FILE NAME: Owens Illinois (OWILL)

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Analysis: Owens-Illinois/Saranac Kaylo Documents

O-I.

1 - Letter 11-16-48 Vorwald to U. E. Bowes

Sends three copies of 1948 interim report (1A)

Says this report is final as to tests on uninfected animals but final report on infected animals (T.B.) will come later.

Says that in the 30-36 month period the tentative conclusion of no harmful effect has to be revised.

"In all animals sacrificed after more than thirty months of exposure to Kaylo dust, unmistakable evidence of asbestosis has developed showing that Kaylo on inhalation is capable of producing asbestosis and must be regarded as a potentially hazardous material." However, neither the quartz nor the diatomaceous earth produced problems. "I realize that our findings regarding Kaylo are less favorable than anticipated. However, since Kaylo is capable of producing asbestosis, it is better to discover it now in animals rather than later in industrial workers. Thus, the company, being forwarned, will be in a better position to institute adequate control measures for safeguarding exposed employees and protecting its own interests."

1A - Interim Report on Kaylo 10-30-48 by Vorwald, Pratt, Durkan, and Delahant

This is final report on three years exposure of uninfected animals to Kaylo. "Previous experience has shown that this (3 years) is the required period over which exposures to a dust of doubtful biological activity must be continued before final conclusions are warranted."

"It will be shown below that Kaylo is capable, on prolonged inhalation, of producing asbestosis in the lungs of guinea pigs, and that it should be handled industrially as a hazardous dust."

Final observations - normal guinea pigs:

3 yrs., 45 hours exposure to an average of 116 mppcf.

In 30 months, there was no fibrosis.

9 animals killed after 30 months have shown "true fibrosis of a type characteristic of the response of pigs to asbestos"

"This condition is identical with asbestosis."

As the period of exposure became longer, the asbestos value gradually increased.

Discussion

"The final observations...prove that Kaylo is capable of producing ... asbestosis." Thus, the asbestos in Kaylo is unaltered during manufacture and "maintains its capacity to cause fibrosis."

Explains that the 30 months result showed preliminary asbestosis development which was masked by the other inert dust. In retrospect the doctor re-evaluated the 30 months conclusions and found incipient asbestosis.

Describes the modification effect of inert Kaylo constituents on the asbestos in Kaylo and compares to the same effect in silicosis.

Says the calcium silicate component in Kaylo is probably inert.

Refers to Gardner's earlier studies and Gardner's concern that Kaylo might cause asbestosis and silicosis at the same time and says it does not.

Requests that ensuing discussion of asbestosis not be disseminated as it was sponsored by other companies but that the information may aid the O-I health dept. "in formulating a safety program which certainly is necessary in view of the results of this Kaylo experiment."

Refers to short v. long fiber experiments and conclusion that "very small numbers of fibers are capable of producing asbestosis although the development of lesions is delayed. The present experiment with Kaylo is also an example of this fact."

Says Kaylo may exert slightly more T.B. effect than pure asbestos.

Conclusions

1. "Kaylo because of its content of an appreciable amount of fibrous chrysotile is capable of producing asbestosis and should be handled as a hazardous industrial dust."

O-I.

2. Letter 12-12-50 Hazard (O-I) to Vorwald

Says O-I Kaylo Division wants to "gather together in brochure form material on the health aspects of Kaylo dust and wants to consider the possibility of publishing some of your experimental findings."

Refers to visit by he and Dr. Shook to Saranac and their desire to obtain final report.

Urges a field examination of Kaylo Sayerville, New Jersey, operation.

O-I.

3. Final Kaylo report 1-30-52

Refers to fact that in 1943 O-I had developed Kaylo to pilot plant stage and that Kaylo "could be used as a thermal insulating material." The product was prepared" by heating under steam pressure a suspension of calcium hydroxide, silica, and asbestos to form a hydrated calcium silicate." Refers to content also of asbestos and free silica. "Before Kaylo was used commercially on a large scale, it was important to determine whether or not any dust liberated from this product during manufacture, handling, or fabrication would be likely to constitute a respiratory hazard to exposed individuals."

Tests started in 1945.

Obtained Kaylo from the dust collectors of Berlin, N. J., plant.

One sample contained chrysotile and amosite but the others contained only chrysotile but says both kinds cause asbestosis.

In respect to the rats exposed to Kaylo for 18 months, asbestosis bodies were reported but not fibrosis and Dr. Vorwald commented

that he would not have expected to see fibrosis in just 18 months.

