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June 5, 1951

Re: K.2.

AIR MAIL

Dr. Philip Boyd
The Associated Ethyl Company Ltd.
Northwich Cheshire
England

Dear Doctor Boyd:

It was a pleasure indeed to hear from you on May 21, and I can only say that I should have written a reply much sooner. As usual, this has been a very busy period, and it has been somewhat more crowded by the necessity of attending certain scientific meetings and in preparing for that purpose.

With reference to your specific question, the problem associated with the use of canister masks in handling sludge is a difficult one to deal with in a precise and categorical manner. The difficulty is that one does not know and cannot anticipate, with any reasonable degree of accuracy, the concentration of tetraethyl lead that may be in the air breathed by men who handle sludge. It is not so much a question of the time factor as of the factor of concentration. The thing we have been most fearful of, in dealing with situations in which men might be exposed to high concentrations of tetraethyl lead, particularly in association with gasoline vapors, is that the mask might be flooded and might, therefore, become quite inactive in taking tetraethyl lead out of the air. For this reason almost any arbitrary period of time that is set for the use of these is somewhat subject to question. We originally set the period of eight hours, on the basis that it was the day's work, and that, therefore, it was advisable to change the mask, or the canister rather, before beginning a new day's work. Actually in dealing with very bad situations, such as, excavations in badly contaminated soil, we have never felt that the canister could be used as long as one day. Usually a change has been made at the end of an hour or so under these circumstances. Generally speaking, in the handling of sludge, the likelihood of these difficulties is not so great. For this reason I cannot quite justify an arbitrary period of hours, as anything more than a makeshift, or an educated guess. Under the circumstances which you describe, I should certainly feel that an additional four hours of use would not prejudice the safety of men working in this way. Such observations as we have made by analytical means on the lead absorption of the canisters has failed to show that they have ever reached anything like their absorption capacity. For this reason I feel that no risk would be taken in granting leeway. On the other hand, there might be circumstances in which one was dealing with a particularly unfavorable set of conditions, in which this period of use might well be unsatisfactory. I refer here, especially, to certain difficulties we have from time to time, in

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which a bad spill of ethyl fluid, or of gasoline containing high concentrations of ethyl fluid, occurred in connection with mixing operations, contaminating a large or small area, which then had to be cleaned up and decontaminated. In one of these, recently, the situation was very bad, and we resorted to the use of air analyses at frequent intervals and also to frequent changes of canisters.

It is apparent that a considerable amount of work could be done, and probably should be done, to determine the maximum capacity of the charcoal under a variety of conditions. We have not done this for a number of reasons. One of these is that the situations are highly variable, and thus one would have to explore quite a variety of conditions. Another is that the charcoal itself is somewhat variable, and therefore this matter would have to be explored, and possibly certain specifications would have to be set. On the whole, we have regarded the problem as so difficult to deal with, on a strictly quantitative basis, that we have, I fear, neglected it somewhat. I may add that we have never had any serious difficulties of any kind in connection with the use of masks, and this has been another reason for a certain degree of complacency in this matter. In other words, we have undertaken to maintain a rather large safety factor, and the evidence, to date, has been that this has been quite satisfactory. I think it is fair to say that the safety factor has been very large indeed, and for this reason I have no hesitation ^{in saying} that you have a considerable leeway.

I shall look forward to your coming to visit us. Meanwhile, if other matters come up that puzzle you, or if you feel that I can be of any help to you at any time, please do not hesitate to write to me.

Sincerely yours,

Robert A. Kehoe, M. D.

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