

June 17, 1936

Mr. J. D. Birchard
The Goodyear Tire and Rubber Co.
Akron, Ohio

Dear Mr. Birchard:

Dr. Schneider has written me requesting that I send you such information as is available in this laboratory with reference to the lead problem which you mentioned in your letter to him.

In as much as I am not entirely familiar with the processes, I am not in position to give you precise information as to the magnitude of the lead hazards which may be associated with this type of work. I assume, however, that you are dealing with either the vapors of lead or finely divided dust suspended in the atmosphere. The magnitude of the danger will, of course, depend upon the concentration of lead particles in the atmosphere breathed by workmen. There is a secondary factor in that particles of various size are dealt with somewhat differently in the respiratory apparatus. Extremely finely divided particles are likely to be breathed out with the exhaled air, whereas quite large particles are likely to be stopped in the upper respiratory tract. Thus particles of intermediate size are most dangerous from the point of view of absorption. Tests of the magnitude of the hazard may be made by two means; one, the determination of the dust concentration in the atmosphere in different parts of the plant, and two, the study of the lead excretion of representative workmen. Figures are available to demonstrate the probable significance of the exposure in terms of results obtained by these two methods. It is now believed, as a result of the studies of Bloomfield and his associates in the United States Public Health Service, that lead concentrations in excess of 1.5 mgs. per 10 cubic meters of air may be productive of lead poisoning. That is, the threshold concentration is approximately of this order of magnitude. On the other hand, lead poisoning is infrequent and lacking in the severer manifestations if the concentration does not exceed 5 mgs. per 10 cubic meters. In terms of lead excretion as determined by methods of analysis of equivalent sensitivity to those we have used, the danger point is certainly reached if the daily alimentary evacuation contains lead in excess of 1 mg., and if the urine contains more than .15 mgs. per liter with regularity.

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The problem of prevention in trades where there is dust or fume depends almost wholly upon adequate carefully designed and carefully checked ventilating equipment. In order to determine whether or not the ventilation is adequate under variable conditions of plant operation, it is necessary to make air analyses or analytical studies of representative men at intervals.

Medical supervision of men under conditions of dangerous lead exposure represents one of the most adequate means for determining whether or not the precautions are adequate. The details of such medical supervision require rather lengthy discussion and are scarcely amenable to treatment in a brief letter.

I am sending you herewith some articles which discuss various aspects of the problem of lead intoxication. Unfortunately my supply of reprints of articles which deal with a series of lead trades is exhausted. These papers will be found in the Journal of Industrial Hygiene for September 1933 (Volume 15). Some of the more important recent articles on lead hazards in dusty lead trades will be found in the Bulletins of the United States Public Health Service as prepared chiefly by Bloomfield and his associates. These can be obtained by sending to the Superintendent of Documents - Washington, D. C. There is a very extensive bibliography in this field, some of which will be referred to in the articles mentioned.

If I can be of any further service in providing you with information, I shall be glad to do so.

Very truly yours,

RAK:ls

Robert A. Kehoe, M.D.

P.S. I find I have one very badly used copy of a series of articles which may be of some interest to you. I apologize for the state of the booklet, but it is not too badly damaged to be read. RAK.