



STATE OF NEW YORK
DEPARTMENT OF LABOR

ALBANY

NEW YORK OFFICE 80 CENTRE STREET

EDWARD CORSI
INDUSTRIAL COMMISSIONER
THOMAS F. MOORE, JR.
FIRST DEPUTY INDUSTRIAL COMMISSIONER
ABRAHAM H. GOODMAN
DEPUTY INDUSTRIAL COMMISSIONER
LOIS B. HUNTER
DEPUTY INDUSTRIAL COMMISSIONER
EDWARD A. NYEGAARD
DEPUTY INDUSTRIAL COMMISSIONER

NEW YORK, N.Y.

Division of
Industrial Hygiene
and
Safety Standards

February 17, 1950

Dr. Robert A. Kehoe
The Kettering Laboratory
College of Medicine
Eden Avenue
Cincinnati 19, Ohio

Dear Dr. Kehoe:

Many thanks for your letter of February 9th. The information was exactly what we were looking for. We are getting in touch with Mr. Kleiner of Becton, Dickinson & Co., and will make some arrangement with him for obtaining their new lead free tubes. Naturally, we will run the necessary blanks to insure the accuracy of our determinations.

We will be happy to let you know the results of our experience with these tubes.

Cordially yours,

John E. Silson

John E. Silson, M.D.
Senior Industrial Hygiene Physician

JES:DG

KE 0007388

N 7872

February 9, 1950

Dr. John E. Silson,
Senior Industrial Hygiene Physician,
Division of Industrial Hygiene and Safety Standards,
New York Department of Labor,
80 Centre Street,
Albany, New York.

Dear Doctor Silson:

I am very glad to reply as well as I can to your letter of February 2, concerning the means of collecting samples of blood for the determination of lead. As you are probably aware, we have studied the problem of lead concentration in the blood in relation to a sizable number and variety of types of occupational lead exposure. In this connection, I may say, at this time, that we feel quite certain as to the significance of the lead concentrations in the blood, in relation to hazard. I will give you our impressions on this for such use as they may be to you. I should like to point out that we have been making parallel observations, using two highly precise methods of analysis, over a period of some years, and that what I have to say is the result of the systematic application of these methods, with due recognition of the magnitude of the analytical errors of the methods. The range of normal values in the blood can now be stated with utter precision, in terms of the methods available at this time, as ranging from something under 0.01 mg. of lead per hundred grams of whole blood up to and including 0.05, or occasionally 0.055, mg. per hundred grams of whole blood. The experimental error of either method which we use is such that an occasional value as high as 0.06 may be obtained in the case of an apparently normal individual with no known occupational lead exposure. Values in excess of this, however, are an expression of unusual lead exposure, whether occupational or non-occupational. When the results obtained on the blood of an individual or of an occupational group are consistently above these normal values, one may assume that there has been occupational lead exposure. I should point out also that the mean value for the blood findings on a normal individual, as the result of repeated observations, or on a group of normal individuals, is slightly less than 0.03 mg. per hundred grams. Therefore, when the results of a series of observations on a single individual, or on a group of individuals, yields a mean value which is statistically different from the figure 0.03, then one is dealing with an abnormal group. In our experience, ^{when} results above 0.07 are obtained consistently on an individual, or ^{are} obtained as the average or mean result on a group under study, then the occupational exposure is of the potentially hazardous type, and should be regarded with some suspicion. On the other hand, signs and symptoms of lead

KE 0007389

N 7872.01

Dr. John E. Silson - (2) - February 9, 1950

intoxication do not appear, with any degree of frequency or severity, in an individual or in groups of individuals, until the figure of 0.08 mg. per hundred grams of whole blood has been reached or exceeded. The values range far above these, and may be as high as 0.4, 0.5, or even 0.8 mg. per hundred grams. There is no level of lead concentration in the blood which is certainly associated with signs or symptoms of illness, but the higher values among groups of industrial workmen are associated with a higher incidence and more severe forms of lead intoxication.

