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BOOK

ASBESTOS:

Medical and Legal Aspects

by Barry I. Castleman

Second Edition

Prentice Hall Law & Business

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Company Knowledge

"I'll never forget, I turned to Mr. Brown, one of the Browns made this crack (that Unarco managers were a bunch of fools for notifying employees who had asbestosis), and I said, 'Mr. Brown, do you mean to tell me you would let them work until they dropped dead?' He said, 'Yes. We save a lot of money that way.'"

Testimony of Charles H. Roemer about the meeting of Unarco officials with Johns-Manville President Louis Brown and his brother, Vandiver, in 1942 or 1943. (Deposition taken April 25, 1984, *Johns-Manville Corp. et al. v. the United States of America*, U.S. Claims Court Civ. No. 465-83C.)

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Much could be said to further acquaint readers unfamiliar with the U.S. judicial system for resolving civil claims. However, this section is focused on the utility of legal discovery as a tool for doing historical research on asbestos disease.

To encourage fair settlement of damage suits, the U.S. legal system allows each side to ask the other questions (Interrogatories) which must be answered in writing under oath. By means of Interrogatories, the plaintiff may verify that a defendant asbestos company manufactured certain products and sold them to the shipyard where the plaintiff worked, for example. The defendants, on the other hand, can fully inquire about the nature of the damages claimed, and about the plaintiff's medical and occupational history—did the man smoke cigarettes, did he work with other carcinogens, who is the treating doctor, and so on. Some questions will be directed toward legal matters: When did the manufacturer begin to put warning labels on his products; how long ago did the plaintiff learn he had asbestosis (i.e., does the statute of limitations prevent the case from being prosecuted)?

The Interrogatories are supplemented by the right of each side to take depositions and examine documents in the other side's possession. This also takes place in advance of the trial. The plaintiff wants to know when and how the manufacturers became aware of the product dangers, and what was the subsequent conduct by each manufacturer. This "actual knowledge" is not ascertainable by merely reading the published literature that may have been *available* to the manufacturer.

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Reports *published* by the manufacturers and their employees cannot be relied upon as complete or valid statements of the firms' internal knowledge.

For the purpose of legal "discovery," as it is called, corporate employees and former employees can be deposed. The deposition is a scheduled questioning session where the person deposed is under oath and every word said is recorded. Statements made in a deposition may then be used in trial, if an out-of-court settlement or dismissal of the case does not intervene. The deponent might be a company executive, medical director, industrial hygienist, or a clerk who has been the custodian of records of interest (and can thus testify that the records are "authentic").

It is not usually difficult to find out who the principal people in the company were who had responsibility for plant and product safety. This can be gleaned from company answers to interrogatories, inquiries to "old timers" in the health and safety field, and sources like the historical publications of the Industrial Health Foundation (previous to 1971, Industrial Hygiene Foundation). The old IHF Transactions list members of numerous committees, and note the companies where these people were employed.

Under the discovery rules, defendants are required to produce the relevant corporate documents upon request. Other persons or institutions, such as research bodies that did contract work for the companies, may also be subjected to discovery proceedings. Concealment of vital evidence can result in the granting of a new trial (if the case was lost by the disadvantaged party) or, even more rarely, in disciplinary action against the offending lawyer by the state licensing authority or the court.

Documentation obtained from sources other than the asbestos companies and their employees is, for the most part, discussed elsewhere in the book. This chapter will attempt to at least note the possible knowledge specific companies had of such information and provide fuller discussion of documentation obtained in discovery from the companies themselves. The role of company doctors will also be noted here.

(For reference to specific companies not included in sections in this chapter, the reader may find the Index helpful).

RAYBESTOS-MANHATTAN, INC
(Renamed "Raymark" in 1982)

This company has been a leading manufacturer of asbestos friction products (brake linings, etc.) and textiles since the 1920s. It has more recently diversified into additional lines of business not involving asbestos.

In Answers to Interrogatories, this company has acknowledged paying compensation for disability from asbestosis to employees since the 1930s. The first employees compensated for "asbestosis-carcinoma" worked at the Manheim, Pennsylvania plant. One of these individuals was paid compensation in 1950 (R. Gelder) and another apparently was compensated before 1946 (K. Hilton, no date given). The company acknowledges paying compensation for mesothelioma to another worker at the same plant, in 1962 (H. Frey).

Raybestos-Manhattan produced what have become the best-known discovery documents in the history of asbestos litigation. These are known as the "Sumner Simpson Papers," Popularly dubbed the "Pentagon Papers of the Asbestos Industry" in news reports, this is the single most revealing cache of corporate documents found in these legal proceedings. The documents are the correspondence and file reports retained by Sumner Simpson, President of the company in the 1930s and 1940s. Many of these documents are discussed in Chapter 3 in greater detail, and the most important documents are letters exchanged with attorney Vandiver Brown of Johns-Manville Corporation.

A measure of the importance of these documents is the decision by South Carolina Circuit Judge James Price to grant a new trial in an asbestos damage suit won by the defendant companies. The after-discovered evidence, as it was called, would likely have led the jury to an opposite verdict—and on this basis a new trial was granted.

Judge Price characterized the documents as follows:

> The correspondence very arguably shows a pattern of denial and disease and attempts at suppression of information which is highly probative.

The correspondence

> reveals written evidence that Raybestos-Manhattan and Johns-Manville exercised an editorial prerogative over the publication of the first study of the asbestos industry which they sponsored in 1935.
>
> (It) further reflects a conscious effort by the industry in the 1930s to downplay, or arguably suppress, the dissemination of information to employees and the public for fear of the promotion of lawsuits.
>
> (Amended Order. *Barnett v. Owens-Corning Fiberglas Corp. et al.*, State of South Carolina, County of Greenville, Court of Common Pleas, Aug. 23, 1978).

Federal Judge Harold Ackerman of New Jersey has agreed to grant plaintiffs trial by jury in negligence, fraud, and conspiracy claims against Metropolitan Life Insurance Company (*Anna Billetz et al. v. Johns-Manville*, Civ. No. 80-2976). The judge found that the study as published by Lanza and co-workers was altered, "apparently in accordance with the asbestos industry's wishes." One of the "most glaring alterations" was the deletion from conclusion 4 of the sentence: "However, it is possible for uncomplicated asbestosis to result fatally."

There are thousands of pages of documentation, but the highlights only are given below:

1. Asbestos Magazine Letters

Sept. 25, 1935	Rossiter to Simpson
Oct. 1, 1935	Simpson to Brown
Oct. 3, 1935	Brown to Simpson
March 23, 1939	Rossiter to Simpson
Nov. 3, 1941	Brown to Simpson

These describe ongoing pattern of non-publication of articles on asbestosis in the trade magazine, *Asbestos*, at the direction of industry executives. (See "The Asbestos Magazine Letters," in Chapter 3, and Appendices 1-2).

2. Editing of the Metropolitan Life study (by Lanza and co-workers)—letters

Dec. 10, 1934	Brown to Lanza
Dec. 15, 1934	Hobart to Brown
Dec. 18, 1934	Brown to Judd
Dec. 21, 1934	Brown to Lanza
Dec. 24, 1934	Brown to Judd
Jan. 2, 1935	Judd to Brown

Key changes asked by Johns-Manville lawyers of Dr. Lanza, in consultation with Judd of R-M. (See "Industry Editing of Medical Publications: Lanza's Surveys," p. 139.)

3. Industry Sponsorship of Saranac Lab Research-letters.

Nov. 10, 1936 Simpson to Schluter—calls meeting of Schluter (Thermoid Rubber Co.), Blagden (Keasbey & Mattison Co.), Lamont (Asbestos Manufacturing Co.), Williams (Russell Manufacturing Co.), and Brown (Johns-Manville).

> The idea of Mr. Brown and myself would have to have four to five (or even more if we could get them) Asbestos manufacturers take over this study by subscribing an equal amount per year, for three years, and then we could determine from time to time after the findings are made, whether we wish any publication or not. My own idea is that it would be a good idea to distribute the information among the medical fraternity, providing it is of the right type and would not injure our companies.

Nov. 20, 1936	Brown to Gardner
Nov. 23, 1936	Gardner to Brown

The asbestos companies authorized commencement of animal studies.
Brown:

> It is our further understanding that the results obtained will be considered the property of those who are advancing the

required funds, who will determine, whether, to what extent, and in what manner they shall be made public. In the event it is deemed desirable that the results be made public, the manuscript of your study will be submitted to us for approval prior to publication.

Gardner agreed to those terms.

Feb. 27, 1937 Brown to Simpson

Lists contributors:

American Brake Block Corp.
Gatke Corp.
Union Asbestos and Rubber Co. (Unarco)
United States Gypsum Co.
Russell Manufacturing Co.
Asbestos Manufacturing Co.
Johns-Manville Corp.
Keasbey & Mattison Co.
Raybestos-Manhattan, Inc.
Thermoid Company
Southern Asbestos Co.

May 3, 1939 Brown to Simpson
May 4, 1939 Simpson to Brown
May 10, 1940 Brown to Simpson

Brown and Simpson expressed alarm that Dr. Gardner had published information on his research in violation of the 1936 funding agreement.

4. Chest X-rays at R-M Plants-letters

Oct. 30, 1936 Lanza to Mitchell
Oct. 31, 1936 Simpson to Jeffords
Nov. 5, 1936 Simpson to Jeffords

R-M President wrote to his general manager in Charleston, S.C. that the Public Health Service can take X-rays on conditions that they not be given to "shyster lawyers" etc. Lanza assured that Public Health Service records are confidential, lauded P.H.S. investigator Sayers.

5. Founding of Air Hygiene Foundation

Jan. 22, 1935 Brown to Judd

Jan. 15, 1935	Memorandum Re: Mellon Institute of Industrial Research Symposium on Dust Problems.
Dec. 4, 1935	Brown to Stover
Dec. 8, 1936	Stover to "Members Asbestos Industry"

Vandiver Brown represented the Asbestos, Cork, and Non-Metallic industries. He and six other representing industries with dust hazards advanced the idea of forming an industry center for research and consultation. This was passed on to Stover, publisher of *Asbestos*, who sent the word out industry-wide:

> I have before me a list of the officers and trustees of the Air Hygiene Foundation, and it certainly is a cross-section of the very finest American industries, insurance companies, chemists, attorneys, and others interested in the prevention of silicosis and the protection of industries from unreasonable claims of workers.

6. Dr. Lynch's Criticisms of the Saranac Research

May 6, 1938	Lynch to Mitchell
May 17, 1938	Simpson to Mitchell
May 18, 1938	Brown to Simpson
May 19, 1938	Gardner to Simpson
May 23, 1938	Simpson to Gardner

Simpson was sent a letter from Dr. Kenneth Lynch concerning the work at Saranac and referred it to Brown. Brown said he thought Lynch was saying that no conclusions could yet be drawn from the Saranac tests. But Gardner responded defensively to Lynch's implication of the questionable value of his animal studies:

> I am of course sorry that he feels that our experiments have no practical bearing on whether there is such a thing as asbestosis... This is a matter of opinion...

Simpson encouraged Gardner:

> I want to say I am pinning my faith on you, and am quite positive it will not be very long before you convince Dr. Lynch that your findings, whatever they be, are correct.

um Re: Mellon Institute of
Research Symposium on Dust

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Members Asbestos Industry"

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7. Northwest Magnesia Association letter

June 14, 1943	DeForest to Morgan
June 18, 1943	Rossiter to Simpson
June 29, 1943	Brown to Simpson

DeForest expressed concern about Washington state standards for workers using insulation to be protected against asbestosis. Also complained that asbestosis was a "foreign disease" and discussion of it could arouse hysteria among insulators. Letter passed on by *Asbestos* magazine to Simpson, and thence to Brown. Brown decided "to let Mr. DeForest learn the facts of life and asbestosis from the State of Washington Department of Labor and Industries."

8. Air Sampling for R-M and Other Members of the Asbestos Textile Institute

May 2, 1944 Cilley to Simpson

Provides record of dust counts in various processes. With a range of 1.7 to 9.9 MPPCF, three of the fourteen values were over 5 MPPCF.

June, 1947. *Report of Preliminary Dust Investigation for Asbestos Textile Institute*. By W.C. Hemeon, Industrial Hygiene Foundation.

Shows continuing occurrence of asbestosis industry-wide, with 20 percent prevalence of asbestosis in two of five plants where employees were regularly examined. Criticizes the 5 MPPCF guideline as requiring additional scrutiny and urges industry-wide investigations.

Raybestos-Manhattan was associated with the Industrial Hygiene Foundation from its start in the late 1930s, and hence received the *Industrial Hygiene Digest* containing abstracts of medical articles on asbestosis. The Sumner Simpson Papers indicate that Simpson was also aware even earlier of articles on asbestosis appearing in "British trade magazines," and he expressed his appreciation that this material was not being reprinted by *Asbestos* magazine in the United States (Oct. 1, 1935 letter to Brown). These letters show that Simpson was familiar with Public Health Service studies on asbestosis in the

1930s. The company was also a member of the Asbestos Textile Institute, whose minutes include reference to discussions about asbestosis and lung cancer starting in the 1940s. (See "Industry Trade Associations and Research Organizations," in Chapter 10).

More recent documentation has also been produced by this company in discovery:

Nov. 7, 1966.—M. Snowcroft (R-M) letter to R.L. Lebel (Bath Iron Works, purchasing agent). Referring to Lebel's concern over asbestos cloth, the writer arranges to have a sample of treated cloth sent in which "the fibers have been coated and brushed so that they will not tend to migrate." Snowcroft also says:

> We feel that the recent unfavorable publicity over the use of asbestos fibers in many different kinds of industries has been a gross exaggeration of the problems. There is no data available to either prove or disprove the dangers of working closely with asbestos.

July 12, 1971.—Snowcroft letter to R.E. Wartham (Newport News Shipbuilding and Drydock Co.).

> You will recall that we were the unsuccessful bidder on your inquiry... because your Pipe Shop reported that our original samples exhibited a higher degree of fiber fall-out according to their test procedures.

