

October 22, 1949

Dr. J. R. Albrecht,
Plant Physician,
Auto-Lite Battery Corporation,
Vincennes, Indiana.

Dear Doctor Albrecht:

I shall undertake to answer the questions in your letter of October 14 as well as I can. First, let me say, however, that I am not primarily responsible for the standard with respect to the lead content of the air of workrooms, although I know the background of the standard quite well indeed. The standard is, more or less, a rule-of-thumb, which applies to dust more than to fume. It is generally recognized among industrial hygienists that the potential hazards of occupational exposure to lead vary greatly with the solubility and state of supervision of the lead particles in the atmosphere. The standard is concerned with highly efficient methods of collecting the lead from the atmosphere, and therefore it is based on the use of the electrostatic precipitator when dealing with fume and the use of the impinger apparatus when dealing with industrial dust. In general, it is fair to say that certain highly insoluble dusts are low in their toxicity, and that finely divided fume is relatively high in toxicity. Fundamentally, however, this relates only to the extent of the absorption of the lead compound and not to any essential difference in toxicity otherwise. In any case, the standard which has been developed is recognized as inadequate to meet all situations, and therefore it is intended to apply to the more dangerous forms of lead in the atmosphere. I repeat, however, that it is based on a highly efficient method of collecting the lead compound, and it fully recognizes that the smallest particles are the most dangerous.

Actually, if you want my opinion, which is based on our own observations and those of others, this standard is not low enough, if one is dealing with lead fume. The latter is readily absorbed from the pulmonary tissue, and to the best of my knowledge and belief, men exposed continuously (that is, every working day) to concentrations of this order of magnitude will absorb quantities of lead which will become dangerous after two or three years of employment. For our own purposes in the tetraethyl lead industry we do not regard the conditions as satisfactory if the lead concentration is in excess of 0.75 mg. of lead per 10 cubic meters of air. Even so, we keep careful and continual watch on exposed personnel both by clinical means and by the analysis of blood and urine, since, in our experience, this is the only means by which we can remove men from exposure in time to avoid episodes of illness.

I might conclude this discussion by saying that, at present, no

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informed person would undertake to measure lead fume in the atmosphere by the impinger method. Even with the electrostatic precipitator one has to be very careful to maintain a very high voltage (around 14,000), or the electrostatic field will not act with suitable efficiency. The equipment, therefore, has to be maintained in excellent condition and tested critically in this respect at frequent intervals.

Sincerely yours,

Robert A. Kehoe, M. D.

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