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July 14, 1966

Pennsylvania State Air Pollution Control Commission
c/o Department of Health
Division of Air Pollution Control
Post Office Box 90
Harrisburg, Pa. 17101

Gentlemen:

We have been advised that your Commission is considering the drafting of air quality criteria, including use for lead. We would, therefore, like to inform you of research programs which the lead industry has under way and which are concerned with low level exposures of the kind likely to occur in the ambient atmosphere and which are designed to provide scientific answers to questions likely to arise when criteria are being determined.

About four years ago members of the lead industry and the U.S. Public Health Service agreed that it would be wise to design a project, or projects, which would lead to answers to the question as to what effect low level exposure to lead would have on the human system and to attempt to quantitate such exposures in terms of concentration of lead in air. The Kettering Laboratory set up an experimental protocol that would use human volunteers in exposure chambers and expose them to low level, and increasing amounts of lead in air. The levels of lead maintained in these inhalation chambers would be progressively increased in suitable increments of concentration and time.

In order to test whether or not such an experiment would give significant results, the first phase attempted to measure the effect of continuous exposure at 150 micrograms per cubic meter of air. You will remember that 150 micrograms per cubic meter of air was the old industrial hygiene exposure limit for eight hours a day. This phase of the experiment was completed and showed that when human beings are exposed continuously to 150 micrograms per cubic meter of lead in air, in somewhat



Lead Allied with Lead

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over two years blood lead levels would reach 80 micrograms per cent, which is the limit prescribed by Dr. Kehoe below which clinical manifestations are not found. The most important reason for performing this first phase was to test the method and to determine whether it could provide significant results without the necessity of confining a human subject in an exposure chamber for 24 hours a day. Here is a brief outline of the experimental method that was used:

First an exposure of two hours a day until equilibrium values of lead in blood were reached, then four hours a day until equilibrium values of lead in blood were reached, then eight hours a day and finally sixteen hours a day. Using these equilibrium blood values as points on an exposure curve it was possible to extrapolate the curve to the point of twenty four hours a day. This satisfied us that the use of incremental times gave significant results, results which coincide with those obtained in other human exposure studies.

Each of these experiments requires at least one year to complete and we are now in our third year of operating this study. We now have two men being exposed in inhalation chambers and plan to continue the study until significant and reproducible results have been obtained.

Financial support for these studies, as well as several other inhalation chamber studies using rats as confirmation, is provided by the lead industry, The American Petroleum Institute and the United States Public Health Service. The State Health Department in California has agreed with us that these are valuable experiments and that the results will be of great interest to them when they are ready to determine air quality criteria for lead.

We, therefore, suggest to your Commission, that the results of these experiments will be of equal value to you in the determination of rational and scientific air quality criteria. This study is being performed in the public interest and the results will be made known to all interested parties.

Thus far sufficient data has not been accumulated to provide a number, or numbers, that would be of scientific significance. We have assumed that air quality criteria for toxic materials should be derived from data that is significant in terms of human health. Our studies are unique in the field of air pollution, are of course exceedingly expensive in terms of dollars, but, what is most important, give us results that directly relate to human physiology, results that do not have to be extrapolated from one animal species to another.

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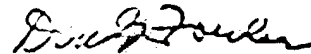
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The lead industry has in the past, and will continue in the future, to act in a responsible manner and will cooperate with all interested Government and private agencies in evaluation of lead and the public health. Our industry and its members have spent many millions of dollars on the evaluation of the relationship of lead to problems of health; therefore, we believe we are in a position to ask your cooperation, and to cooperate with you in the establishment of scientific and reasonable air quality standards. In our opinion one of the most important activities of Government agencies in the field of air conservation and pollution control is the establishment of reasonable air quality criteria. The report of the Research Management Advisory Panel to the Committee on Science and Astronautics of the U. S. House of Representatives, which is entitled "The Adequacy of Technology for Pollution Abatement", makes the following statement which is pertinent to our discussion here:

Once the goals of pollution abatement are agreed on, attention can be directed to the equally important questions of how the goals can be attained most effectively, and who should pay the costs of measures to bring about the desired conditions.

The Panel believes that science and technology must play an important role in finding answers to all of these questions. Goals that are not in harmony with the scientific principles underlying the field may never be attained.

Very truly yours,


Don G. Fowler

DGF:jb

cc: Mr. Allen D. Brandt
Mr. Victor E. Sussman