Discusses efforts to provide free samples to the customer.

March 7, 1973	I. Weaver memorandum to J. Marsh
Jan. 29, 1974	G.W. Gibbs (McGill Univ.) letter to J. Marsh
March 1, 1974	J.H. Marsh memorandum to P.G. Dolan and four others
March 4, 1974	J.J. Magenheimer memorandum to J. Marsh
March 6, 1974	J. Hawkins memorandum to J. Marsh
June 17, 1974	J.J. Magenheimer memorandum to J. Trainor
July 15, 1974	J.J. Magenheimer memorandum to J. Marsh
July 24, 1974	J. Marsh memorandum to M.Q. Snowcroft

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Discusses studies of asbestos exposures from wearing asbestos "safety clothing," conducted by Gibbs at McGill. Gibbs reported that men wearing asbestos garments at a plant were exposed to average concentrations of more than 5 f/cc and 15-minute peak concentrations above 10 f/cc, in violation of OSHA standards. Various modifications of the fabric were made and suggested, including surface treatment with an adhesive, without apparent success. The last memo by Marsh acknowledges that,

> The McGill study confirms earlier British studies showing that in normal use asbestos safety garments can release concentrations of asbestos fibers in excess of permissible limits.

(Gibbs' findings were published the next year: "Fibre Release from Asbestos Garments," *Ann. Occup. Hyg. 18*:143-149, 1975)

May 5, 1975	J. Marsh memorandum to F.D. Bauce and 7 others
Nov. 24, 1976	J. Marsh memorandum to G. Ferrucci
Feb. 16, 1977	J. Marsh memorandum to M.Q. Snowcroft

The first of these memos from the chief of environmental affairs acknowledges the danger of "high dust levels" in brake repair and the need to assure that warnings reach the small shops. The second, marked "CONFIDENTIAL," notes that, "exposure to excessive levels (of asbestos) for a few months or even a few weeks can result in the appearance of disease many years later." This memo also stresses the importance of preventing workers from taking dust home on their clothes. The last memo advises against telling customers that asbestos products can be used safely. "(W)e cannot use the word safe simply because we do not know what a safe level of exposure is."

Nov. 24, 1976	J. Marsh memorandum to F.S. Daly
Mar. 31, 1978	J. Marsh memorandum to R.B. Sims

These refer to the hazard of surface dust on asbestos-containing friction materials, and the use of caution labels on packages of automatic transmission plates.

July 14, 1978. Plant Manager memorandum to "All RMFM Employees"

Refers to recent televised publicity about asbestos.

> It is important for you to understand that workers in shipyards and on construction sites were exposed to extremely high dust concentrations. In most instances dust control equipment and respiratory protection were not provided and work was frequently carried on in confined spaces which greatly increased the risk. In contrast, in our manufacturing plants you are protected by extensive dust control systems, respiratory equipment, and medical surveillance programs.

Raymark Annual Report 1984.

> Notes that the company had continuously purchased products liability insurance coverage since 1941, totaling $395 million. As of December 31, 1984, $360 million of this amount had still not been used. The company had won suits making its insurers liable for all defense costs until the limits of coverage are exhausted.

This company was also a party to the censorship of all references to cancer in the report of industry-sponsored asbestos research at Saranac, published by Vorwald in 1951 (See Appendix 4).

OWENS-ILLINOIS (O-I)

Animal testing of dust from the insulation product "Kaylo" was initiated at Saranac in 1945, following discussions which took place as commercial introduction of Kaylo was proceeding. Note: Items 1,2,4,5,7,9 and 10 were in the Kaylo file of the old Saranac Laboratory, retained at the Trudeau Institute, Saranac Lake, New York.

1. Feb. 12, 1943 U.E. Bowes (O-I Director of Research) letter to L.U. Gardner (Saranac Laboratory).

> (The health hazard) should be considered from the standpoint of employees working in the plant where the material is made or where it may be sawed to desired dimensions, and also considered from the standpoint of applicators or erectors at the point of use.

orandum to "All RMFM

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2. Mar. 12, 1943 Gardner letter to U.E. Bowes.

   The fact that you are starting with a mixture of quartz and asbestos would certainly suggest that you have all the ingredients for a first class hazard.

3. *Ninth Progress Report On Studies of Kaylo* to Owens Illinois Glass Co. from Arthur D. Little, Inc. (May 16, 1947); including letter of transmittal (p. 1) to U.E. Bowes, same date. From the Introduction:

   Since from a merely sales point of view there may be a resistance towards the inclusion of an organic material in Kaylo, it is assumed that the use of paper pulp is contemplated as a substitute only when and if the amount of suitable asbestos grades available are insufficient. Accordingly, it was endeavored to develop formulae for the incorporation of paper pulp which will not necessitate any change of the present plant procedure, as well as the least possible change in slurry characteristics and batch formulation. It is believed that we have achieved this aim for Kraft pulp as a substitution material, even though we are fully aware of the fact that the final test will reside in pilot plant tests. (p. 3)

4. Nov. 16, 1948. A.J. Vorwald (Saranac) letter to U.E. Bowes on animal (guinea pig) inhalation tests of Kaylo dust.

   In all animals sacrificed after more than 30 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.

   The letter ends,

   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 forewarned, will be in a better position to institute adequate control measures for safeguarding exposed employees and protecting its own interests.

5. Attached to the Nov. 16, 1948 letter was a report, *Interim Report Regarding the Biological Activity of Kaylo Dust* to the Owens-Illinois Glass Company, Toledo, Ohio by A.J. Vorwald, Saranac Laboratory (Oct. 30, 1948).

From the Introduction:

> ...Kaylo is capable, on prolonged inhalation, of producing asbestosis in the lungs of guinea pigs (and) it should be handled industrially as a hazardous dust.

The experimental conditions:

> The animals were exposed to atmospheric suspensions of Kaylo dust for eight hours daily, five and one half days a week throughout the experiment. The dust concentration, which varied somewhat from time to time, has averaged 116 million particles per cubic foot of air over the entire course of the experiment to date.

Results:

> (All) nine animals sacrificed subsequent to thirty months in the present experiment... have developed true fibrosis of a type characteristics of the response of guinea pigs to asbestos.
> While the lesions up to 30 months showed no fibrosis, certain aspects of them were compatible with a preliminary stage in the development of asbestosis. These aspects were masked by the inert type of reaction to the materials other than asbestos in the dust.

Conclusions:

> 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.

Over the next few years, subsequent studies on Kaylo were reported to Owens-Illinois, and the above results were repeatedly referred to in overall summations of the work by Saranac.

6. "New Thermal Insulating Material Combines Light Weight and High Strength." *Materials and Methods* 29:63 (April, 1949).

   "New materials preview" showing a man wearing a respirator using a power saw to cut a block of Kaylo insulation. (Not an advertisement.)

7. Dec. 12, 1950. Willis G. Hazard (industrial hygienist, Owens-Illinois) letter to A.J. Vorwald.

> Some time ago we mentioned to you that our 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.

8. Dec. 9, 1952. C.W. Howard, intra-company corespondence to George White (O-I).

   Attaches draft of proposed pamphlet "on the health aspect of Kaylo," acknowledges the assistance of Mr. Hazard and Dr. Shook as well as "people in Sales." Describing the Saranac experiments, the proposed pamphlet says:

   > (T)here is no danger of developing Asbestosis with normal handling of Kaylo products. Test showed that continued exposure to concentrated Kaylo dust inhaled over a long period of time was capable of producing in animals increased tissue growth typical of Asbestosis. The reaction was milder than what pure asbestos dust would produce.

   General Conclusions:

   > Experience in the factories and field and research findings have proven that normal handling of Kaylo products is safe from a health standpoint. The usual precautionary measures taken for any product containing asbestos are needed in a continued exposure to heavily concentrated Kaylo dust.

   No brochure about Kaylo's health hazards was ever issued by O-I.

Author's Comment (BC):

It is very significant that Dr. Vorwald's guinea pig experiments were not construed *by him* as showing that *any* level of exposure to Kaylo dust was safe for *humans*. Exposure at only one test concentration doesn't even provide dose-response information for the guinea pigs; i.e., perhaps an adverse reaction would have occurred at half the dose tested or less, but there is no way of knowing from the results of experiments at one dose level. Equally important is the impossibility of

quantitatively extrapolating from guinea pigs to humans, given the possibility that humans could be the more susceptible species to the adverse effects of a given concentration of asbestos in air.

9. *Report, Kaylo Division Plant Owens-Illinois Glass Co. Sayreville, New Jersey* by Saranac Laboratory (May 29, 1951).

Total dust counts in various areas of the plant where Kaylo was produced ranged from 2.2 to 8.3 MPPCF—with a high percentage of asbestos and free silica (most samples had an asbestos content in the 10-50% range).

> Although the dust counts of the seven impinger samples were all below 10 million, and therefore relatively low, the rather high quartz or asbestos content of the air-suspended material tended to create in certain areas a condition which might be hazardous, or at least one which approached the maximum allowable limit established by code... Also, the concentration of asbestos dust inside the boxcars probably exceeded safe limits. (estimated concentration of airborne dust in boxcars being loaded with Kaylo material: 50 MPPCF.)

Respirators were recommended for workers loading boxcars. Vorwald advised against reliance on compliance with government and industry standards as complete protection against the threat of occupational disease.

10. Feb. 7, 1952 A.J. Vorwald letter to W.G. Hazard

Encloses final report (Jan. 30, 1952) on *The Capacity of Inhaled Kaylo Dust to Injure the Lung*. Four copies enclosed, and a note that another had gone to Dr. Shook (the Corporate Medical Director of O-I).

> ...Kaylo dust is capable of producing a peribronchiolar fibrosis typical of asbestosis. The dust also has a slightly unfavorable influence upon a tuberculous infection. Although extrapolation from animal to human experience is difficult, nevertheless the results of the study indicate that every precaution should be taken to protect workers against inhaling the dust.

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Vorwald expressed desire to publish the findings, first sending the final manuscript to O-I.

> Reference will be made only to hydrous calcium silicate and not to 'Kaylo'; thus the interest of your company will be safeguarded.

11. E.C. Schuman. "Hydrous Calcium Silicate Heat Insulation." *Petroleum Eng.* C-55 to C-62 (April, 1952). Schuman was Director of Research at O-I. The article generally promoted Kaylo for use in refineries and similar plant applications.

> The story of how this company researched and developed the non-glass insulating material... is an inspiring example of the American Way. Without the vision, resources, and technical know-how of 'big business,' this material would not be on the market today.

Photograph shows insulator sawing a length of molded pipe insulation using a shipping carton as a bench. There is dust on the carton and floor, and the man wears no respirator. The carton reads: Handle With Care. The article comments:

> Applicators appreciate the fact that hydrous calcium silicate is non-toxic and 'easy on the hands.'

12. Deposition of Everett C. Shuman, State College, Pennsylvania, in the *Gilmore* case, Aug. 19, 1980. (attorney for the plaintiff: Conard Metcalf of Boulder, Colorado.)

Mr. Shuman had only recently seen copies of reports to his company from the Saranac Laboratory on the adverse effects of inhaled Kaylo dust. However, he had been told something about the tests by Mr. Hazard in 1952 or 1953. He worked at the company's Berlin, N.J. plant in research and development of calcium silicate thermal insulation, during which time (1944-1949) he was not told of any health hazard from inhaled asbestos.

Owens-Illinois got all of its asbestos from Johns-Manville and had concerns about long-term availability of asbestos raw material.

Explaining his use of the expression, "non-toxic," in the 1952 *Petroleum Engineer* article, Shuman said:

Describes meeting of OCF representatives with Mr. Bartley, a union attorney and consultant, who was interested in the health effects of fiber-glass, particularly respiratory dangers. Mentions a meeting with union representatives in which the low workers' compensation insurance rate for fiber-glass manufacturers was contrasted with the rates for asbestos manufacturers, magnesia manufacturers, etc. At the meeting with Asbestos Workers Union (union of insulation installers) representatives, OCF officials read from Gardner's report on fiber-glass ("These findings may allay any skepticism as to the theoretical hazard involved from the handling of a glass wool..."). This memorandum also discusses meetings at American Industrial Hygiene Association and interest expressed by the National Safety Council in fiber-glass safety.

June 16, 1941. E.C. Ames memorandum to H. Boeschenstein "Investigation of Health Aspects of Fiberglas by Dr. W.J. Siebert."

Discusses research and writing by Dr. Siebert in St. Louis, a pathologist considered reliable by the Asbestos Workers Union. Dr. Siebert questioned Gardner's implication that there was no health hazard because the glass fibers were too large to get into the lungs, and wanted to see Gardner's slides.

1941. OCF brochure featuring a letter from J. Hill (Aetna) saying workers' compensation insurance for fiber-glass was cheaper than coverage for asbestos. etc. (Industrial Health Foundation files)

Sept. 8, 1941. OCF legal and patent department letter ordering government reprints of the asbestos industrial hygiene reports of Page and Bloomfield, Lanza *et al.* from *Public Health Reports.*

Jan. 7, 1942 Ed Ames memorandum to Harold Boeschenstein.

Jan. 7, 1942 Ed Ames memorandum to E.J. Marshall.

These describe a plan to "take the offensive" in 1942, by going to the Asbestos Workers Union with documentation on asbestosis. To further make fiber-glass an attractive alternative to asbestos, OCF considered offering the assurance that product safety was, in effect, "certified," by low-cost product liability coverage purchased by OCF from the insurer, Aetna. (See "The Owens-Corning Fiber-glass Itch Documents" in Chapter 3.)

Dec. 27, 1943. Ed Ames memorandum to C.E. Gregory. "Public Relations Angles in Branch and Division Post War Survey."

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ım to Harold Boeschenstein,
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> In formulating our policy on admixtures with asbestos, we should keep on the alert because otherwise *we will run the risk of smearing Fiberglas with the hazards of exposure to asbestos.*" (original emphasis)

Talks about premium rates charged by insulators to handle fiber-glass, discusses "the itch" as a marketing obstacle.

