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July 16, 1970

J.F. Cole, Sc.D., Manager
Environmental Health
International Lead Zinc Research Organization, Inc.
292 Madison Avenue
New York, N. Y. 10017

Dear Jerry:

LH-160 Effect of Particle Size on the Absorption of Lead by Man
LH-75 Human Exposure to Particulate Lead Compounds in the Air Under Experimental Conditions

I have asked my right hand technical assistant, Mr. Lawrence Schafer, to prepare a memorandum for you (and to forward it to you in my absence) on the preparation of the aerosol which we shall employ in the chamber, in carrying out the experimental work on the project identified as LH-160, and by the sub-title, "Effect of Particle Size on the Absorption of Lead." This, I believe, is the same technique (with some mechanical improvements) which was employed in our earlier work on particles of the order of 0.75 and 1.00 micron in diameter. This experiment is an extension of those carried out earlier on the same general subject.

As to the data of my report on the experiments carried out at the level of 10 and 20 micrograms of Pb (compound - lead sesquioxide) per cubic meter of air, I must tell you that I am in a bit of a dilemma. I have assembled all of the data, including the arrangement of the frequency distributions and the calculation of the mean values of the following items of the behavior of the subjects; concentration of lead in the blood for each 28 day period (determined 1 or 2 times weekly); daily concentration of lead and daily output of lead in the urine, over each 28 day period; amount of lead in duplicates of food and beverages consumed daily during each 28 day period; amount of lead in all feces evacuated during each 28 day period; in like manner, data obtained during each 28 day period as to volume of urine, weight of feces, weight of food and beverages, weight of subject, concentration of coproporphyrin in urine (of both subjects) have been calculated; the mean daily concentration of -aminolevulinic acid in urine of one subject (R.H.) has been calculated; the numbers of stippled erythrocytes found daily (each 28 days) in the peripheral blood (same as te reticulocytes); These data have been examined, and a chart has been prepared (to enable careful study of relationships, if any, to be made). I was occupied in the preparation of this chart from the original data, as the latter had been dealt with statistically (simple calculations of mean values) by a member of my staff (Mrs. Mergard) with my help in the design of the frequency distribution, while residing in San Francisco from mid-January to mid-March, 1970. That is as far as the study has gone, but a statistician of Ethyl Corporation has taken this chart, and duplicated copies of the data for a further statistical examination of certain pertinent questions. The problem which presents itself is that there are relationships which require very careful examination in view of the slight differences (in the one instance) and the seemingly negligible differences (in the other) which exist in the behavior of the subjects in periods of exposure as compared with periods (control) of no exposure. Briefly to state the matter, one of the subjects responded very

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slightly (negligibly, in my view) to his exposure to 10 micrograms (at the scheduled rate), and only a little more to his exposure to 20 micrograms; the other subject had exposure (of a somewhat more severe - more prolonged - type) to 20 micrograms alone, and it appears that there was no response. (The response referred to was that of a significant increase in the concentration, or the output of lead per unit time in the urine, or a significant elevation of the concentration of lead in the blood.)

It is apparent that this study will require a considerable amount of time in order to reach conclusions which cannot be questioned seriously. This would lead to a publication with adequate documentation of the position taken by the author(s). I have concluded, therefore, that prior to the preparation and publication of a fully documented report which would be suitable (as to its factual content) for publication, I should prepare a progress report in which the available facts are stated and the trends indicated together with the questions which are to be answered. I have started the preparation of such a "report of progress" but am unable to complete it until after a scheduled vacation. I plan to go to a wilderness area in Montana, leaving Cincinnati on July 19 and returning on (or about, possibly earlier) August 17.

An additional factor in the delay, thus far, in the issuance of such a report, has been my involvement in the editorial work required for the issuance in the Archives of Environmental Health, of a series of papers from a Conference (on standards in occupational health in lead industries), held in Amsterdam in late November of 1968. This is a very worthy enterprise which I was unable to avoid (unless I simply refused to cooperate with a group of outstanding European colleagues in Occupational Medicine who had been authorized to make a report to the International Association for Occupational Medicine). This is requiring of me a great deal of time-consuming editorial work, which while advantageous, is a serious obstacle to the performance of my own work.

I suggest at this point in this matter, that you give me something of a dead-line which should be met in the completion of such a progress report. Also, it would be helpful if you would let me know the number of copies of such a report which I should send to you. My last progress report was delivered in February or perhaps very late in January. I can do better than that, and it would really be helpful if you would prescribe the date. If I can meet it, I shall do so. If I cannot (that is if it is now too late), I shall have to abide by the consequences.

I regret that I must seem to be full of explanations for not doing as much as I should. I must say, however, that it is difficult to carry the load of responsibilities which I seem to acquire. For example, I am invited to be in an extremely significant (for international, more than national purpose) conference in Prague in October, and I would like very much (for truly professional reasons) to go, but I hesitate to plan to do so when I am in arrears in my production.

Sincerely yours,

RAK:wb

Robert A. Kehoe, M.D.
Professor Emeritus of Occupational Medicine

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