As to hamsters, one animal had slight asbestosis (18 months).

The asbestosis in guinea pigs (36 months) was extensive.

[Report restates the findings on pigs reflected on O-I 1A]

Findings

"Kaylo dust when inhaled by pigs for a prolonged period (30-36 months) is capable of producing the peribronchiolar fibrosis characteristic of asbestosis."

O-I.

4. Report of Industrial Hygiene Survey of O-I Sayreville plant (5-29-51)

a. Impinger used at 7 locations but also attempted to evaluate asbestos and silica especially.

b. Describes admixture of the final product and the potentially hazardous constituents

Finds 5-20% of sample was chrysotile

[Kaylo had two uses (1) light grade material = thermal insulation

(2) heavy grade = fire buck and fire doors

c. Table p. 3 reports the dust counts in two values more than 100 and less than 100
(per prior Saranac findings)

[Where asbestos was in the air, the TLV was exceeded in 4 operations]

At p. 3 refers to "the hazardous fraction of the dust" and this is indicative of recognition that the ACGIH-TLV counted all dust particles and not just asbestos.

Tables on p. 4 reflect the asbestos per cent of the total dust samples obtained.

d. Lauds O-I for good general dust control - reports, however, that where asbestos constitutes a large portion of the dust that dust control must be improved.

e. Refers to TLV's of N. J., ACGIH as 5 mppcf and total dust of 50 mppcf.

[Do not confuse ACGIH total dust value with total dust count for asbestos containing air. The 50 mppcf refers to total nuisance dust without toxic substances contained therein. The 5 mppcf value applies if silica or asbestos is contained in the sample. See e.g., Cralley 1969 Johannesburg Conference and Nicholson 1976 TLV article, Schall 1964 NYAS Annals and Dreessen 1938 report]

f. Refers to conditions in boxcar where values approached 50 mppcf by estimate.

g. Makes specific dust recommendations including: dust education; clothing changes; housekeeping; respirators in boxcar; monthly dust counts; x-rays; no guarantee that if TLV is met, no disease will appear.

O-I.

5. Rough draft of Schepers published paper on the Kaylo experiements.

[Schepers has testified that in 1954 O-I asked him to independently review Vorwald's materials and that his findings in this paper were made without the benefit of Vorwald's 1952 report. Schepers evaluation found more disease earlier in all animals including the rats which Vorwald exonerated]

a. Says calcium silicate alone had proved to be inert from past experiences and tests.

Points to potential effect of combining non-toxic substances in a chemical mix.

Describes analysis of end product as being 80% hydrous calcium silicate, less than 15% chrysotile and 1% quartz

Describes 44 hour per week dusting for up to 3 years - dust counts ranged from 100-125 mppcf with average of 115 mppcf.

[Animal studies of short duration must be accelerated over lower lifetime of animal to mirror lifetime of worker. Test also was for T.B. proclivity, the results of which are marginally apposite to these cases.]

b. Uninfected animal

Expresses a presumptive relationship between early but progressive infectious mortality and the dust.

Finds less a distinction of effect on 3 species of animals than Vorwald in his 1952 report. Says fibrosis was more marked in pigs because of length of exposure and concludes that stage for stage, the rats and hamsters (18 months exposure) suffered the most. Finds that fibrosis was slow prior to conclusion of 30th month but at 33 months, extensive fibrosis occurred. Found asbestos bodies in rats and hamsters after 15 months and in pigs after 18 months. "They (asbestos bodies) were so constantly in association with the areas of fibrosis that the conclusion of a causal relationship between these two phenomena is almost inescapable."

Concludes that the Kaylo "dust alone, except for its chrysotile component, is not fibrogenic though it provides a cellular reaction."

Infected (with T.B. strand)

Animals

Found slight unfavorable influence of dust on the animals.

Discussion

Finds the fibrosis promoted to be of the same kind as has been repeatedly produced at Saranac by exposure to pure asbestos dust.

Says the chrysotile probably caused the T.B. elevation.

O-I.

5A. Tables included with O-I 5.

## Schepers Saranac Analyses

551 - Reprint of Schepers 1955 Kaylo article from 12 AMA Arch. Ind. Health 348-360 (1955)

[See O-I 5 and 5A]

552 - Program for Am. Col. of Cardiology (1956) including lecture by Schepers on Occupational Diseases which affect the heart.