Nov. 21, 1944. Dr. A.E. Canfield letter to Ed Ames

Nov. 22, 1944 Ed Ames letter to Dr. Canfield.

Undated letter from Dr. Canfield to Ed Ames

Discusses asbestosis in insulation worker Albert Baumgardner.

Dec. 6, 1955. T.S. Rogers memorandum to H. Boeschenstein. "New Health Hazard Research Fine Fibered Fiberglas Products."

Describes Schepers' report of old Saranac studies ("An Experimental Study of the Effects of Glass Wool on Animal Lungs." *Arch. Indust. Health* 12:276-279, 1955) commenting on adverse effects of small-diameter fibrous glass. Memo warns of potential resulting liability and advises that $15,000 is available for a "defensive" research contract.

July 27, 1956. G.W.H. Schepers (Saranac Laboratory) letter to M. Burch (OCF Director of Personnel and Industrial Relations). Informs OCF that fiber-glass does not produce fibrosis of the lungs as asbestos does.

Oct. 11, 1956. W.L. Bowes memorandum to John Black (OCF). "Asbestos Workers Union."

Oct. 16, 1956. J.D. Black memorandum to W.L. Bowes. "Asbestos Workers Union."

Nov. 20, 1956. Ira I. Brought (consultant) letter to M.D. Burch (OCF).

These documents discuss union concerns about occupational lung disease hazards, and OCF officials' fears that fibrous glass may be implicated as a cause.

May 9, 1957. Brought letter to H. Boeschenstein (President of OCF).

Quotes minutes of western states conference of the Asbestos Workers Union, mailed out to thousands of union members. The minutes announced that due to the recognition that "a large number of men" in the trade had definite symptoms and concern that a number of deaths in one local might be job-

related, the international union was "compiling facts and figures on this matter." The diseases asbestosis and silicosis were named and lung ailments were blamed on "fibrous materials."

May 23, 1957. K.S. Johnson (OCF) memorandum to M.D. Burch (OCF). "Asbestosis."

Refers to notice in *Asbestos Worker* that a motion carried at the union's western states conference to "investigate the causes of Asbestosis and allied lung ailments caused by fibrous materials..." Expresses concern that the union may again ask a premium to handle Fiberglas. "I am sure that everyone in our company is conscious of the interest of the Asbestos Workers in the problems of Asbestosis and allied diseases."

1960-1963. Union-Management Committee meetings, monthly, Berlin, N.J. plant.

Frequent and repeated mention is made of excessive dust from mechanical saws in the plant making Kaylo insulation. Almost every month, the union complained about the dust, and various control options were discussed.

Sept. 17, 1963. William A. Lots (OCF, Newark Product Devel. Lab) memorandum to A.J. Pearson, "Health Hazard Kaylo vs. GPL-400."

Acknowledges that asbestos in Kaylo "when breathed into the lungs causes asbestosis which often leads to lung cancer." Notes that "all insulations are dusty and insulators seldom complain except when the dust is particularly irrritating to them."

August 12, 1964. F.H. Edwards memorandum to C.G. Staelin. "Labeling of Asbestos-Containing Products by Johns-Manville Company."

This acknowledges advance notice from Dr. K.W. Smith at Johns-Manville that his company had decided to begin using warning labels on shipping cartons of thermal insulation products containing asbestos.

> The question before us is whether or not Fiberglas' Kaylo should protect itself against more stringent and punitive health laws and the possibility of third party actions by following the J-M lead.

Aug. 8, 1966. F.H. Edwards memorandum to J.M. Briley. "Kaylo Dust—Bath Iron Works."

After noting that Kaylo is 12-18% asbestos, he says:

> Asbestos is recognized as a health hazard causing asbestosis. The threshold limit value set by ACGIH is 5 million particles per cubic foot. However, Dr. Selikoff has stated that only one fiber in the body can cause cancer... At this point, I believe there is reason to question the ACGIH threshold limit... Again, I suggest that we consider the labeling of our Kaylo products in the same general way that J-M labels their Thermobestos...

May 29, 1969. D. Bradshaw memorandum to L. W. Saxby. "Asbestos-Free Insulation."

> It appears that it should be possible to go to non-asbestos insulation systems at about present costs... Let's get rid of asbestos in the insulation industry and we can then get rid of other costly problems which are beginning to develop.

September 21, 1970. J.P. Kern memorandum to Dr. John Konzen. "Asbestos-Labeling."

> Reference is made to your memo of September 15 regarding the warning label that should appear on Kaylo. Are you saying that *we have* to do this now? I naturally would like to delay this requirement as long as possible. Please advise. (original emphasis—entire text of memorandum).

September 25, 1970. J.L. Konzen reply to J.P. Kern. "Asbestos-Labeling."

> From a health standpoint I feel that we should label the product at this time. By copy of this letter I suggest Mr. Logan comment concerning the legal need for such a label. (entire text).

Workers' Compensation Claims Brought by Insulation Workers Against OCF and its Subsidiary Contracting Divisions. OCF was joined as a defendant in claims filed by James Whitcomb Riley (1957), Fred Strickland (1957), E.O. McCarrell (1959), Clifford Harding (1961), John Gronenthal (1961), John Wyss (1962), John

Staples (1962), Paul Greischar (1963), and Robert Goans (1963). (See also "Claims by Insulators Against Contracting Divisions of Asbestos Product Manufacturers," in Chapter 3.)

In addition to these claims, OCF and Johns-Manville were defendants in a claim brought by insulator Dean Templeton. The claim was filed with the Michigan Workmen's Compensation Department in 1960, and a settlement was approved in 1961 (produced in discovery by R.B. Von Wald, Corporate Counsel of Johns-Manville Sales Corp., in 1982).

OCF was also named as a defendant in 1961 in the product liability suit brought against insulation manufacturers by G. Faciane. (See "Lawsuits by Product Users Against Asbestos Manufacturers," in Chapter 3.)

UNARCO
(formerly Union Asbestos & Rubber Company; since 1980, UNR Industries)

This company made "Unibestos" insulation initially at a plant in Cicero, Illinois in 1936. Another Unibestos manufacturing plant was opened in Paterson, New Jersey, in 1941; this was moved to Tyler, Texas in 1954. Unarco also operated a Unibestos manufacturing plant in Bloomington, Illinois, starting 1951. Amosite asbestos from South Africa used by Unarco was supplied by Cape Asbestos.

In 1942 or 1943 officials of Unarco became aware that employees of their firm were developing asbestosis. A meeting was then set up with top executives of Johns-Manville Corporation to discuss the problem and measures taken to deal with it. (See "A Lobster Lunch with Vandiver Brown" and "Saranac Compensation Reviews for Manufacturers" in Chapter 3, and opening quote to this chapter.) Unarco Vice President R.E. Cryor received a report from the Saranac Laboratory in 1948 concerning an employee who had died with moderately advanced asbestosis and lung cancer. Dr. Vorwald at Saranac reviewed other cases for the company around that time (Vorwald patient files P-48-430, P-48-435, P-49-445, and IM-10).

In April, 1950, Unarco's Texas plant was inspected by the Safety and Claims Service, Inc. of Chicago. "The dust hazard there was described as 'serious although an exhaust system is in operation.' Until a satisfactory dust collection system could be installed, the inspection report recommended the use of respirators by all employees in dusty areas." (from "Proposed Findings of Fact" submitted by the U.S. Department of Justice to U.S. District Court Judge William Steger in Civ. No. TY-78-104-CA, *Asbestos Litigation Reporter* June 24, 1983)

In 1952 Unarco paid the widow of a longtime employee compensation, after the man died with asbestosis and intestinal cancer. (See "Cancer" in Chapter 3)

Unarco was one of the sponsors of Dr. Gardner's asbestosis research at the Saranac Laboratory starting in 1937 and was a member of the Asbestos Textile Institute in the 1950s, attending meetings where carcinogenicity of asbestos was discussed. E.A. Hayes, Unarco Personnel Director, attended the Seventh Saranac Symposium in 1952. (See "The Seventh Saranac Symposium" in Chapter 2.) In September, 1952, Unarco sent a number of chest X-ray films of Illinois employees to Saranac for review (in "Proposed Findings of Fact," cited above).

This company was also a party to the censorship of all references to cancer in the report of industry-sponsored asbestos research at Saranac, published by Vorwald in 1951 (See Appendix 4).

PITTSBURGH-CORNING CORPORATION

Pittsburgh-Corning began manufacturing amosite asbestos insulation (Unibestos) after purchasing the business from Union Asbestos and Rubber Company (Unarco) in 1962. The manufacturing plants were in Tyler, Texas, and, starting in 1964, Port Allegany, Pennsylvania.

Previous to acquiring this business, in 1961, Pittsburgh-Corning officials met with Dr. Robert Gaze, chief scientist of Cape Asbestos and seller of the amosite raw material. Dr. Gaze described the manufacturing process and the precautions that ought to be taken to protect employees from the asbestos dust hazard. To further acquaint the Pittsburgh-Corning people with the manufacturing process and engineering controls, Dr.

Gaze arranged to take them for an immediate plant tour. They flew to Canada and observed the plant owned by Holmes Foundry, another customer of Cape Asbestos making amosite asbestos insulation. Dr. Gaze has testified that he consulted with Pittsburgh-Corning "continually" over the next ten years. (Deposition of Richard Gaze, in *H. Yandle et al. v. PPG Industries, Inc. et al.* U.S. Distr. Court. Eastern Dist. Texas, Tyler Div. Civil Action No. TY-74-3-CA, June 4-5, 1975).

Upon its purchase of the Unibestos business, Pittsburgh-Corning turned to the Pittsburgh Plate Glass Company (which, together with Corning Glass, had set up Pittsburgh-Corning as a joint venture in 1937) for information on asbestos hazards. In all, 10 such articles were sent to Pittsburgh-Corning Vice President Karl Baumler by PPG Manager of Plant Safety Clyde C. Ruddick (attached to letters dated May 16 and 25, 1962).

Ronald K. Francis, assistant works manager at the Port Allegany plant, visited the Cape Asbestos manufacturing plant and met the company physician in England in 1965. When he returned to Pennsylvania urgently recommending the installation of engineering dust controls to prevent asbestosis and cancer, he was personally turned down by Pittsburgh-Corning President Russell Brittingham. Brittingham said the plant was already making a poorer return on capital investment than money deposited in a bank (Videotape deposition of R. Francis, in *T.D. Lyons and D. Lyons v. GAF Corp. et al.*, Civ. No. 83-1634, U.S. Dist. Court, W. Dist. of PA, taken in Pittsburgh, Sept. 28, 1983).

In the years 1964 to 1971, Pittsburgh-Corning and Pittsburgh Plate Glass hired industrial hygiene engineering consultant Morton Corn to examine conditions at both the Port Allegany and Tyler plants. In both cases, Corn identified extremely hazardous asbestos exposures and recommended specific engineering control measures (sometimes in combination with the use of respirators). Corn's recommendations were mostly not followed. At Port Allegany, where a ventilation system was eventually installed, no steps were taken to provide an enclosed conveyor to remedy the practice of workers continuously shoveling asbestos scrap from a collection bin. (Depositions of Morton Corn in *H. Yandle et al. v. P.P.G.*

Industries, Inc., et al. Civ. No. TY-74-3-CA, U.S. District Court for Eastern District of Texas, Tyler Div., taken in Washington D.C. Sept. 21, 1976; and *A. Barber et al. v. United States of America* Civ. No. 80-321, U.S. District Court for Western District of Pennsylvania, taken in Baltimore, Dec. 1-2, 1983).

The equipment in the Tyler plant was dismantled and buried following the plant closing. A book was written by *New Yorker* journalist Paul Brodeur about the hazardous conditions in this plant (*Expendable Americans,* Viking Press, 1974). The class action brought by 445 Tyler plant employees was settled out of court for $20 million in 1977. Pittsburgh-Corning paid $8.1 million, Union Asbestos and Rubber Co. paid $1.0 million, Cape Industries paid $5.2 million, and the U.S. government paid $5.7 million. Pittsburgh-Corning had previously made non-asbestos insulations, and was a member of the National Insulation Manufacturers Association during the years 1960–1964.

EAGLE-PICHER INDUSTRIES

Eagle-Picher began producing "Super 66" asbestos-containing insulating cement in 1938. Another product line, "One-Cote Cement," was added in 1950. The company also manufactured asbestos-free, mineral wool insulation products.

As early as 1932, the hazards of asbestos were pointedly noted in a report to the company by the U.S. Bureau of Mines. In a report of lung fibrosis among employees at the company's plant in Joplin, Missouri, where rock wool and asbestos were used, the mixing room was described as "a particularly dusty place." The report continued, "It is now known that asbestos dust is one of the most dangerous dusts to which man is exposed." Dust control was recommended throughout the plant by the author of the report, Dr. F.V. Meriwether (F.V. Meriwether report and letter of transmittal to Dr. R. R. Sayers, March 11, 1932; Bureau Director Scott Turner letter to Erbon Mahon, Safety Engineer, Eagle-Picher Co., Picher, OK, March 21, 1932. U.S. National Archives documents). Glen Christner, who began work for Eagle Picher in 1931 and retired as Vice President of the insulation division in 1963, recalls having

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Co., Picher, OK, March
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931 and retired as Vice
n 1963, recalls having

heard about the early Bureau of Mines report at the plant when it arrived (testimony in *Kitsap Co. Cases of Shroeter, Goldmark, and Bender*, No. 81-2-00669-0, Port Orchard, WA, Nov. 1, 1984).

