental survey in that same relationship, on the West Coast by the time I return home (September 1st), and I shall supply you with that report when we can complete it. An additional survey, in collaboration with the U.S. Public Health Service and the California State Health Department, is under way to determine the present status of lead in the air of three cities, Philadelphia, Cincinnati and Los Angeles. You can appreciate the fact that my time has been well occupied for the past several months.

Now for some brief comments on certain of the matters referred to above:

(1) I have gone over the report on the weathering of sludge, as a method of disposal, and I can find no fault with it. The evidence seems to me to justify the conclusions arrived at. Indeed, we have no information from our own investigation of this matter that would suggest that there are conditions under which it does not work effectively. If your people have evidence to the contrary, I'd like very much to have it, for it would indicate that there is a significant variable, climatic or otherwise, which must be taken into account. I have no present reason to doubt the efficacy of the method.

(2) The investigation of the comparative toxicity of TML and TEL is of necessity a long-term affair, in which, as I have indicated previously, the immediate effects of a single period of exposure is of little importance. (This may have some significance in connection with the cleaning of tanks, or in emergencies involving accidental exposure to very high concentrations in air, but otherwise it is of little more than academic interest.) The real problem lies in the behavior of relatively small quantities that are absorbed from day o day in the manufacturing operations. Here, there are some significant differences between TEL and TML, so far as the experimental work is to be considered. Whether these have practical significance in relation to man is another matter. We are approaching this in several ways, and instead of attempting at this time to give you further information, I prefer to wait and send you a progress report, with such practical interpretations as can be made after a careful examination of all of the available facts. From the practical viewpoint, however, the manufacturing standards of safety, with respect to TML, are the same as those applied to TEL, and there is no present reason to doubt that they are entirely satisfactory. There has been no trouble or worry of any kind - except, of course, the explosion at Baton Rouge, which has no bearing on the toxic properties of TML. You will hear further from me on this problem when there is something definite to say. For the present, you are safe in believing that what we learned from our original investigation of the series of lead alkyls, years ago, is true - namely, that these compounds have the same basic properties, with minor variations that have little practical significance.

(3) The supervisory investigation of the hazards of handling gasoline containing TML has confirmed fully the results obtained in the briefer trial usage in the garage in San Francisco. After a full year of occupational exposure to the conditions that exist in the industry, the men so engaged show no evidence of having absorbed any lead in the course of their work. That is to say that the increment of occupational absorption is too small to be measured by the methods employed, which we know to be highly sensitive.

The analytical results on the air are such as fully to explain the negative results yielded by the men. It is quite evident that my original fears on this score were groundless in the quantitative sense. That I should have been so far off in my estimation of this hazard is a source of some slight embarrassment to me, personally, but no one but myself seems to be critical of my misjudgment.

(4) Of the efficacy of the charcoal canister in handling TML, I have no doubt, but I'm ashamed to say that I forgot to make inquiry about the investigation of the precise facts. I feel sure that this has been done at Baton Rouge, but I have no information. I'll let you know about it as soon as I can. Perhaps, meanwhile, you can let me know what your people have found.

You will be interested and perhaps surprised, if not amused, to know what a time I had in getting the manuscripts of the Harben Lectures completed. I extended the subject matter somewhat and improved upon the presentation in the Lectures. The bound copies will be available soon, and I shall see that you are supplied with copies. These will serve a useful

purpose in the background of the lead anti-knock business. When you and your associates, and particularly, Mr. Bevan, have considered the matter of the usefulness of this monograph, you might let me know how many copies of it you would like to have for reference and distribution within your own and associated groups. I have ordered one thousand copies bound in hard covers. I'll have some number of these sent to Mr. Bevan, if you or he will advise me. I wish not to be profligate in their initial distribution, but rather to put them where they will be appreciated and useful. It would be both good taste and wise policy to distribute them with careful discrimination and I solicit your advice with such promptness as may be convenient. They can better be delivered to 20 Berkeley Square by the Royal Institute than to be sent to Cincinnati and then be returned to London.

I promise to write and attend further to these matters of mutual interest soon after the end of my vacation, if you will pardon me for my seeming neglect. Meanwhile, however, until the end of August, I shall be loafing and fishing in the beauty and restfulness of the Colorado mountains.

With all the best regards to yourself and your family.

Sincerely yours,

Robert A. Kehoe, M. D.

Dictated but not read.

P.S.

I'll also send you some reprints of our published work on some other subjects, including that concerned with carcinogenic materials and accelerators in petroleum. I will include with these some further information on the manganese compound referred to in your letter of March 27th to which I failed to reply. For your immediate information, I can tell you that this compound is quite toxic - of the general order of magnitude of the lead alkyls - but that it offers no special problem as a component of an antiknock compound, since the manner of its safe handling is identical with that employed in the case of TEL. The concentration in gasoline is low and insignificant in terms of occupational exposure, while the combustion products are essentially harmless in the concentrations employed. I'll write to Dr.King and send you a copy of my letter.

R. A. K.

RAK:ss