With reference to your specific question, we have worked with the B and D people on their vacutainer tubes, from the time they first had the idea of producing these for use. The tubes first made available were rather badly contaminated, and following their methods of cleaning, they were not greatly improved. Nevertheless, the equipment itself is quite satisfactory, and when this equipment became available in suitable quantity, we began to make use of it. However, for the past two years, we have found it necessary to clean the tubes ourselves and to re-evacuate them, before making use of them in our own work. Even so we have considered it desirable to obtain duplicate samples of blood for analysis by parallel methods, not only to check the analyses but also to check the possibility of the occasional contamination of the tube. We still regard this as good practice and we intend to continue with it in our investigative work and in all medico-legal cases. Recently the B and D people have sent us a set of tubes for testing, following their use of a new, and a believed, satisfactory, method of cleaning. On an analytical study of these tubes we found them to be quite as satisfactory as those we had cleaned ourselves. We have issued a brief report on the subject, which we have made available to the B and D people over our signature, in order that they might be able to substantiate the satisfactory quality of the method. For ourselves we are quite willing to make use of tubes which they supply us after cleaning by their present and new method of cleaning. We will continue to make parallel observations on duplicate samples, since there is no method of cleaning these tubes that will give complete assurance against an occasional contamination. I would suggest, for your purposes, that you get in touch with the gentleman with whom we have had dealings in this matter (name and address below), that you tell him of your problem and that you arrange to be supplied with tubes that are guaranteed to have been cleaned by the newer method. I have no doubt they have tubes in stock that would not be as satisfactory, but it seems to us that if you obtain tubes cleaned in the new manner that you will obtain satisfactory results. If you do not think this will answer your problem, or if for any reason you still wish to clean your own tubes, I shall ask Mr. Cholak to provide me a description of the methods which we have used for this purpose. We are anxious, ourselves, to get away from this necessity, since it is a nuisance. We will keep an eye on the results of the use of tubes as supplied to us, and if we decide that they are not good enough, we will

KE 0007390

Dr. John E. Silson - (3) - February 9, 1950

resume our previous procedure. On the other hand, there is no question in my mind as to the desirability of the use of a technique and equipment that is similar to that issued by these people. If the tubes are clean, and if the samples are obtained properly, the opportunities for contamination are negligible.

Cordially yours,

Robert A. Kehoe, M. D.

RAK ef

Mr. Joseph J. Kleiner,
Becton, Dickinson and Company,
Rutherford, New Jersey.

KE 0007331



STATE OF NEW YORK
DEPARTMENT OF LABOR

ALBANY

NEW YORK OFFICE 80 CENTRE STREET

EDWARD CORSI
INDUSTRIAL COMMISSIONER
THOMAS F. MOORE, JR.
FIRST DEPUTY INDUSTRIAL COMMISSIONER
ABRAHAM H. GOODMAN
DEPUTY INDUSTRIAL COMMISSIONER
LOIS B. HUNTER
DEPUTY INDUSTRIAL COMMISSIONER
EDWARD A. NYEGAARD
DEPUTY INDUSTRIAL COMMISSIONER

February 2, 1950

NEW YORK, N.Y.
Division of
Industrial Hygiene
and
Safety Standards

Dr. Robert Kehoe
Kettering Laboratories
University of Cincinnati Medical College
Cincinnati, Ohio

Dear Doctor Kehoe:

At Dr. Mayers' suggestion, I am writing you for some information on the technique of collecting blood for determination of lead concentrations. We are planning to do a fairly intensive study of the various techniques for the determination of early signs of lead intoxication in workers, and are interested in obtaining a blood lead value in addition to the other data.

Since our study will require collection of several specimens of venous blood for different tests, we were planning to use Becton-Dickinson vacutainer tubes for their collection. Our laboratory has run a few preliminary tests on these tubes which indicate that they are not entirely lead free. We know of at least one plant, however, which has been using these tubes by breaking the vacuum, cleaning the glass and stopper, and re-establishing the vacuum.

Because of your extensive experience in the collection and analysis of biological materials for lead, we wonder whether you could advise us on the following points:

- 1) What method do you find most reliable and convenient for the collection of bloods for lead determination.
- 2) Have you had any information or personal experience on the use of vacutainers for this purpose.
- 3) If so, what method do you recommend for cleaning them.

We will be grateful for any information you might be able to supply us with along these lines.

Sincerely yours,

John E. Silson
John E. Silson, M.D.
Industrial Hygiene Physician

KE 0007392