In 1942, a salesman reported from Texas that health officials had made unfavorable comments about "Supertemp" to a customer, Humble Oil and Refining Company. The salesman, H.M. Aber, also reported that a 1938 article, "Asbestos" (written by Gloyne and Merewether and published in the 1938 *Supplement* to the encyclopedia, *Occupation and Health*, by the International Labor Office) showed asbestos to be more dangerous than mineral wool. Aber communicated a state health official's offer to "make any reasonable test on Supertemp relative to its being injurious to workmen." (H.M. Aber. "Texas State Board of Health." Eagle-Picher Sales Co. Industrial Contact Report, April 8, 1942)

The Research Library of the Eagle-Picher firm accumulated the following documents relating to asbestosis:

Document	Year Received	Comments
Drinker, P. and T. Hatch. *Industrial Dust* New York: McGraw-Hill Book Co., (1936).	1938	section on asbestosis pp. 32-34
Johnstone, R.T. *Occupational Medicine and Industrial Hygiene* St. Louis: C.V. Mosby Co., (1948).	1953	Chapter 30 on asbestosis notes that occupational exposure occurs in the insulation trade
Sax, N.I. *Handbook of Dangerous Materials* New York: Reinhold Publ. Co., (1951).	1951	notes that occupational exposure occurs in insulation work, p. 34

Eagle-Picher was the primary defendant in the product liability case filed by the widow of insulator C. Faciane in 1960. (See "Lawsuits by Product Users Against Asbestos Manufacturers," in Chapter 3.)

Correspondence of officials of the company also dealt with the subject of health hazards of Eagle-Picher insulations.

July 8, 1960 R. Beaudry letter to Eagle Picher Sales Co., and July 21, 1960 reply from Glen Christner (V.P. Insulation Div.).

> Insurance claims adjuster writes that E-P mineral wool products used in 1946–1948 are suspected of contributing to asbestosis in an insulator. Christner reply says products sold in those years contained no asbestos.

April 6, 1965. P.L. Losse letter to R. Alexander (Sun Shipbuilding and Drydock Co. Chester, PA).

> Notes that "minor amounts" of asbestos and other materials were used in the products. "(W)hile each of these added ingredients could be a health hazard if exposure were to a high concentration, such is not the case." After mentioning occasional dermatitis problems, Losse concluded: "In view of the above relative minor hazard potential for the materials we manufacture, we do not have any medical reports relative to this matter."

May 22, 1968. P.K. Maitre letter to F.J. Hess (Shell Oil Co. Wood River, Illinois.)

> The above Eagle-Picher products (Super 66 and One-Cote cements) do not contain any toxic ingredients. Therefore, no antidotes are needed.

In a letter July 20, 1970, Dr. Irving Selikoff urged Eagle-Picher President W. Atteberry to market asbestos cement products in plastic bags to facilitate lower worker exposures by enclosed mixing (as opposed to mixing in open troughs).

Retired Eagle-Picher engineer Herman Lee Huelster has testified that, although asbestos was used in the company's insulating cements from 1942 to 1971, it was never needed. He attributed the use of asbestos to pressures from the company sales department, and characterized this as a "sales gimmick." Huelster had always objected to spending "big money for an ingredient that we did not manufacture ourselves and (which) did nothing to improve the insulating qualities of the product." He attributed the requirement for asbestos in some Naval specifications for insulating cements not to technical purposes, but rather to "clout" of firms with major interests in asbestos (deposition taken Aug. 28, 1980 in *Zsamba v. State*

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Insulation Corp. et al. Superior Court of New Jersey, Middlesex County, No. L-32392-770).

Eagle-Picher was a member of the Industrial Hygiene Foundation during the years 1936–1961, and thus received the *Industrial Hygiene Digest* abstracts on industrial medicine and hygiene. The company was also a member of the National Insulation Manufacturers Association in 1960, when NIMA considered the possibility of a health program and rejected it.

UNITED STATES GYPSUM COMPANY

U.S. Gypsum has manufactured a wide range of building products in which asbestos is used. These include trowel-applied and sprayed acoustical plasters, sprayed insulation, block insulation, ceiling tiles, and paints.

The Company was associated with the Saranac Laboratory from the early 1930s, when tissue samples from employees were examined for pathological effects of gypsum dust. USG was one of the contributors to the series of asbestos experiments started at Saranac in 1937. (See "Raybestos-Manhattan, Inc.," this chapter.) An internal operations bulletin of the company listed substances to which excessive exposure was hazardous, including asbestos (1948). In 1954, a similar company document noted, "Operations involving manual handling of asbestos in any plant shall be considered an area in which employees shall be required to wear adequate respiratory equipment ("Elimination of Dusty Conditions," No. 2-5, Feb. 11, 1954).

Published literature accumulated at the company's research center library in Libertyville, Illinois, includes: *The Pneumokonioses (Silicosis)*, Vol 1 (see "Abstracts," in Chapter 10); the 1938 Public Health Service Bulletin on asbestosis by Dreessen and co-workers; and the text *Industrial Dust* (1954 edition), by Drinker and Hatch, with the British statistics linking asbestosis and cancer of the lung in the chapter on asbestosis.

In 1949, a former employee at a shingle plant of USG died from asbestosis. His son, Ben Miriello, wrote a bitter letter to the company (June 8, 1950) describing his father's suffocating terminal condition and his mother's illness following the death of his father. He enclosed a copy of his father's death

certificate naming asbestosis as the cause of death. In December of 1950, Mr. Miriello wrote again and received a reply (Dec. 27, 1950, signature illegible) acknowledging receipt of both his letters. The reply, from corporate headquarters in Chicago, assured that it was company policy and practice to safeguard the health of employees. Mr. Miriello was invited to visit the Jersey City USG plant where his father had worked in the Thirties and see for himself.

USG manufactured "Spraydon," a spray-applied acoustical plaster, for Sprayon Research Corporation. In 1969, the Sprayon firm applied warning labels because of the asbestos hazard from this product, and in 1970 the product was reformulated to eliminate asbestos. In the meantime, USG continued to manufacture "Audicote," another spray-applied acoustical plaster with asbestos it had sold since the 1950s but which did not carry warning labels until 1973. In that year, this class of products was, in effect, banned by the U.S. Environmental Protection Agency as an air pollution hazard (*Fed. Reg.*, April 6, 1973).

In view of this history, jurors were surprised by USG's sworn Answers to Interrogatories to the effect that the company's first awareness of a relationship between asbestos and asbestosis dated from 1975 (signed by J. Hernan, *Lexington County, South Carolina School District v. U.S. Gypsum*, No. 82-2072-0, trial in April, 1984).

This company was also a party to the censorship of all references to cancer in the report of industry-sponsored asbestos research at Saranac, published by Vorwald in 1951 (See Appendix 4).

SOUTHERN TEXTILE CORPORATION
(Southern Asbestos, H.K. Porter, Thermoid)

The original Southern Asbestos Company was incorporated in 1927 in Charlotte, N.C. A manufacturer in Charleston, S.C., Thermoid Corporation, purchased the fixed assets of Southern Asbestos in 1941. H.K. Porter Company acquired Thermoid Corporation by merger in 1958. A few years earlier (1954), Porter had acquired the Laclede Christy Works in St. Louis, where high-temperature iinsulating cements and blocks were made. In the early 1960s, Porter also took over Carolina

Asbestos Company and Russell Manufacturing Company. H.K. Porter formed a subsidiary, Southern Asbestos Company, in 1974, and this was renamed Southern Textile Corporation in 1979. (Thomas H. Hart, III, Blatt and Fales, Barnwell, S.C.)

Southern Asbestos was the object of an exposé in the *Philadelphia Record* in 1935. (See "Newspaper Articles," Chapter 10.) Thermoid Corporation and Southern Asbestos were two of the original industrial sponsors of Dr. Gardner's asbestos experiments at Saranac. "Many" of the asbestotics described in Shull's report ("Asbestosis: A Roentgenologic Review of 71 Cases," *Radiology* 27:279-292, 1936) were Southern employees (G. Fabel, President of Southern Asbestos, letter to Sumner Simpson, Raybestos-Manhattan, Dec. 18, 1936). The company was also an active member of the Asbestos Textile Institute starting in the mid-1940s. (See "Industry Trade Associations and Research Organizations," in Chapter 10.)

Dr. O.A. Sander was the medical consultant representing Southern Asbestos Company at the Oct. 6, 1954 meeting of the Asbestos Textile Institute at which Dr. Schepers presented a review of the literature on asbestos and cancer. Sander also authored a report in which "moderately well developed asbestosis" was described in a plumber's helper. The man's work history involved less than 10 years of this work, sawing pipe coverings, "usually in confined basement rooms." But the emphasis of this presentation was that doctors should be careful to not scare workers, producing "doctor-induced disability." ("Asbestosis as Differentiated from Other Pneumoconioses." *Arch. Indust. Health* 12:208-211, 1955.) In an article for surgeons, Sander reported:

> The pessimism of the past is being replaced by the realization that a diagnosis of silicosis or asbestosis is compatible with good health and a feeling of well-being. ("Silicosis and Asbestosis." *Amer. J. Surg.* 90:115-119, 1955.)

Shortly after H.K. Porter acquired Thermoid Company, the manager of the Thermoid plant in Charleston, S.C. published an article about their historic problem with asbestosis and efforts in dust control (J. Mitchell, "Health Progress in an Asbestos Textile Works," *Arch. Environ. Health* 3:37-41, 1961). Conditions in 1936 and 1960 were compared, including nar-

rative descriptions and dust counts for both periods. The 1936 figures were all in the 45-210 MPPCF range, and the 1960 ones were all less than 5 MPPCF. (See also "Asbestos Air Pollution in the Community" in Chapter 7.)

Documents obtained in discovery describe reactions at the time of the New York Academy of Sciences conference on asbestos in 1964.

Nov. 6, 1964. John A. Brown (President, Asbestos Textile Institute) letter to J.T. Griffis (H.K. Porter Company).

> I am attaching three copies of news releases A, B, and C which were supposed to have been released to the press during the conference on the Biological Effects of Asbestos at the Waldorf Astoria several weeks ago. Fortunately, due to the alertness of Mr. Edward Shuman of J-M and Mr. Robert Cryor, of North American Asbestos Company, these releases were discovered before their release, and the resultant objections that arose in the meeting, because of the sensationalism of the material held up their issuance...
>
> I also feel that this subject should not be brought to the attention of other than management of our several companies, as any discussion on this situation by sales personnel with users of our products could possibly aggravate the situation and result in individual opinions which could be damaging.

Nov. 4, 1964. Dr. Hillis L. Seay (chest physician and plant physician to H.K. Porter in Huntersville, N.C.) letter to J.T. Griffis.

> Notes that Seay had attended the international conference on asbestos disease at the request of H.K. Porter Company. This 4-page report includes findings, quotes from presentations, and recommendations.

Thermoid was also a party to the censorship of all reference to cancer in the report of industry-sponsored asbestos research at Saranac, published by Vorwald in 1951 (See Appendix 4).

KEENE CORPORATION
(Ehret Magnesia, Baldwin-Hill, Baldwin-Ehret-Hill)

Insulation manufacturers Ehret Magnesia and Baldwin-Hill merged to form Baldwin-Ehret-Hill, which in turn was taken over by Keene Corporation in 1968.

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zine on the inside back cover. In the March issue, there was also an article on pulmonary asbestosis. The company hired a sales clerk in 1936 named Dwight Satterthwaite, and within one month he learned that asbestos was a dangerous dust (Deposition of D.L. Satterthwaite, *In Re: All Asbestos Cases*, C.P. 77-1, U.S. Dist. Court E. Dist. VA, Aug. 29, 1983).

In 1952, Ehret Magnesia hired chemist John D. McAllister, who had worked for Owens-Illinois, to develop a calcium silicate insulation product. Employees in the pilot plant set up in the 1950s were required to wear respirators, and dust control equipment was used in the process. When the process was expanded and a commercial scale plant built, McAllister examined respirators on the market and bought enough to make them available plant-wide. Around this time, the company's insurer conducted air sampling in the plant. In the late 1950s, McAllister recalls that there was considerable discussion over the deaths of three Ehret workers from lung cancer and nonmalignant lung conditions (Deposition of J.D. McAllister, same case as Satterthwaite deposition).

Baldwin-Hill patents in the 1950s stressed that insulations whose use entailed "a minimum of dusting" would have "practically no industrial health hazard. These patents also demonstrated that mineral wool could be used instead of asbestos (Patent No. 2,633,433, granted in 1953; and No. 2,732,295, granted in 1956).

Ehret Magnesia was a member of the Magnesia Insulation Manufacturers Association in the 1950s, and Baldwin-Ehret-Hill belonged to the National Insulation Manufacturers Association in the 1960s.

UNION CARBIDE CORPORATION

Union Carbide operated chrysotile asbestos mines in California from 1963 until 1985. So-called "Calidria" asbestos is short grade fiber, and has been used as a filler, reinforcing agent, opacifier, and thickening agent in such products as drywall patching compounds, plastics, and paints.

One country where sales resistance was soon encountered was the United Kingdom. Media stories and anticipated pressures from unions and government inspectors prompted "over

20 potential customers" to request assurance that Carbide's material would not endanger their employees. Dockers were refusing to handle imported sacks of asbestos in London and Liverpool.

Union Carbide's New York headquarters issued at least two internal communications on asbestos hazards in 1966. A rather thorough 19-page report was then prepared by I.C. Sayers of the Alloys Division of Union Carbide U.K. Limited (*Asbestos as a Health Hazard in the United Kingdom*, 1967). This last report was located at the library of the Quebec Asbestos Mining Association in Montreal (now called Asbestos Institute; document no. 3095), where the index card on it read, "Confidential—not circulated."

Sayers' review describes the 1965 mesothelioma epidemiology study of Newhouse and Thompson. It has separate sections on asbestosis, lung cancer, and mesothelioma. Mesothelioma is described as the "most disturbing" effect because it could occur after only brief exposure. The 1938 TLV of 5 MPPCF is described as an arbitrary choice having no experimental foundation. "There is a growing feeling that the quoted 'Threshold Limit Value' is no longer tenable." In a section entitled "Moral Issues" the report states:

> On the basis of present evidence we are not entitled under any circumstances to state that our material is not a health hazard. What is more, if it is believed that a potential customer would use our material 'dangerously,' and that he is unaware of the toxicity question, then it must surely be our duty to caution him and point out means whereby he can hold the asbestos air float concentration to a minimum.

Union Carbide sacks of asbestos did not bear warning labels until late 1971 or 1972.

