November 16, 1959

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Dear Doctor Goldsmith:

Please accept my thanks for your letters of November 2nd and 5th, and for the information which you attached to the latter. I am grateful to you for bringing me up to date. This letter, however, is in reply mainly to the first of your two letters.

First, let me say, emphatically, that I am in full accord with our "mutual agreement" as to the responsibility of industry, both generally and specifically, to solve the hygienic problems associated with its activities. The work of this Laboratory and most of the activities of my professional carrer are based on this principle. It is important to recognize, however, that this is a relatively new concept in American medicine and hygiene and in industrial policy. I should not like to suggest that I invented this idea, for I only it more vigorously and implemented it more effectively than most of our colleagues had the opportunity of doing. I can say, with complete candor, that there is no better example of this in American industry than the performance of Ethyl Corporation in its safe guarding of the manufacture, distribution and use of tetraethyl lead. This has been a good example which I am proud to have had a hand in, and it has had a significant influence on the attitudes of other industries in this country and abroad. The principle of which we speak is achieving increasing acceptance, and the present community is even ready to accept legislation based on that principle. All of this has come to pass since the middle twenties of the century. When, therefore, you point out that this (the appropriate investigation in advance of the exploitation of tetraethy lead as an antiknock agent) had not been done by 1926, you are not entirely correct, on the one hand, and you are asking for something as unprecedented up to that time, in industrial and preventive performance, as is humane and socially responsible action in international relations at the present time. The understanding of industrial management, in hygienic matters, had not reached a sufficiently high or general level to make this possible. On the other hand, the astuteness of the technical people who had discovered the role of antiknock agents and had brought tetraethyl lead into use, had led them to initiate an investigation of the air-pollution problem at the hands of the U.S. Bureau of Mines (Published Report of 1927) in the year 1923. This Laboratory carried out a field investigation at the expense of General Motors Chemical Company (the predesessor of Ethyl Corporation) in 1924 - 25, prior to that of the U.S.P.H.S. in 1925. These investigations were

not done as they would be today, but the art of such investigation was in its early stage, as was the appreciation of the need for, and justification of, such investigations.

Speaking broadly, we in the United States have come a long way since 1926, and lest you should persist in your belief that "it seems unlikely that the proper studies" will now be carried out, let me say that experimental work for the purpose of determining the hazard or safety of the situation with reference to lead in air, and also of the proposed increase in the maximum concentration of tetraethyl lead in gasoline has been under way since 1947.

The Kettering Laboratory has had funds to use for this purpose from the industry most concerned, at a level of approximately $100,000.00 per year over that length of time. We have done, with most of this money, the one thing which we have believed to be most essential, namely - the acquisition of a sound understanding of the metabolism of lead in the human organism at various levels of intake and absorption over prolonged periods of time. The purposes behind this work have been fully understood and approved by the technical people in the industry, who are fully aware of the necessity of knowing the facts. They know, out of self-interest, that they cannot afford to be either ignorant or wrong in this matter. They are, in addition, however, good and responsible citizens, with concern for the welfare of the community.

In this connection, I must point out that the regret expressed in the recent report of the Public Health Service relates primarily to the failure of the Service (for sufficient reasons, I believe), itself, to carry out the investigations recommended in 1926. What happened was that the industry accepted the responsibility for these investigations and sponsored them in The Kettering Laboratory under my direction. At that time there seemed to be no urgent necessity for the U.S. Government to embark upon such investigations, and actually no funds were made available for the purpose by the Congress. Much work was done, however, and I accept the full responsibility, for myself and my associates, for what has not been done, as well as that which has been done. We obtained the money which we believed to be sufficient to do the job, and most of the job has been done. It is my fault, if fault it is, that much of this work has not been published and that the information which has been published has not been interpreted fully in relation to this problem. The reasons for this state of affairs are reasonably clear, and yet no reason is sufficient to make up for such a default, if and when it becomes apparent. The reasons are that I have been too busy with other things within the Laboratory and in such other professional activities as the work of the AMA Council on Industrial Health, the work which has led to the official recognition of the specialty of Occupational Medicine, and its incorporation in the American Board of Preventive Medicine. These activities have gone on hand in hand with the graduate educational program of this University in the field of occupational medicine and hygiene, and because of them, the publications and the editorial work of the Laboratory have shffered.

