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DOCUMENT DESCRIPTION: Letter to Dr. Gardner from Union Carbide Co. RE
Proposed Study of the Relation between Incidence of Pneumonia and Exposure
to Dusts Containing Manganese Dioxide

Union Carbide Company

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March 3, 1938

Dr. LeRoy H. Gardner
Box 551
Saranac Lake, N. Y.

My dear Doctor Gardner:

Since my recent brief conversation with you I have been giving thought as to an outline of the project which we discussed and I am submitting it herewith. I have previously explained the objective and general scope of the study which we had in mind so would offer the following outline for your consideration or comment. Possibly you feel that some of the details given in this outline are irrelevant to the purposes of our study or you may feel that certain other things should be incorporated in such a study to make it of the greatest value. If this outline conforms to your views and previous estimate a note of confirmation would facilitate our further consideration of this project.

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PROPOSED STUDY OF THE RELATION BETWEEN INCIDENCE OF PNEUMONIA AND EXPOSURE TO DUSTS CONTAINING MANGANESE DIOXIDE.

The theory has been advanced that exposure to and inhalation of dusts containing manganese dioxide tends to produce an increase in the incidence and severity of pneumonic cases among those exposed.

To determine the degree to which this theory may be supported by observation the following study is proposed:

A review of all available literature on the subject.

A study of the incidence of pneumonia in guinea pigs exposed to various dusts as shown in the records of the Saranac Laboratory for two study of Tuberculosis, with special reference to such pneumonias known to be due to pneumococcus infection. This study should show the percentage of animals exposed to the different dusts and which developed pneumonia during such exposure.

Exposure of 100 guinea pigs not less than 3 hours per day, 5 days

51541

Dr. LeRoy U. Gardner

March 3, 1938

per week for a period of not less than 8 months, to a concentration of manganese dust in the air approximating 5 mgms. per 100 cu. liters of air. A similar exposure of 100 guinea pigs to a concentration of dust approximating 25 mgms. per 100 cu. liters of air, such dust to be obtained through the use of so-called 200-mesh milled ore containing manganese dioxide in known percentage. The maintenance of 100 guinea pigs as a control group for comparison with the above groups.

All guinea pigs dying during the period of exposure to be examined for possible presence of pneumonia and those showing such a condition to be checked for the presence or absence of pneumococcus in connection with their conditions.

Observations to be made at suitable intervals, approximately 1 month, of:

Weight changes

Fertility

Blood (total red count; differential white count)

Urine (specific gravity; sugar; albumin)

If no animals have died within the month then monthly one or two from each group shall be sacrificed to determine gross pathology present. A sample of lung tissue shall be examined microscopically and if there is evidence of gross pathology in any other organs, microscopic examination of such organs shall be made.

At the end of the period of exposure a group of 10 to 20 animals from each concentration shall be kept for a period of 1 to 2 months in which time they shall be examined to determine to what extent manganese in the lung may be eliminated after the exposure has ceased or to what extent the lung has recovered from damage, if any, noted because of the exposure.

Except for the recovery groups just mentioned all animals at the end of the exposure period, shall be killed and examined for gross pathological changes. (Any) organs showing (such changes) shall be examined microscopically. An adequate number of samples of lung tissue shall be examined microscopically to determine what changes may have occurred as a result of the exposure to the dust containing manganese dioxide. A determination should also be made in a few animals to show the amount of manganese dioxide present in the lungs of exposed animals for comparison with the similar determination in animals held for recovery period following the exposure to the dust.

Brief monthly progress reports would be requested by the company and also permission to observe the progress of experiments at such time as might be desired.

It is understood that in connection with this study there will be no experimental human exposures and that the personnel to be engaged in this project shall not have the status of employees of the sponsor company and that they shall not be so regarded for any purpose under any state or federal law and that accordingly such company shall be held harmless from any and all claims on the part of such personnel for any cause or reason whatsoever arising out of and in connection with this study.

51542

Dr. LeRoy U. Gardner

March 3, 1938

If the contribution required by the sponsor company for the support of this study as originally estimated is insufficient for its completion the company shall be under no obligation to make additional contribution unless it shall be duly notified as to the need for such further expense and agrees thereto.

If it is found practical for the company considering the sponsorship of this study to support the above outlined project, full discretion would be granted as to the publication of the results as an objective study by the company but it reserves the right to review the manuscript of such a report prior to publication and to determine, if at all, in what manner the name of the sponsor company or any of its affiliates might be used in connection with such publication. The company would also wish to advise as to the publication in which the report shall appear and the time of issue.

If after the receipt of the present estimate of the expense to the company for the above study it is decided to undertake same, then the understanding between the Laboratory and the company will be embodied in the form of a properly executed agreement, neither party to have any obligations in this connection until such agreement is executed.

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I trust that the above outline states our problem as originally described to you and that if we take favorable action on sponsoring the study you would find it possible to start the necessary preparations reasonably soon. Weather conditions here are moderating but I do not know how you might be fixed with regard to your construction of the necessary quarters at this time in Saranac Lake. How long after starting do you believe it might take to complete such a study?

On looking up some of my records I find that the concentration of dust in our mill room in 1925, when we were having some difficulty in keeping it under control, varied from 3.84 mgms. per 100 cu. liters to 4.9 mgms. per 100 cu. liters. This has since been greatly reduced, but I do not have recent figures. I have mentioned one concentration of approximately 5 mgms. as representative of certain working conditions but believe we should have observations made also on a much higher concentration of dust such as could be present in many shops where no adequate provision has been made for dust control.

If it is decided to go ahead with this study we can, of course, furnish all the 200-mesh milled manganese ore which you would require. As I recall it, the African ore, which we would now have available, carries some 80-85% manganese dioxide. We would, of course, be able to furnish you with an analysis of the material supplied at the time of any experimental work.

Very truly yours,

A. G. Cranch

INDUSTRIAL TOXICOLOGY DEPARTMENT

A. G. Cranch, M. D.

gk

P. S. I am going to Cleveland the end of this week and will not be in the office again until March 11th.

51543