On August 15, 1975, Dr. Arthur Rohl and co-workers at the Mt. Sinai School of Medicine published a report in *Science* on the high levels of airborne asbestos exposure entailed by mixing, sanding, and sweeping up after applying drywall

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spackling and joint compounds. The Natural Resources Defense Council then petitioned the Consumer Product Safety Commission to ban asbestos in such products. Throughout 1977, Union Carbide led the opposition to the ban. The day before the ban order was published in the *Federal Register,* Union Carbide reiterated its objection, on the basis that "consumer" exposure (as distinct from occupational exposure) did not entail an "unreasonable risk" (H.B. Rhodes and J.F. Collings, Union Carbide Corp. Metals Div. letter to R.D. Pittle, Consumer Product Safety Commission, Dec. 14, 1977).

Union Carbide hired Dr. Hans Weill, longtime asbestos industry consultant and chest physician, to fly to Bhopal, India, in the wake of the catastrophic chemical release in that city on December 3, 1984. Dr. Weill, who also serves as an expert witness in asbestos product liability suits, has testified (*Timm v. Raymark* Solano County, CA Case No. 85911, Jan. 14-15, 1985) that he was correctly quoted in the *New York Times,* which reported on December 15, 1984:

> Dr. Weill said that the victims who had survived to this point "have an encouraging prognosis" and that most would probably recover fully.

This extraordinarily optimistic outlook was not shared by the editors of the prestigious journal, *Lancet,* who stated that longterm lung effects "can be expected" (Dec. 15, 1984). Nor has it been borne out by experience. In March, 1985, Indian doctors reported that pulmonary fibrosis had developed in approximately 20,000 people, diagnosable by chest X-ray and pulmonary function tests.

Even before the purchase of the asbestos mines, Union Carbide (Chemicals Co.) was aware that asbestos dust was hazardous and conducted tests to determine the relative exposures from Johns-Manville and Owens-Corning thermal insulation products (See 1962 Peele study in Table 8, Chapter 5).

Union Carbide played a leading role in the National Safety Council in the 1930s and in the Industrial Hygiene Foundation

in the 1940s, having representatives on the executive boards of these organizations. Carbide sent three representatives to the Seventh Saranac Symposium in 1952, where asbestosis and cancer were discussed repeatedly (See "The Seventh Saranac Symposium" in Chapter 2).

W.R. GRACE & COMPANY

W.R. Grace bought Dewey & Almy Chemical Co., which had made asbestos brake linings, in 1954. In 1963, Grace purchased the Zonolite Company, which operated the world's largest vermiculite mines (in Libby, Montana). Zonolite made "Mono-Kote" fireproofing cement and asbestos-containing acoustical plaster.

The Dewey & Almy Chemical Company had numerous compensation claims brought by employees of its "Multibestos" plant, which closed in Massachusetts in 1936. Bradley Dewey, the firm's president, was interested in the subject of asbestosis and corresponded with a state official and others about it (See "Rising Tide of Compensation in the 1930s" in Chapter 3). Some asbestosis cases at the Multibestos plant were reviewed at the Saranac Laboratory in the mid-1930s (Vorwald Patient Files, Nos. P-31-37, P-35-85, P-34-101, P-35-129, and P-36-124, Armed Forces Institute of Pathology, Washington, DC).

The Montana operation was originally called the Vermiculite and Asbestos Corporation when mining began in 1919 (both minerals were present in the deposit). Large-scale production began in the 1930s, as vermiculite-expanding factories were built in Spokane, Chicago, and Detroit. The vermiculite was used just in insulation at first, then in concrete mixes in the 1950s.

Montana State Board of Health industrial hygienist Benjamin Wake visited the Libby mine and mill in 1956 and took atmospheric dust samples. Total dust counts averaged 40 MPPCF. Relying on company records saying the dust was 8-21% asbestos, Wake estimated that the maximum concentration of total dust should not exceed 25-30 MPPCF.

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Numerous recommendations were made to management to improve dust control in the mill.

Wake returned to the plant in 1958, again taking air samples (average total dust: 23.8 MPPCF) and making even more extensive recommendations for dust control. He again called attention to asbestos as a respiratory hazard. Conditions were still poor in 1962, with 20 dust counts averaging 43.3 MPPCF. Based on an analysis indicating that 40% of the airborne dust was tremolite asbestos, Wake suggested a maximum of 12 MPPCF to limit the pure asbestos exposure to 5 MPPCF. There was no improvement in 1963, either.

Wake's reports were all marked, "This report is confidential and is not for distribution except to the management of the Zonolite Company." The reports were all titled "Report on an Industrial Hygiene Study of the Zonolite Company Libby, Montana" (Aug. 8-9, 1956; Jan. 12, 1959; Apr. 19, 1962; and Apr. 11, 1963. Montana State Board of Health reports).

Documents produced in discovery relate to conditions from the standpoint of management:

June 14, 1961. Letter from E. Lovick (Libby plant manager) to C.A. Pratt (VP, Western Mineral Products Co.) acknowledges that asbestosis is a matter of concern based on "many studies." The 1956 report from the Montana State Board of Health is quoted as saying asbestos dust is "of considerable toxicity." A 19-year mill employee was very disabled and sent to a TB sanitarium where he was diagnosed as having "questionable asbestosis." Montana's inclusion of occupational disease coverage in the workers' comp. law in 1959 was accompanied by the company's decision to institute an employee X-ray program. Doctors' reports are said to have been inconclusive on the question of whether there was a lung disease hazard in the plant. Asbestos in concentrates shipped to vermiculite expanding plants should give rise to "very small" amounts of it in the dust in expansion plants. "Dust Foe" respirators provided.

Aug. 11, 1961. Letter from Pratt to Lovick states that Western Mineral Products (WMP) also has pre-employment X-rays and appreciates any effort to lower the asbestos content of the ore.

Sept. 15, 1961. Letter from Pratt to J.A. Kelley (Zonolite) mentions that Minneapolis Health Dept. has expressed concern about dust in vermiculite plants.

Apr. 2, 1964. Letter from Pratt to Kelley mentions a claim for total disability compensated in Minneapolis; and another worker seen by a Dr. Park who was advised to leave the employ of WMP.

Aug. 25, 1964. Letter from Dr. W. Nelson in Libby to J. Kelley (President, Zonolite Div. of W.R. Grace) asks for expenses to go to a medical center and obtain clinical training in occupational lung diseases. He notes that his 1959 X-ray study showed "an unusually high incidence of basilar fibrosis," at Zonolite. The survey was repeated in 1964, and "the consensus of local medical opinion was that an important increased incidence of chronic respiratory disease existed in Zonolite employees who had prolonged exposure to dust." Preliminary analysis showed "distinct and important change in respiratory function and pathology." He had not charged for his services but now requested assistance to consult and make time for a competent analysis of his data.

Oct. 21, 1964. Letter from Dr. Siemens (Alberta Dept. Pub. Hlth.) to T.A. Williams (Grant Industries) reports that 7/9 workers examined had abnormal forced breathing curves and 2 had fibrosis, recommends respirators. Attached is a note from H. Buchwald (16 Sept. 1964) calling attention to the use of asbestos in "Mono-Kote." Asbestos is described as a "well known cause of lung fibrosis... It is most important that dust respirators be worn when any work is done with ground asbestos."

Dec. 3, 1964. Letter from Williams to Dr. Siemens assures that no adverse health effects had been seen among U.S. Zonolite plant workers. It does acknowledge a danger from asbestos and the need to use respirators.

Dec. 8, 1964. Letter from N. Bushell (Grant Industries) to J.A. Kelley encloses all the above Williams-Siemens correspondence.

Dec. 29, 1964. Letter from L. Park (MD Casualty) to F.W. Rupp (WRG-Zonolite) suggests respirator use and maintenance program to follow.

Jan. 2, 1965. Memo from R.A. Bleich (Libby plant) to J.A. Kelley (WRG headquarters) comments on reports from Montana State

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Board of Health and says, "I can only say it presents a very sorry record."

Jan. 2, 1965. Memo from Lovick (Libby) to J.A. Kelley, "Dust at Libby," reviews events. The doctors' findings in the 1959 health survey were described as equivocal. A 1964 follow-up exam had pulmonary function tests in addition to chest X-rays: 30/143 showed emphysema or fibrosis, and in 14 there was progression in the serial X-rays since 1959. Of 39 hourly workers with over 10 yrs. employment, 18 were classed as abnormal. One 19-yr employee with severe impairment was ultimately diagnosed as having "questionable asbestosis." In 1962 a Wyoming doctor said his patient, a former employee, had progressive fibrosis resembling asbestosis. In 1961, a Spokane doctor told the company that another former employee had extensive bilateral pneumoconiosis with definite progression. "These cases were referred to Chicago and handled by our insurance carrier." There had been other cases, too. Attachments listed included a survey report by Dr. Nelson and medical reports on 4 employees with 7-19 years' employment.

Feb. 4, 1965. Bushell asks Kelley if Zonolite had contacted the Alberta health dept. and notes that 2 employees were being sent to a chest clinic at the dept.'s recommendation.

Feb. 9, 1965. O.F. Stewart (WRG headquarters) reply to Bushell acknowledges that the presence of asbestos in Libby vermiculite, and says there have been reports of "men having pulmonary trouble," at Libby and WMP. Letter details steps being taken to control dust and disease at WRG plants. Attachments speak to growing public concern, and letter says to anticipate increasing government regulation in designing dust control into plants.

Oct. 4, 1965. Report by Dr. Wiley (Los Angeles Co. Div. Occup. Health) says CA Zonolite plant had no apparent hazard—even though breathing zone of operator "mixing Mono-Kote, asbestos side" was 7.7 MPPCF.

Jan. 5, 1968. "Personal and confidential" memo from P. Kostic to R.W. Sterrett summarizes meetings with Johns-Manville environmental specialists E. Fenner and C. Sheckler. The main focus is on 32 Libby workers with abnormal chest X-rays, and the need to attain exposures in the plant of no more than 5 MPPCF total

dust. "Fenner and Sheckler emphasized that Threshold Limits should be used as guides... and should not be regarded as fine lines between safe and dangerous conditions."

Nov. 28, 1969. Memo from T.F. Egan to R.W. Sterrett (WRG Zonolite Div.) describes a presentation by Dr. Irving Selikoff on the hazards of sprayed asbestos insulation. "The officials of the international unions were there along with the contractors and I know it landed like a bomb. We must go all out to get asbestos out of Mono-Kote at once."

July 15, 1970. Report by W.C. Cooper, J.L. Balzer, and D.P. Fowler, *Asbestos Fiber Concentrations in Air from Spray Fireproofing Operations Using Zonolite Products*, Tabershaw-Cooper Associates, Berkeley, CA. Samples of exposures to workers applying sprayed fireproofing of vermiculite-asbestos cement were taken at several construction sites. The highest exposures were spray gun operators', 2.5 to 8 f/cc. Other members of spray crews were exposed to 0.5 to 1.9 f/cc. Exposures on other floors than those being sprayed and in the neighborhood of buildings where spraying was being done were less than 0.01 f/cc.

GAF CORPORATION
(Ruberoid)

Ruberoid Company operated asbestos mines in Vermont and made asbestos insulation and shingles. It was taken over by GAF Corporation in 1967.

Ruberoid had a full-page advertisement in the March, 1930, issue of *Asbestos* magazine that carried an article on asbestosis.

In the 1930s, employees of a Ruberoid plant in St. Louis sued the company, claiming they suffered respiratory impairment from their exposures to dust. The plaintiffs charged that management had been negligent in not posting warnings of the dangers, not installing exhaust ventilation equipment, and failing to provide respirators and medical examinations to the workers (Samuel Robertson and Alexander Smith suits against Eternit, Inc., and Ruberoid Co., Circuit Court of City of St. Louis, both filed around 1934). The outcomes of these cases are not known.

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In 1952, a workers' compensation claim was filed against Ruberoid by another worker at the Missouri plant, Fee James, who claimed he was totally disabled with asbestosis and silicosis. The workers' compensation claim was then withdrawn and a damage suit filed in its place. James' deposition recounted the extremely dusty conditions he worked in as a "beaterman" at Ruberoid's shingle plant, dumping asbestos and other materials into mixing tanks, etc. A settlement was reached in the case in 1953 (*Fee James vs. Ruberoid Co.*, U.S. Dist. Court, E. Dist. MO, Cause No. 8864).

In 1954, a damage suit was filed against Ruberoid following the death of another worker in the St. Louis plant. Opil B. Reed had worked in the asbestos room and warehouse from 1944 until his death in 1953 from a respiratory condition. Damages were sought by his family, which charged the company with negligence along similar lines as Robertson and Smith had done twenty years earlier. The outcome of this case is not known (*Gloria D. Reed et al. vs. Ruberoid Co.*, U.S. Dist Court, E. Dist. MO, No. 9875).

Ruberoid was also named as a defendant in the product liability suit brought by the widow of Clarence Faciane in 1961-62 (See "Lawsuits by Product Users against Asbestos Manufacturers" in Chapter 3).

Ruberoid joined the Industrial Hygiene Foundation in 1953. The *Industrial Hygiene Digest* listed the 1953 Threshold Limit Values published by ACGIH in the October, 1953 issue, giving 5 MPPCF as the TLV for asbestos dust. In December of 1953, the *Digest* published a table of state occupational disease statistics, including one case of "Asbestosis—cancer (dust, asbestos)" occurring in Connecticut in October of 1953.

Ruberoid was also a member of the National Insulation Manufacturers Association. A Ruberoid representative participated in discussions wherein a NIMA health program was rejected in 1960, and the text of the Johns-Manville insulation shipping carton warning label was presented in 1964. On June 4, 1970, GAF insulation marketing manager R.W. Henry wrote to NIMA executive secretary J.M. Barnhart that caution labels would be printed on "Calsilite" insulation products.