In this situation, I have not been able fully to document our position, somewhat to my embarrassment, and also to the discomfiture of the Surgeon

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General's ad hoc Committee, which has had to base its conclusions almost solely upon the publications, and the unpublished information, provided by The Kettering Laboratory. This, admittedly, is a somewhat awkward position for the Public Health Service, and this is the explanation of the remarks concerning the inadequancies of presently available and acceptable (published) information. Actually, the situation is not nearly as unsatisfactory as these remarks seem to imply. Let me point out why I say this.

(1) We are on the point of completing a field investigation involving some 500 persons, whose exposure to lead in their work in the petroleum and automotive service fields cannot fail to have been greater than that of persons in the general population. The statistical task here has been a large one, and the report has been delayed by reason of some other more pressing items of our work. This is the fourth investigation of this type which we have carried out since 1926.

(2) Regardless of what any one else may do, we expect to follow up this last investigation with a series of similar but more localized observations in a number of areas in which we have some reason to suspect that the exposure to lead might be somewhat more severe than those to which many of our 500 people were subjected. In Los Angeles, for example. That is to say, that we are looking critically for the most severe conditions we can find. These are not likely to be city-wide in their impact. Rather they will be specific sites at which the concentration of automotive exhaust fumes will be relatively high because of factors which reduce their dissipation. We have been looking for such sites for some years, and in consequence have investigated several public service or industrial garages into and out of which, fleets of cars (or aeroplanes) have been operating.

(3) We have provided analytical and consultation services in a variety in industrial situations in many parts of the United States (and some in Canada), and have obtained much of the most extensive data in the world on the levels of urinary lead excretion and of lead in the blood of various representative segments of our population.

(4) We have analyzed the tissues (obtained at necropsies) of a fairly large number of persons from various walks of life, and we know a great deal about the lead content of human tissues under various conditions, including those associated with fatal lead poisoning.

(5) We have, as you know, carried out prolonged, day-by-day determinations of the lead metabolism of a fair number of human subjects (now about twenty) whose lead absorption was being maintained at certain specific levels during these observations. From these experiments, we have a good basis for the interpretation of the relationship between body burden and excretory rate (and, better, between body burden and the concentration of lead in the blood), if information is available on the duration of the lead exposure of the individual.

It is just not true, therefore, that our information is scanty and not

entirely relevant. The contrary is true, and although there is not yet enough information to fulfill the purpose which your Department and your Committee have been asked to implement, the country and your State are not in a precarious position in this matter. Moreover, I am not prepared to concern myself with the likelihood that the information which has been obtained in this Laboratory will be regarded as of dubious validity because the bill for obtaining it has been paid, largely, by Ethyl Corporation, with some additional support, in recent years, from du Pont. On the contrary, I am pleased to assert that these organizations have accepted their responsibility for knowing where they are going in this relationship to the public health, and that they have provided us with the funds which we have requested, to obtain the information which we have believed to be necessary. I make no apologies for what we have done or failed to do, but I say, in all sincerity, that if what we have done is inadequate, it is our fault, primarily mine, and not that of the industry concerned. It is for this reason that I cannot, in honesty and fairness, remain silent, when you imply that this problem is not likely to be solved by the industry. Indeed, the industry will attempt, as well as it is able, with the guidance under which it operates in hygienic matters, to solve this problem whether or not any other group moves in that direction. This has been its policy for thirty-three years, and it is unlikely to change in that respect. If, on the other hand, its guidance is inept, it may fail in its purpose. This I admit.

This letter, I fear, has become unduly long. Perhaps its justification resides in a certain inner necessity, on my part, to defend myself against the implication that, in this matter, I am something of a special pleader. It may be that I am sufficiently involved in it, emotionally, that I can only see my side of it. I beg to doubt this, however, in view of the fact, which I believe can be substantiated by a bit of inquiry, that I am fairly hard to convince except on the basis of evidence; that I am more conscious of the incompleteness of our own work than are many of my professional peers; and that I have been slow to take a firm position but have yet to back off from a considered professional judgment which I have expressed on the basis of experimental evidence.

Sincerely yours,

Robert A. Kehoe, M. D.

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