553 - O.C.D. #75 (W. E. Taylor, deceased) by Schepers (1956)
[The OCD series are pneumoconiosis cases referred to Saranac. Schepers has testified he sent copies of all to J-M whether or not they requested same]

Case of asbestosis in a shipyard worker

(a) Letter 10-18-56 from attorney for contractor to Schepers which included dust tables and x-rays and autopsy. Attorney rep'd the last employer. Reports that Ind. Commission made an award based on asbestosis. Poses 2 questions for doctor: (1) Did he contract asbestosis while employed by last employer; (2) Is last employer entitled to contribution from prior employers?

Relates work record:

no dust prior to 1943

1943-46 shipyards as an asbestos worker working in holds of ships, etc. Worked overtime

May, 1946 - Feb., 1948 = no asbestos exposure

Feb., 1948 - April, 1948 asbestos insulator

Oct., 1948 - 3 1/2 months with last employer

Then relates rest of exposure which totals 5 years 6 months.

In 1951, plaintiff was put in cutting room because of exertional dyspnea and exposed to 85% magnesia.

Reports on an experiment which they set up in saw room.

(b) OCD 75 Report

Identifies the dust experiment by Perry done July 7, 1956, and lists dust work history of 5 years 6 months.

p. 2 - dust levels

work room = 4.2 mppcf
power saw = 21 mppcf
10 ft. from saw = 8.2 mppcf
98% of the particles were less than 10n and 2% over

Tracks the progression of disease in the serial films.

Discussion

No question about diagnosis of asbestosis "Not only is there an adequate history of exposure to asbestos containing dust but the radiographic sequence of pulm. changes, the clinical course, and the autopsy ... are all typical of asbestosis."

Concludes from x-ray evidence of asbestosis in 1948 that the "main disease resulted from the earlier exposure." Refers to latency period.

554 - Amasa Pease v. Armstrong Contracting

File includes photos of tissue

11-29-61 letter Dr. Lieb to attorneys

Found cancer of lung, and asbestosis. Says need to search for asbestos bodies

Letter 7-16-62

Schepers to Lieb - describes his prior research on Kaylo, et al. Denegrates recent Am. Cancer Society study on cigarettes for failure to take into account industrial pollutants.

Letter Lieb to attorney suggesting sending autopsy samples to Schepers.

Letter 8-3-62 from attorney to Schepers forwarding the slides.

555 - Schepers Ency. Brit. file

Letter 1-8-59 from Ency. Brit. to Schepers asking him to revise section on pneumoconiosis

Letter 1-22-59 Ency. Brit. to Schepers sending him the current section on pneumo.

Article by Schepers

Lists insulation workers as a group subject to mixed pneumoconioses

Lists asbestos as a carcinogen

556 - Saranac Cancer Prelim. Report

5-7-52 - Interim report on asbestosis and pulmonary cancer

Tests have been run for 14 months. Purpose is to correlate animal data with experience of those occupationally exposed to asbestos dust.

"There appears to be a trend toward a greater incidence of tumors in the exposed animals than in the control animals" Refers to fact that the experiment is not complete but "it is considered likely that if the ratios of tumor incidence at the next period when animals are killed are similar to those for the 14 months interval, the trend which is now noted may finally be shown to be statistically signif. because of the larger total number of animals observed."

Comment

"Experiment is now in its most important phase."

Only a slight change in numbers would have made the statistical difference significant.

1963 - _____

The Pneumoconioses by A. J. Lanza

I. Asbestosis by K. W. Smith

14 - Refers to increase of usage in insulation and building trades.

15 - Fibers can be found in ... pipecovering.

20 - Refers to Schepers text on asbestos (1962) - contrasts this to asbestos workers in U. S. and Canada exposed only to asbestos as a toxicant

Suggests Schepers cases were exposed to asbestos fibers of different types and greater exposure of Schepers cases.

20-1 - Says when asbestos is mixed with other substances you get a diff. x-ray picture and shows an x-ray of mixed dust pneumoconioses.

22-3 - Says that ACGIH TLV measures inert particulate matter as well as asbestos.

24 - Decries changes in exposure of insulators and lumping of them with asbestos workers in the lit.

II. Diatemaceous Earth by K. W. Smith

28 - Says USPHS reported on this substance in 1953-4.

III. Pathology of Asbestosis by Gross

49 - Describes mixed dust problem and admixture of asbestos with other substances.

52 - Refers to sporadic case reports of lung cancer associated with asbestosis in literature and cites Isselbacher Klaus and Hardy (1953) and says they (case reports) have appeared in workers in asbestos textiles or installation of pipe insulation