COMPANIES MINING ASBESTOS IN QUEBEC, CANADA

There is a body of knowledge that may be ascribed to Canadian asbestos mining companies, generally. The largest asbestos mining operation in Quebec was that of Johns-Manville (sold by Manville Corporation to former employees in 1983), in the town of Asbestos. Others are located not far away, most near the town of Thetford Mines. These others include, or in the past years have included:

Company	Relevant History
Bell Asbestos Mines	Subsidiary of Keasbey & Mattison Co. which itself was bought by Turner & Newall, Ltd. (U.K.) in 1934. Sold in 1980 to the Quebec government company, Société National de l'Amiante.
Asbestos Corporation, Ltd.	Formed by the consolidation of many smaller mines in 1925; General Dynamics Corp. (U.S.) obtained a 54% interest in 1969 and sold it to Société National de l'Amiante in 1981.
Johnson's Company	Obtained by Asbestos Corp. Ltd. in 1964.
Nicolet Asbestos Mines, Ltd.	Operated by Nicolet Industries, Inc. (U.S.) from 1939-1969.
National Asbestos Mine	Operated by National Gypsum Company from 1958-1973 and sold to Lake Asbestos.
Lake Asbestos (Lac d'Amiante du Quebec, Ltee.)	Subsidiary of Asarco, Inc. (U.S.) in operation since 1958.
Flintkote Mines, Ltd.	Subsidiary of Flintkote Company (U.S.), in operation from 1946 until around 1970.
Quebec Asbestos Corp.; Carey Canadian Mines	Subsidiaries of Philip Carey Manufacturing Company (U.S.), which in turn has become part of Jim Walter Corp. (U.S.). The first of these operations closed and the second began in the 1950s.

QUEBEC, CANADA

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Cooperation among asbestos mining companies in Quebec dates from 1930 or before, on the subject of asbestosis. In that year, an article on asbestosis appeared in *Asbestos* magazine amidst advertisements by Philip Carey Manufacturing Company, Johns-Manville, Keasbey & Mattison, Asbestos Corporation Ltd., and others. Other material on asbestos hazards known to mining firms in Quebec includes the following items:

1. Health surveys were undertaken under the auspices of the Metropolitan Life Insurance Company in 1930 by Drs. Frank Pedley and A.J. Lanza. Their findings were contained in a report by Dr. Geroge Wheatley, medical director of Metropolitan Life. This obscure 1944 report, *Tuberculosis and Asbestosis*, included data from a 1930 survey of 195 asbestos miners in Asbestos and Thetford Mines. Of this number, 42 had asbestosis. The Wheatley report also noted that asbestosis was a compensable disease in the Province. According to a memorandum by Quebec Asbestos Mining Association lawyer I. Sabourin (attached to the back of the report), the report had been sent to compensation officials and pulmonary experts in Quebec at the time it was prepared. (See also "Other Events of 1930" in Chapter 1.)

   Another report produced by Metropolitan Life Insurance Company identifies the companies surveyed in Thetford Mines as Asbestos Corporation, Keasbey & Mattison, and Johnson's Mine. (Frank Pedley. *Report of the Physical Examinations and X-ray Examinations of Asbestos Workers in Asbestos and Thetford Mines, Quebec*, 15 pages, Nov. 1930).

2. Burton LeDoux report, "Asbestosis," and the asbestos strike of 1949.

   Pierre Elliott Trudeau's book, *The Asbestos Strike* (Toronto: J. Lorimer & Co., 1974) says that LeDoux had previously written exposés of silicosis in Quebec, creating a scandal in 1948 (pp. 241-242, 274). His investigation of the asbestos mines was written entirely about Quebec Asbestos Corp., Ltd. a subsidiary of Philip Carey. LeDoux' account was printed in the newspaper *Le Devoir*, an indictment that filled several full pages of the newspaper. It was entitled, "Asbestosis at East Broughton—A Village of 3,000 Suffocated by Dust," and appeared in print on January 12, 1949.

   LeDoux' account was also printed in English. It describes case histories of workers disabled by asbestosis, local doctors who were afraid to tell them so, estimates of how much profit Carey

mined out of the town, descriptions of asbestos air pollution in town, commentary on the "ample and authoritative medical literature... that the disease is incurable and fatal"; and culminates with what LeDoux called "proof of company and government responsibility" starting in 1944. This was a thorough, piercing, investigative report.

LeDevoir let hardly a day pass for the next month without adding reports and editorials on asbestosis. One of the reporters of this scene, Gerard Pelletier of *Le Devoir,* is the raconteur of the chapter of Trudeau's book about press coverage of the strike. He described the workers of Carey's East Broughton mining operation as "preeminently the victims of asbestosis," and yet the only unionists who did not join the five-month strike in the asbestos mines that began in February, 1949.

3. A.J. Vorwald, *Asbestosis and Pulmonary Cancer.* Saranac Laboratory, report to Q.A.M.A.

   The Saranac Lab was commissioned by the Quebec Asbestos Mining Association to test Canadian chrysotile asbestos in mice by inhalation. By May 1952, this preliminary report of 14 months' testing appeared, showing a trend toward positive findings, and shortly thereafter the study was apparently halted. (See "The Saranac Lab's Cancer Studies for the Quebec Asbestos Mining Association," in Chapter 2.)

4. P. Cartier, "Reports of Cancer among Asbestos Miners at Thetford Mines," 1952-1955.

   Pathology reviews of tissues were done at the Saranac Laboratory for the mining companies starting in 1942, and a number of pulmonary cancer cases were already recorded by 1949. (See "Dr. Schepers' Visit to America," in Chapter 2.) Dr. Cartier, of the Thetford Industrial Clinic, periodically reported on these cancer cases. (See "More Reports and Reviews" and "The Seventh Saranac Symposium," in Chapter 2.)

5. *Montreal Star* (March 20, 1975).

   Contains two front-page stories about the Thetford clinic's failure to inform asbestos miners that they had asbestosis, over a period of decades.

The minutes of the Quebec Asbestos Mining Association (founded in 1931) have never been made available for inspection in discovery proceedings.

PHILIP CAREY MANUFACTURING COMPANY
(later Celotex, Panacon, Jim Walter Corp.)

The Philip Carey Company of Cincinnati, Ohio, boasted that it had been supplying asbestos and asbestos products for over 50 years in an ad appearing in *Asbestos*, in March, 1930 (this issue also carried an article about asbestosis). Carey got into the insulation contracting business as well. Publicity over asbestosis among Carey's Quebec mine employees led to a historic asbestos strike in the Province. (See "Companies Mining Asbestos in Quebec, Canada," this chapter.)

The following documentation relates directly to Carey:

1. *Heating and Ventilating* magazine, June, 1944.
   Contained an article by Hutchinson ("Dust as an Industrial Health Hazard") noting the asbestosis hazard to insulation workers and others; also an advertisement by Philip Carey Manufacturing Company for all-asbestos "Careyduct. (See "Trade Journals," in Chapter 10.)

2. In late 1944, a Carey plant worker in Ohio died, and Dr. Robert Ritterhoff diagnosed asbestosis at autopsy. This was pathologically confirmed by Dr. Gardner at the Saranac Laboratory. When Gardner requested details about the man's exposure to dusts, Ritterhoff replied that the company had been "uncooperative." He explained, "They have not permitted me to visit the plant, nor have they given in detail his occupational history." (letter dated Dec. 23, 1944) Dr. Ritterhoff eventually did visit the company and discuss this case with a company official. "The purpose of the visit was to tell someone at Philip Carey that their employee, Mr. Scobie, died of asbestosis," Dr. Ritterhoff recalls. He was informed by his co-worker, Dr. John Skavlem, that the company had "privately" compensated Mr. Scobie's widow. (Deposition of Dr. Ritterhoff, *State of Maryland v. Keene Corp. et al.*, Civ. No. 1108600. Circuit Court Anne Arundel Co., MD, taken Jan. 30, 1986; and Vorwald Patient File No. P-44-326, Armed Forces Institute of Pathology, Washington, DC.)

3. Following the death of Carey employee Len R. Hope in 1953, a workers' compensation claim was filed in Ohio by his widow. This went through various appeals and was ultimately resolved by pathologist Kenneth M. Lynch's report in 1956, to the effect

that the man's death was caused by asbestosis. Compensation was awarded on Jan. 24, 1957 (Len Hope file from archives of K.M. Lynch, Ohio Industrial Commission No. OD 79998).

4. Contracting Division Compensation Claims by Insulation Workers.

   Carey was named as a defendant in claims brought by Swartout, Riley, Strethorst, Gilivich, and Onofrio, with notice to Carey dated from 1956-1963 (see "Claims by Insulators against Contracting Divisions of Asbestos Product Manufacturers," in Chapter 3); and Latto in 1961-1962. (See "The Mancuso Documents," in Chapter 3.)

5. Carey was named as a defendant in 1961 in the product liability suit brought against insulation manufacturers by G. Faciane. (See "Lawsuits by Product Users Against Asbestos Manufacturers," in Chapter 3.)

6. The Mancuso Documents, 1962-1963

   At the direction of actuaries, Carey hired Dr. Thomas Mancuso as Consulting Medical Director for the entire company. Mancuso reported directly to top management about the urgent need for measures to protect employees, customers for Carey asbestos products, and neighbors of Carey facilities exposed to asbestos air pollution. (See "The Mancuso Documents," in Chapter 3.)

ASBESTOS CORPORATION LIMITED (ACL)

This company was nationalized within the last few years and incorporated into the Quebec government company, Société Nationale de l'Amiante.

A dust survey of the firm's King mine and mill was conducted in 1944 by Metropolitan Life Insurance Company, and the brief report of the findings was on file (Document No. 1178) at the Institute of Occupational and Environmental Health, in Montreal (I.O.E.H. was a part of the Quebec Asbestos Mining Association until its library was merged into the Canadian Asbestos Information Centre in 1982). The report notes that a similar survey had been conducted in 1930.

Dust concentrations ranged from 11.6 to 26.6 MPPCF in the five operations evaluated. The plant was not running at full production, and the windows were open in most areas at the time samples were taken. Improved housekeeping and the covering of conveyors, in addition to the above factors, were given as reasons for the "much lower" dust concentrations measured in 1944 than in 1930. In terms of plant design, very little had changed:

> No changes have been made in the mill operations since the first survey. The only effort at dust suppression consisted in covering some conveyors.

The Metropolitan Life report recommended that efforts be made to lower exposures to a maximum concentration of 5 MPPCF. In this connection, the report of the U.S. Public Health Service (Dreessen *et al.*, 1938) was cited. Reprints of two papers by Dr. Lanza and his co-workers at Met Life (1935, 1936) were attached to the King Mine survey report.

Starting in 1943, numerous cases in which asbestosis was suspected among ACL employees were referred to the Saranac Laboratory. Many of these people had been seen by Dr. Cartier's Thetford Industrial Clinic, and compensation claims had been filed in at least 17 of the cases reviewed by Dr. Gardner and Dr. Vorwald between 1943 and 1957. In a 1946 case where a death claim had been filed, the asbestosis was extensive and was accompanied by lung cancer (Vorwald Patient File P-46-372). The Treasurer of ACL, whose exposure consisted of office work only starting in 1920, died from pleural mesothelioma in 1949 (Vorwald Patient File IM-573). Details of these cases beyond those in the Vorwald files are unavailable from the Quebec government and the mining companies in Quebec, due to the Quebec Records Concerns Act, which bars the transfer of certain types of records out of the Province, even as photocopies.

On January 5, 1970, ACL Vice President I.C. Campbell wrote to representatives of other asbestos mining companies that caution labels would be placed on future ACL asbestos shipments. These labels were being placed on shipments "to Canadian and American customers *only*" (original emphasis):

> This bag contains chrysotile asbestos fibre. Persons exposed to this material should use adequate protective devices as inhalation of this material over long periods may be harmful.

JOHNS-MANVILLE CORPORATION
(renamed Manville in 1981)

This company was the asbestos industry leader in the United States, with mines in Canada. Its founder was Henry Ward Johns, who patented inventions for roofing and insulation products. Johns started his own company at the age of 21, and died 40 years later of a chronic lung condition, in 1898. (His death certificate lists the cause of death as "phthisis pulmonalis.")

The company's continuous concern about the problem of asbestosis apparently dates from the late 1920s. Lanza, in his 1935 publication, acknowledged that "officials representing the asbestos industry in the United States" had approached him to conduct a health survey in 1929.

J-M also presumably knew that Lanza and Pedley examined workers at their mine in Asbestos, Quebec, and identified 18 cases of asbestosis there in 1930 (see "Other Events of 1930," in Chapter 1).

A 1930 report by J-M Sales Promotion Department (Market Analysis Section) contained factual summaries of British medical reports published in 1929. This is one of the few documents of interest produced in discovery by Johns-Manville (from files of the J-M Waukegan, Illinois plant).

Lawsuits were filed against Johns-Manville by employees claiming disability from lung diseases at least as early as 1929. The corporation's Board of Directors approved of a settlement of asbestosis lawsuits in New Jersey in 1933. (See "Asbestos

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Johns-Manville's early involvement in matters relating to the health hazards of asbestos seems to have been handled primarily by corporate attorney Vandiver Brown in the years 1930-1950. Shortly after 1950, Brown was summarily retired, and until his death in 1983 he resided alternatively in Scotland and Waco, Texas. Plaintiffs' attorneys were surprised to discover that he was still living, having been told in Johns-Manville's Answers to Interrogatories that Vandiver Brown was dead. Brown's doctor and banker (financial guardian) then testified that he was completely senile and in such poor health that he could not safely undergo a deposition. Brown never was prevailed upon to add to the documentary record of his years at Johns-Manville.

Brown's activities in the 1930s are known largely through the Sumner Simpson Papers. (See "Raybestos-Manhattan," this chapter; and Chapter 3.) These activities included making editorial suggestions to Dr. Lanza on galley proofs of his paper published in 1935; discouraging the trade magazine *Asbestos* from running stories on asbestosis and dust control; and representing asbestos companies sponsoring research at the Saranac Laboratory. In this last capacity, Brown vigilantly watched for any violation of the laboratory director's contract forbidding publication without approval of the industry sponsors. He also received in 1943 an annotated outline of a monograph that Dr. Gardner intended to write. This contained evaluations of human and unpublished Saranac animal test data, to the effect that in both cases the evidence was suggestive but not conclusive that asbestos was a carcinogen. (See "Early Saranac Laboratory Cancer Tests with Asbestos," in Chapter 2.) Brown and representatives of other companies pressed Saranac to omit all mention of cancer in the published report of Gardner's research (See Appendix 4).

