FILE NAME: Industrial Hygiene Foundation (IHF)

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(412) 687-2100

INDUSTRIAL HEALTH FOUNDATION, INC.

5231 CENTRE AVENUE PITTSBURGH, PA. 15232

March 24, 1971

TO: Sponsors of IHF Fibrous Dust Study

Mr. Hugh M. Jackson, Johns-Manville Corporation
Dr. Lee B. Grant, PPG Industries
Mr. Russell Brittingham, Pittsburgh Corning Corporation
Dr. Joseph L. Goodman, Raybestos-Manhattan, Inc.

Attached is a copy of the report on the IHF Fibrous Dusts Study which will appear in the Foundation's 1970 Annual Report.

Please let us know immediately if you should have any objections to the text of this report or to the inclusion of your company's name as sponsor.

Absence of a reply by April 2 will indicate approval.

Thank you.

Sincerely yours,

(Mrs.) Sally Carlysle
Office Manager

Encl.

May 11, 1970

Dr. Joseph L. Goodman
Medical Director for Research
Raybestos-Manhattan, Inc.
North Charleston, South Carolina 29406

Dear Joe:

IHF's research on "Fibrous dusts in lungs of urban and rural dwellers" has been funded by the U. S. Public Health Service, and we are now only awaiting completion of industry's portion of the funding to proceed. So far, IHF's studies of fibrous dusts have required approximately half million dollars and projects involving asbestos now under way or proposed will require a similar amount. It is comforting to know of your willingness to recommend that your company continue to support our studies at the same rate as in the past. By participating in this way, we will continue to extend to your company the benefits of sponsorship, including advanced notification of publications and an opportunity to share in research planning. Copies of our reprint from the Archives of Environmental Health (enclosure) which appeared last month will be forwarded when received. Please advise how many copies you would like to receive. Additional copies of the Fibrous Dust Seminar Proceedings can also be made available to you upon request. From all of the above, I hope you can prepare a critique for your own company's use. If we may be of any further assistance, please advise.

Incidentally, for your personal use, I am including a copy of our progress report to the U. S. Public Health Service on "Asbestos Dusts: Their Pathogenic Components." It should not be reproduced without getting our permission in advance as it is not for general consumption.

In addition, I am sending a draft of the summaries of IHF projects which will be included in the 1969 Annual Report. If you wish extra copies of the Annual Report when it becomes available later this month, please advise and they will be provided, without charge, of course.

With best regards.

Sincerely,

deTsjc
Enclosures

Robert T. P. deTreville, M. D.
President

bcc: Mr. H. M. Bowman

4. Chemically-treated asbestos dust.

Six gram portions of each type of asbestos were ball-milled for two hours. Each batch of asbestos dust was covered with aqua regia at room temperature for one hour. The proportion of aqua regia to asbestos was 250 ml. per gram. The dust was then transferred to Buchner's funnels and washed with distilled water until free of acid. A two per cent solution of EDTA in 1 Molar potassium hydroxide was prepared and each asbestos preparation was suspended in this solution for one hour and then washed with distilled water in Buchner's funnels. After drying, these preparations were Spex-milled for 3 to 15 minutes following which standard suspensions were made of each.

5. Chemically- and heat-treated asbestos dust.

Batches of each of the three types of asbestos were treated chemically as described under 4. After drying, these batches were Spex-milled for 3 to 15 minutes, the time depending on the microscopic appearance of samples examined at frequent intervals. These batches were then heated in the electric furnace as described under 3 and standard suspensions made.

B. Intratracheal Injections.

All intratracheal injections were performed under light ether anesthesia with the aid of an illuminated self-retaining laryngeal speculum which allowed visualization of the vocal chords. This enabled the operator to pass a long 18 gauge needle with rounded end attached to a tuberculin syringe between the vocal chords and inject the desired amount of dust suspension into the trachea. The rats were injected with 1 ml. of dust suspension.

C. Intrapleural Injections.

These injections were made with a short-bevelled 22 gauge needle, 4 mm. long and attached to a tuberculin syringe. All animals were injected while under light ether anesthesia in the right midaxillary line, in the region of the 5th interspace. Rats were injected with 50 mg. asbestos suspended in 1 ml distilled water; and hamsters, with 25 mg. asbestos suspended in 0.5 ml. water.

RESULTS

General

No significant difficulty was experienced with animals receiving intrapleural injections. In contrast, the intratracheal injections proved highly lethal when doses of 7 mg. or higher were employed. Inasmuch as we had observed the development of lung cancer in rats receiving in the neighborhood of 14 to 21 mg. chrysotile dust, we aimed for a total dosage of 21 mg. asbestos dust. Because of the very high lethality of our dust preparations, it became necessary to

Table 1

Tabular Protocol of Rats
Injected Intratracheally with Dusts

Dust	Fiber Diameter (microns)	No. Rats	Dose	Mortality (i)
icroquartz (a)	1.2	62	25 mg	26% in 6 months 45% in 15 months
atural Chrysotile (b)	0.05 - 0.2 0.2 - 1	55	10.5 mg + 14 mg	90% in 18 months 100% in 24 months
alc (tremolite) (c)	0.1 - 0.2	50	25 mg	40% in 6 months 44% in 6 months
ynthetic Chrysotile (d)	0.02 - 0.04	55	14 mg + 45 mg	22% in 12 months 53% in 24 months
eramic Aluminum Silicate (e)	2.0	80	10.5 mg	72% in 18 months 85% in 18 months
lass (f)	1	75	10.5 mg	67% in 12 months 100% in 18 months
rucite	2 - 3	15	10.5 mg	47% in 12 months 73% in 24 months
ilicon Carbide (g)	0.5 - 3.0	22	3.5 mg	18 rats sacrificed at intervals (no deaths in 6 months)
morphous Magnesium Silicate (h)		10	75 mg	10% in 6 months

a. High nickel, 35 rats; medium nickel, 31 rats; and low nickel, 27 rats
b. Ball-milled dust given to 40 rats and hammer-milled dust to 15 rats
c. Talc with high and low natural nickel content (given to 25 rats each)
d. One batch prepared at Mellon Institute, the other at Johns-Manville Research and Engineering Center
e. Named Fiberfrax, obtained from Carborundum Company
f. Groups of 15 rats given different kinds of fibrous glass: 1, etched glass; 2, uncoated; 1, coated with starch binder; 1, coated with resin
g. Silicon carbide whiskers from Carborundum Company
h. Prepared by reacting sodium silicate with $MgCl_2$ and washing precipitate
i. Range of mortality in months of different groups

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