Vandiver Brown was the asbestos industry representative who joined with representatives of other industries to launch the Air Hygiene Foundation.

Brown and the Johns-Manville president met with Charles

Roemer and other officials from the Union Asbestos and Rubber Company in 1942 or 1943. According to Mr. Roemer, Brown explained that it was company policy to not tell employees their medical examinations showed they had asbestosis. Brown went on to explain the financial reasoning behind this policy. (See "A Lobster Lunch with Vandiver Brown," in Chapter 3, and opening quote to this chapter.)

In 1947, Brown acknowledged the lack of scientific basis of the tentative threshold limit value first proposed by the U.S. Public Health Service. (See "Unsteady Movement Toward Numerical Exposure Limits," in Chapter 4.)

In 1950, Brown demanded that Dr. Gerrit Schepers suppress a report Schepers had prepared for the South African government about the asbestos problem in the U.S. and Canada. Brown objected particularly to Schepers' reference to cancer at the Canadian mines and the extreme dustiness of two Johns-Manville asbestos plants. (See "Dr. Schepers' Visit to America," in Chapter 2).

In late 1950, Page Woodard, another J-M executive, met with Dr. Vorwald, Dr. A.J. Lanza, and Quebec Asbestos Mining Association (QAMA) attorney Ivan Sabourin to negotiate terms for an animal inhalation test on the carcinogenicity of asbestos. The test was apparently interrupted before completion, and none of the findings were published. (See "The Saranac Lab's Cancer Studies for the Quebec Asbestos Mining Association," in Chapter 2.)

Another key figure in the Johns-Manville response to the health threat of asbestos was Dr. Kenneth W. Smith. At the company's large mine and mill complex at Asbestos, Quebec, he conducted a survey of 708 employees in the late 1940s and considered 59 "probable compensation claims." None of the employees were informed that they had asbestosis. (See "Compensation at the Asbestos Mines in Canada," in Chapter 3.) Even before 1949, Smith recalled that Johns-Manville's top medical official at Asbestos, Quebec was concerned that the town was downwind of J-M's mining activities. (See "Asbestos Air Pollution in the Community," in Chapter 7.)

In 1950, Dr. Gerrit Schepers met Dr. Smith and discussed

with him the pathological records of cancer on file at the Saranac Laboratory from eleven Canadian asbestos mine and mill workers. (See "Dr. Schepers' Visit to America," in Chapter 2.) But even before 1950, Dr. Harriet Hardy recalls, Dr. Smith was discreetly trying to interest doctors at the Massachusetts General Hospital in the issue of asbestos carcinogenesis. Even though this suggestion was well received, Smith later told Hardy he was not allowed to follow up because of J-M executives' objections.

Smith recommended warning labels for asbestos as early as 1952, the year he became corporate medical director. He testified as follows shortly before his death about the fate of that recommendation:

> The reason why the caution labels were not implemented immediately, it was a business decision as far as I could understand. Here was a recommendation, the corporation is in business to make, to provide jobs for people and make money for stockholders and they had to take into consideration the effects of everything they did and if the application of a caution label identifying a product as hazardous would cut into sales, there would be serious financial implications. And the powers of be (sic) had to make some effort to judge the necessity of the label versus the consequences of placing the label on the product.
>
> (K.W. Smith deposition in *Louisville Trust Co. v. Johns-Manville, Corp.* Jefferson Circuit Court, Common Pleas Br. 7th Div. of Kentucky, Case No. 174-922, April 21, 1976.)

Labels warning that breathing asbestos was dangerous were not placed on J-M asbestos (insulation) products until 1964; on sacks of J-M asbestos fiber from Canada until March, 1969. Apparently, others in the industry did not begin to label their products as hazardous until Johns-Manville did so; and some lagged years behind.

The company policy of not informing J-M employees when their medical examinations revealed asbestosis has also been described by Wilbur Ruff, former manager of the company's

Pittsburgh, California manufacturing plant. Ruff testified that this "hush-hush condition" persisted as company policy at the plant he managed until 1971 or 1972. Ruff himself had been told asbestos caused lung disease in the late 1940s from C.B. Burnett, who went on to become the company's president in 1960. (Sworn Statement of Wilbur L. Ruff, Jan. 11, 1978, at law offices of Marrs A. Craddick, Walnut Creek, California.)

At the corporate level, safety engineer Hugh Jackson worked closely with medical director Dr. Kenneth Smith. Even before Smith arrived at the corporate offices in New York, Jackson dealt with health problems at the plants, even arranging for lung tissue slides to be sent to Saranac Laboratory. In 1948, he verified that a plant foreman had died of asbestosis from breathing the general atmosphere in the plant, and expressed concern to Dr. Vorwald at Saranac that such exposure could produce such severe lung disease. (See Saranac Compensation Reviews for Manufacturers," and "Cancer," Chapter 3.)

In 1954, Jackson wrote to an official at the Waukegan plant that compliance with threshold limit values for employee exposure to asbestos did not assure protection for all the workers: "...no guarantee of full protection can be assumed at any level of exposure." (See "The American Conference of Governmental Industrial Hygienists TLVs," Chapter 4.)

A management "compensation committee" held regular meetings at the large Manville, New Jersey, manufacturing plant in 1957-1958. Kenneth Smith, Clifford Sheckler, and others decided whether to inform workers whose medical examinations had turned up lung disease, whether to transfer affected workers to less dusty areas of the plant, and how to handle the affected individuals so that they would not file workers' compensation claims. (See "Corporate Compensation Meetings at Manville," in Chapter 3.)

Johns-Manville has produced strikingly few historic records on asbestos disease compensation in legal discovery. However, it has come to light that a construction contracting firm owned by J-M was sued in 1933 by a workman, Bernard Dugan, who said he was totally disabled with lung disease from mixing asbestos-containing materials used in construction. In 1957

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and 1961, Johns-Manville was named in damage suits in New Jersey by insulators Frederick LeGrande and Fred Wenham. Both plaintiffs received out-of-court settlements. Johns-Manville was also named in the product liability suit filed by G. Faciane in 1961. (See "Lawsuits by Product Users Against Asbestos Manufacturers" in Chapter 3.)

Workers' compensation claims were also filed against Johns-Manville by insulation workers employed in J-M construction contracting divisions in the 1950s. Based mainly on a list of claims involving Armstrong Cork, it was possible to ascertain that J-M was joined as a co-defendant in the following cases:

Edward Campbell (1954)
James Riley (1957)
Harry Haake (1957)
John Swartout (1958)
Ervey McCarrell (1959)
Lewis Munger (1959)
Harvey Curtis (1961)
Anthony Onofrio (1962)
Robert Goans (1963)

(See "Workers' Compensation Claims by Insulators against Contracting Divisions of Asbestos Product Manufacturers," Chapter 3.) J-M was also a defendant in the claim of Dean Templeton in Michigan in 1960. (See "Owens Corning Fiberglas," this chapter.)

Johns-Manville also referred a number of asbestosis cases to the Saranac Laboratory for review. In the case of one worker who had asbestosis and died from lung cancer, Safety Engineer Hugh Jackson at corporate headquarters arranged to have the plant documents and chest X-rays sent to Saranac. He wrote to Dr. Vorwald on July 28, 1950, "As you know, Johns-Manville is considerably interested in the relationship of asbestosis and lung carcinoma" (Vorwald Patient File P-49-455). Two other cases of lung cancer and asbestosis were reviewed by Saranac for Johns-Manville in 1950 and 1951; one of these men had worked at the Waukegan, Illinois plant, and the other

had worked at the company's Quebec asbestos mine (Vorwald Patient Files P-50-495, P-51-542).

Johns-Manville was a member of the Asbestos Textile Institute, the National Insulation Manufacturers Association, Industrial Hygiene Foundation, Quebec Asbestos Mining Association, and the Asbestosis Research Council, among others. Through special studies, meetings, and publications of these organizations Johns-Manville was continually dealing with the problem of asbestos disease. (See "Industry Research and Trade Associations," in Chapter 10.)

By 1954, Johns-Manville operated a clinic in Asbestos, Quebec, with the capability to perform microscopic analyses of airborne dust samples. In addition, an annual survey was conducted with dust samples shipped to the Travelers Insurance Company for analysis (H. Rozovsky. "Air Handling and Dust Control at the Jeffrey Mine of Canadian Johns-Manville Company." *Canad. Mining J.* 75:59-65, 1954).

NATIONAL GYPSUM COMPANY

National Gypsum owned interests in asbestos mining (National Asbestos Mine in Quebec) and manufacturing (plants in Louisiana and New Jersey). This company made "Gold Bond" asbestos-cement panels.

Another product under development at the firm's research labs in 1949 was a sprayed acoustical treatment. Several different compositions were tested using various combinations of mineral wool, asbestos fibers and "floats," etc. The test materials were applied to the ceiling of a school auditorium in Ohio and evaluated. The first recommendation in the report was:

> The floats should be removed from the formula since the increase in dust and the possibility of Asbestosis out-weigh the slight increase in surface smoothness.

It was also recommended that the amosite asbestos content be raised to offset the effect of removing the short fibers (floats).

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(F.M. Stumpf and B.O. Stewart, "On the Job Application of Spraying Wool for Acoustical Treatments," File No. 6a-6004, Rept. No. 391, June 28, 1949).

During the years 1953-1972, employees' chest X-rays were regularly examined by Dr. George Wright, a radiologist formerly employed at the Saranac Laboratory. In at least one case, Dr. Wright went beyond the traditional physician's role and offered advice to the company on a matter of personnel policy.

> I suspect that (he) has more of a problem with his heart than he either knows about or is willing to talk about. In all probability the abnormalities in the basal portions of his lung are related to the heart disease but the possibility that he may have inflammation and changes in the pleura of the lung which might be related to asbestos exposure should be kept in mind. I don't believe that at this point it should be pointed out to him.
>
> It is my impression that you have done as much as management needs to do since you have called to his attention the fact that he has an abnormal film. From my own past experiences I would not advise making a stronger approach to either (him).or his physician.
>
> (G.W. Wright letter to Timothy D. Tolin, National Gypsum Personnel and Safety Supervisor, Millington, N.J. "Re: Film No. 27530 Taken on 10/4/68.")

Other documents obtained in discovery from National Gypsum describe a meeting by asbestos-cement producers on April 3, 1968, and subsequent events.

1. March 27, 1968 C.L. Sheckler (Manager, Occupational Environmental Control, Johns-Manville) letter to Frank Zimmerman (Director of Safety, National Gypsum).

   This is an invitation to a meeting of representatives from Johns-Manville, Certain-teed, General Aniline and Film (which had just purchased the Ruberoid Co.), Flintkote, and Owens-Corning. The letter noted that contact had been made already between the President of J-M (C.B. Burnett) and a Vice President of

National Gypsum (A.H. Fay). "We are currently preparing a booklet entitled 'Recommended Health and Safety Practices for Handling and Applying Asbestos-Cement Products'."

2. April 17, 1968 F.H. Zimmerman letter to Clifford L. Sheckler.

> In the Council meeting of April 3, 1968 held in your conference room, it was agreed that I would advise you by April 19, 1968 of National Gypsum Company's position relative to the printing and distribution of the booklet entitled, "Recommended Health and Safety Practices." Our position is that we strongly oppose the publication and distribution of the booklet. Our reasons are:
> a) No risk has been shown to the general public from exposure to asbestos cement products manufactured for use in the building and construction industry.
> b) The proposed booklet points to dangers to health from the handling of corrugated and flat asbestos sheets when there is no scientific evidence of such dangers.
> c) The booklet creates fear in the minds of buyers, users, and workers without justification. These fears would be damaging to the entire industry.

The letter affirmed that,

> This strong opposition to the publishing of the booklet has the full concurrence of the top executives of our company, including the Chief Executive Officer.

3. May 8, 1968 Sheckler letter to Zimmerman.

> I have received tentative approval of the booklet as written in draft form from Certain-teed, General Aniline and Film, and Johns-Manville. It would be extremely advantageous to have unanimous agreement of the council members concerning any publications dealing with health. This is especially desirable in view of the continuous adverse publicity and attacks on various materials.

Sheckler proposed that Mr. Fay come to another meeting in June, 1968, to try to work out points of disagreement concerning the booklet.

4. November 7, 1968 Zimmerman memorandum to A.H. Fay (Vice President, National Gypsum), entitled "Recommended Practices Booklet."

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to Clifford L. Sheckler.

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The memorandum summarized changes recommmended by Zimmerman in the draft booklet. This was provided to Fay in advance of the first meeting of the Asbestos Cement Products Association, Health and Safety Council, on Nov. 14, 1968. The gist of the recommended changes was to downplay the language and narrow the content of the draft version of the booklet.

> *COVER SHEET:* Title changed from 'Recommended Health and Safety Practices' to 'Recommended Practices.'
> *CONTENTS* Page 2—Removed section headline, 'For Health and Safety's Sake'...
> *INTRODUCTION* Page 3—Did considerable rewriting in this area to change statements which could be used against the industry in compensation or law suits. Have attempted to take 'scare' wording from the booklet.

The rest of the recommended changes followed the lines of the first three, above.

5. April 10, 1969 Zimmerman memorandum to E.J. Killian (Vice President).

   This reviewed the situation, indicating that Johns-Manville wanted to print the booklet about asbestos-cement products but apparently had not yet done so. At this time, the development of a booklet that would be acceptable industry-wide had been passed on to a committee of the new Asbestos Cement Products Association. Zimmerman anticipated, "many federal regulations controlling the health and safety aspects of asbestos workers."

TURNER & NEWALL, LTD.

Turner & Newall was founded in 1920 by the merger of four companies primarily in businesses using asbestos. Soon afterward the company obtained asbestos mines in southern Africa. In 1934, Turner & Newall purchased the Keasbey & Mattison Company, in Ambler, Pennsylvania. The American company made asbestos-cement products, shingles, and insulation, using fiber from its Bell Mine in Quebec. Bell in turn acquired an interest in Cassiar Asbestos Corporation, which owned chrysotile mines in western Canada. With the liquidation of Keasbey & Mattison in 1963 and sale of its asbestos-

cement operations to Certain-teed Products Corporation, Turner & Newall became the largest single stockholder in Certain-teed. Though mainly an "asbestos giant" in the 1960s, the firm was diversifying into plastics, fiber-glass, and mineral wool products as well. (Corporate history in *Turner & Newall Limited/The First Fifty Years 1920-1970*, copyright by Turner & Newall; and a series of articles on the British asbestos industry in *Asbestos* magazine, 1966-1967.)

According to Robert R. Porter, President of Keasbey & Mattison from 1957 to 1962:

> T & N had 100 percent control over decision making on policy matters for Keasbey and were in no sense passive stockholders. T & N possessed and exercised the ultimate control and dictated the manner in which the company's capital and resources should be employed... T & N had complete control over Keasbey asbestos fiber supply and control as to which products Keasbey made at its various plants... Because T & N operated other companies in Canada, including Atlas Asbestos Company, Keasbey was prevented from selling asbestos-containing products in Canada.
>
> (Affidavit of Robert R. Porter, filed with Commonwealth of Pennsylvania, County of Philadelphia, April 5, 1983)

In 1943, Leroy Gardner reported his studies and opinions to the asbestos industry in an outline which went to T & N via Porter's predecessor Ernest Muehleck at Keasbey & Mattison Company. The report contained unpublished animal data on asbestos carcinogenicity, and Gardner's repeated assertion that both human and animal data were "suggestive but not conclusive." Attached letters indicated concern about the cancer issue. (See "Early Saranac Laboratory Cancer Tests with Asbestos," in Chapter 2.)

The company defrayed a 1949 review and animal research on asbestos disease by J. MacLean-Smith, E.J. King, and I.D.P. Wooton of the Postgraduate Medical School in London ("Asbestosis"—unpublished). The review included numerous references to cancer and concluded that the reports were

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J.W. Roberts, Ltd., a Turner & Newall Company, initially marketed "Limpet" sprayed asbestos in the 1930s in both the U.K. and U.S. (through Keasbey & Mattison Company). Presumably, this company knew of the Factory Inspectorate's 1945 notice to insulation contractors expressing concern over the hazards of sprayed asbestos in shipyards. (See Table 8 in Chapter 5.) By 1946 the Roberts company ran a "Limpet Asbestos Spray School" in Leeds, England, where use of respirators by sprayers was advised.

T & N subsidiary Atlas Asbestos Company Ltd. sold sprayed Limpet asbestos in Canada. In 1949, a claim for asbestosis was filed by a worker who had applied Limpet on ships. The Vancouver Workmen's Compensation Board wrote to the federal government for further information, expressing concern about the growth of asbestos use in western Canada. The inquiry was passed on to engineer S.R. Plamondon of the Ministry of Health in Montreal. He wrote that, "From the companie's official, we are informed that they have never had any claim regarding asbestosis here in Canada." (Letter to Dr. K.C. Charron, Dept. National Health and Welfare, Ottawa, June 29, 1949.)

A number of employees of T & N's Bell Asbestos Mines in Quebec were diagnosed as having asbestosis in the 1940s and 1950s. At least 5 former Bell employees or their survivors were identifiably involved in workers' compensation proceedings starting in 1946. Lung cancer in combination with asbestosis was seen in Bell workers in 1950, and at least one of these was the subject of a workers' compensation claim in which Dr. Lanza testified for the company (Vorwald Patient Files P-50-475 and P-550-500). These cases were generally referred by QAMA attorney Sabourin or Dr. Cartier to the Saranac Laboratory, where pathologic materials were examined and reports rendered.

Doll's 1955 study showing an excessive incidence rate of lung cancer in asbestos textile manufacturing workers was based on experience at a Turner & Newall plant. Though the company had originally asked Doll to analyze the data, it was dis-

pleased with the findings and tried to block their publication. The company medical officer, J.F. Knox, did not dispute the positive association demonstrated in Doll's report. (See "1955: Doll's Study and Other Events," in Chapter 2.)

Turner & Newall subsidiary Keasbey & Mattison was named as a defendant in 1961 in the product liability suit brought against insulation manufacturers by G. Faciane. (See "Lawsuits by Product Users Against Asbestos Manufacturers," in Chapter 3.)

The major conference of the New York Academy of Sciences in 1964 took place after the asbestos-cement manufacturing facilities of Keasbey & Mattison had become the property of Certain-teed Corporation. Plant officials met with representatives of Turner & Newall at the New York conference, at which time they were told that the British firm was "years ahead of the U.S. in awareness of the medical problems associated with asbestos." A memorandum of this discussion continues,

> Dr. Knox (T & N medical officer) said that U.S. Industry, in general, does not want to accept the fact that asbestos is very hazardous and they will accept any doctor's view if he intimated that it is not hazardous.

The memorandum also notes that Turner & Newall officials were convinced that the 5 MPPCF guideline cited in the U.S. was "too high." (Memorandum from L.D. Horowitz to M.S. Davis, Jr. on Conference on Biological Effects of Asbestos/New York Academy of Sciences, Nov. 10, 1964.)

Keasbey & Mattison was a member of the Asbestos Textile Institute from its founding in 1944, and was a member of Industrial Hygiene Foundation from 1937–1962.

Keasbey & Mattison was also a party to the censorship of all references to cancer in the report of industry-sponsored asbestos research at Saranac, published by Vorwald in 1951 (See Appendix 4).

RAILROAD COMPANIES

In the United States, some transportation industries including railroads never made legal provision for workers' compensa-

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tion. As a result, employees who develop occupational diseases must bring suit against their employers in an appropriate legal forum. In the case of railroad workers, there has been intense exposure to asbestos insulation dust in roundhouses where locomotives were overhauled. The old steam locomotives were equipped with large quantities of asbestos insulation. Severe asbestos exposure in railroad maintenance work is apparently a thing of the past in the United States, with the replacement of steam locomotives by diesels and the substitution of asbestos-free railroad brake shoes. However, the toll of disease from past years is great (T.F. Mancuso. "Mesothelioma among Machinists in Railroad and Other Industries," *Amer. J. Indust. Med* 4:501-513, 1983).

Medical directors of the railroad companies have held annual meetings since 1921 under the auspices of the Association of American Railroads. The meetings of the Medical and Surgical Section, as the group was known (or simply the Medical Section in later years), were often concerned with occupational health and safety, and proceedings of the working sessions were published and distributed to the membership. The members of various committees and the attendees of each meeting were duly recognized in the proceedings, with each doctor's company affiliation designated.

The following notes of the meetings through 1958 relate to the forseeability of asbestos hazards by the medical officers of the railroad companies. The documents were located in the library of the Interstate Commerce Commission in Washington, D.C. (Proceedings of the Medical and Surgical Section of the Association of American Railroads). Relevant page numbers are noted in parentheses.

1932 Committee on Occupational Diseases and Rehabilitation reported on "Dust as an Industrial Hazard" (60-62), discussing pneumoconiosis at length. It was noted that chest X-rays were diagnostic of fibrous tissue. Many symptoms of pneumoconiosis are cited, hypersusceptibility to infection in the lung is noted. Wetting and ventilation are offered as control methods. Asbestos not explicitly mentioned.

1933 Report of the same committee by same title, recommends

respirators in addition to the above measures as controls. Asbestos not mentioned. (72,77).

1935 Report of the same committee now has a subtitle "Pneumoconiosis" (89-90). "Asbestosis is not a common condition but it causes extensive pulmonary fibrosis and takes on a more rapid course than does silicosis." Following, "(A)s railroad surgeons (we) are undoubtedly more interested in silicosis and asbestosis than in the other types." Examinations upon hire were advised to include complete history and physical, with chest X-ray "for diagnosis and future record."

> For old employees with a history of working in dust and having the classical clinical symptoms, we suggest:
>
> 1. To make a change in his occupation.
> 2. To make an X-ray of his chest for lung tissue.
>
> In the way of prevention it becomes necessary
>
> 1. To educate all concerned.
> 2. Get rid of dust.
> 3. Sprinkle the working area with water.
> 4. Have employees wear inhalers. (sic)
> 5. Have frequent analyses made of the dust content of the air at different times during the working hours.

1937 Discussion of occupational disease (compensation and prevention) laws enacted in Illinois, with mention of extended statute of limitations for asbestosis and silicosis claims. (19) Concern expressed that state distribution of pamphlets would "create a fear complex" with resulting unjustified workers' compensation claims (20).

> Silica, asbestos, and lead are the principal substances generating toxic dusts to which railway employees may be exposed. (20)

Pre-employment physicals and histories are again recommended, as well as periodic physical examinations of employees "in occupations in which known hazards exist." (21) Control measures discussed include: exhuast ventilation of dusty processes, substitution of safer materials and methods of handling, and use of personal protective equipment such as

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respirators approved for the intended use by the U.S. Bureau of Mines. (21-22) It is reiterated at the end that asbestosis and silicosis are dust diseases and can be contracted only by breathing asbestos or silica dust. (22)

Report of the Committee on Disability and Rehabilitation has a lengthy section, Pneumoconiosis. (72-76) This is almost entirely on silicosis, until the mention of the Illinois law provisions where asbestosis is mentioned.

1939 Report of Committee on Disability and Rehabilitation (CDR) noted the emergence of the Air Hygiene Foundation (name changed to Industrial Hygiene Foundation in 1941) with its interest in pneumoconiosis, noted that (37) CDR Chairman had attended AHF meetings and summarized AHF presentations. Summaries deal with industrial hygiene, compensation laws; Lanza quoted as saying that instead of removing men from dust hazards the dust should be removed. (38)

1940 CDR report again consists of review of presentations at AHF meeting. (28) "(M)any details are brought out at (AHF's) annual meetings which can be made of immense value to the Railroads." (29) Nothing on asbestosis here, but such items as Drinker's presentation on preventive engineering clearly had broad application.

1941 CDR Chariman again attended the AHF meeting but had nothing new to report on pneumoconiosis. (37,46)

1951 CDR report section on Pneumoconiosis contains the same
1952 language all three years. Opens with, "The Committee...
1953 mentioned silicosis and asbestosis as forms of the disease most interesting to railroad surgeons." (38 in 1951; 35 in 1952; 34 in 1953) Exam at time of hire to include history and chest X-ray, "particularly in those occupations where unusual quantities of silica or asbestos dust have been encountered or are contemplated as a routine occupational exposure." Periodic exams of such workers also recommended, with X-ray, and those presenting symptoms to be considered for removal and counseling.

Indexes in 1952 (42) and 1953 (41) list all years (of Medical Section published proceedings) in which the Committee previously discussed pneumoconiosis.

1957 CDR adds to and deletes some of its previous statements,

adding that periodic X-ray examinations should be done "annually" on employees exposed to dust. (24)

1958 The entire Medical Section of the Association of American Railroads hosted Dr. Alton Ochsner, a lung cancer surgeon from New Orleans. He had been affiliated with Illinois Central and Southern Pacific. (81)

> There is very good proof that asbestos is a cause of carcinoma. This is seen in individuals working with asbestos, particularly miners. It is also seen among plumbers who work with asbestos, seamfitters (sic) particularly. (81)

He said "Heuber" (Hueper) did a study "in which he showed there was a higher incidence of cancer among the operating staffs of the railroads than among the non-operating staffs." Ochsner attributed this finding to a preponderance of males in operations and females in offices (there was a well-recognized difference in incidence of the disease between the sexes).

He said people in these occupations with which an increased risk of cancer has been shown—who develop cancer themselves—are usually heavy smokers, and the smoking is the cause, not occupation. He noted that the only doctors who doubted smoking caused cancer worked for tobacco companies or smoked themselves. (84) Railroad doctors were advised to check smoking histories and tumor cell types of workers filing for compensation for lung cancer.

> If they have an adenocarcinoma, it has not been produced by smoking because it is not related to smoking.

Hueper had reported that lung cancer cases were more than three times as numerous among "operating" railroad workers (engineers, firemen, brakemen, conductors, switchmen, and roundhouse personnel) than "non-operating" workers. Yet the former group made up only about 25 percent of the work force. Hueper suspected oil and coal combustion products as a cause of occupational cancers (*A Quest Into the Environmental Causes of Cancer of the Lung* Washington: Public Health Service Publ. 452, 1955, p. 16).

Railroad claims agents also discussed asbestosis at meetings

and in their journals in the 1930s (P. Folger, "Legal and Other Aspects of Dust Hazards," *Minutes of the 45th Annual Meeting of the Association of Railway Claim Agents,* held in May, 1934, pp. 27-48; O.G. Browne, "Silicosis," *The Bulletin 19*:281-284, April, 1935; E.R. Hayhurst, "Common Occupational Diseases and Their Differential Diagnosis," *Minutes of the 48th Annual Meeting of the Association of Railway Claim Agents* held in May, 1937, pp. 31-41). In 1960, asbestos was listed as one of 7 materials which had been "suspected as lung carcinogens" in an article by Dr. I. Kaplan of the Baltimore and Ohio Railroad ("Relationship of Noxious Gases to Carcinoma of the Lung in Railroad Workers," *J.A.M.A. 171*:2039-2042, Dec. 12, 1959, reprinted in *The Bulletin 44*:511-520, 1960).

At least one railroad, the Norfolk & Western, had an asbestosis claim decades ago. The man had worked in the engine shop of the railroad, frequently handling insulation materials made with asbestos. He claimed he was totally disabled with asbestosis and had suffered pleural effusion as well (*Ancel Wheeler v. Norfolk & Western,* U.S. Dist. Court S. Dist. Ohio, W. Div., Civ. No. 2740; and Dr. Allen Barker's letter to Dr. W. R. Whitman, Chief Surgeon for N & W, Aug. 18, 1951 describing the X-ray findings as "compatible with asbestosis").