

ASBESTOS TEXTILE INSTITUTE

Annual Meeting

October 5, 1973

Wychmere Harbor Club, Harwichport, Massachusetts

PLAINTIFF'S
EXHIBIT

07379.00

In Attendance

AMATEX CORPORATION

W. Maaskant
J. L. Rainey
M. J. Scanlan
H. H. Walter

GARLOCK INC.

S. G. Dixit
A. Kuzmuk

JOHNS-MANVILLE CORPORATION

C. G. Guerin
A. Morrill (C.J-M)
J. P. Power (C.J-M)

NICOLET INDUSTRIES, INC.

E. W. Russell

H. K. PORTER COMPANY, INC.

E. C. Bratt
D. E. Childers
J. W. Echard
L. E. Moody

RAYBESTOS-MANHATTAN, INC.

M. N. Brooks
S. G. Ledbetter
R. T. Matthew
W. A. Mitchell
M. W. Oliver
M. Q. Scowcroft
I. H. Weaver

UNIROYAL, INC.

D. T. Austin
B. E. Carden
L. F. Dieringer
W. C. Hitchcock
E. A. Morris
S. J. Peele
H. E. Sunbury (retired)

ASBESTOS CORPORATION LTD.

G. F. A. Brink
P. E. Leclerc

BELL ASBESTOS MINES LTD.

M. Dorais
W. J. W. Smith
W. H. Smith

CASSIAR ASBESTOS CORPORATION LTD.

R. A. Kuntze
(Ontario Research Foundation)

LAKE ASBESTOS OF QUEBEC LTD.

E. A. Farrell
C. E. Stiefken (Asarco)

NIPPON ASBESTOS CO. LTD.

Y. Sato

TBA INDUSTRIAL PRODUCTS LTD.

H. J. Corson

AMERICAN SOCIETY FOR TESTING
AND MATERIALS

P. O. Nicodemus

CADWALADER, WICKERSHAM & TAFT

E. J. Leff

ASBESTOS TEXTILE INSTITUTE

D. M. Fagan

GUESTS OF THE A.T.I.

Alison D. McDonald, M.D., D.P.H.
McGill University

John H. Marsh, Asbestos Informa-
tion Association/North America

Robert A. Clifton
U.S. Bureau of Mines

Total attendance during the three-day meeting was 68 people, including 24 wives, and representing 19 companies or associations.

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PLAINTIFF'S
EXHIBIT

tabbles
WV-062763

M I N U T E S

1. The 1973 Annual Meeting of the Asbestos Textile Institute was called to order by President M. Q. Scowcroft at 8:30 A.M., October 5, 1973.
2. President Scowcroft welcomed the members in attendance and introduced the following as guests at the meeting: Alison D. McDonald, M.D., D.P.H., Associate Professor, Department of Epidemiology and Health, McGill University; Robert A. Clifton, Division of Non-metallic Minerals, U.S. Bureau of Mines; John H. Marsh, President of the Asbestos Information Association/North America and newly-appointed Director of Environmental Affairs for Raybestos-Manhattan, Inc.; and Paul O. Nicodemus, General Electric Company, the liaison between the ATI and ASTM.
3. Following past procedure, each person in attendance stated his name and company affiliation. The entire list of delegates is given on page 1 of these Minutes.
4. Upon President Scowcroft's calling for the reading of the Minutes of the last stated meeting, it was moved by A. Kuzmuk, seconded by E. A. Morris, and so carried, to dispense with the reading of same.
5. Treasurer E. A. Morris presented the Report of Funds of the Institute as of August 31, 1973. Net worth of the ATI as of the end of the Fiscal Year was \$16,144.79. The full Report is attached to these Minutes. S. J. Peele moved the Report be accepted. The motion was seconded by E. W. Russell and so voted, unanimously.
6. The President expressed genuine pleasure on the success of the meeting and on such a fine attendance of 68 in toto, including approximately 24 wives.
7. The President asked the members to mark their calendars and to plan to attend the following future meetings, as scheduled by the ATI:
 - Feb 7-8, 1974 - Mills Hyatt House, Charleston, South Carolina;
 - Jun. 6-7, 1974 - Twin Bridges Marriott, Washington, D.C.;
 - Sep 25-27, 1974 - The Cloister, Sea Island, Georgia;
 - Feb 6-7, 1975 - Holiday Inn-Independence Mall, Philadelphia, Pa;
 - Oct 1-3, 1975 - Ponte Vedra Club, Ponte Vedra Beach, Florida
 - Feb 5-6, 1976 - New Orleans Marriott, New Orleans, Louisiana.
8. Subsequent to advising the membership that the Institute had graciously accepted the generous invitation by the five ATI mining companies to visit Canada for the June 1975 General Meeting, President Scowcroft called William J. W. Smith, of Bell Asbestos Mines Ltd., to the podium. On behalf of Asbestos Corporation Ltd., Bell Asbestos Mines Ltd., Canadian Johns-Manville Co. Ltd., Cassiar

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Asbestos Corporation Ltd., and Lake Asbestos of Quebec Ltd., Mr. Smith cordially invited the ATI to join them in June 1975 in Quebec City. Included will be a one-day side trip to Thetford to visit the mines. The meeting will be held on a Thursday and a Friday and fishing arrangements will be made for Monday, Tuesday and part of Wednesday at some spot just north of Quebec City. The miners will want to know sometime in 1974 how many men are interested in the fishing trip

9. It was announced by President Scowcroft that the guest speaker at the February 1974 meeting in Charleston, South Carolina, will be Mr. Chain Robbins, newly-appointed Senior Adviser to John Stender and head of the new office of Occupational Health, OSHA. He will be accompanied by Lewis J. Cox, who recently was named special Assistant for Industry Liaison, OSHA.

10. Eugene J. Leff, of Cadwalader, Wickersham & Taft, presented Remarks of Legal Counsel. The full text of his remarks is attached hereto. Mr. Leff discussed the recent decision in Telex Corporation v. International Business Machines Corporation and the question of whether suits against monopolization penalize excellence of management of large corporations.

11. The Fiber Producers' Report was presented by E. A. Farrell, Sales Manager, Lake Asbestos of Quebec Ltd. Mr. Farrell stated that in 1972 the United States again was the largest importer of textile spinning fiber from Canada -- 13,700 tons. The United Kingdom and Yugoslavia followed. Yugoslavia is a new large consumer of spinning fiber. Canada shipped 29,000 tons of spinning fiber throughout the world, compared with 30,000 to 22 countries in 1971. The supply of Quebec spinning fiber is good but long grades from Cassiar are in short supply. The complete report is attached hereto... Mr. Farrell compared an AIA/NA report on the breakdown of asbestos usage in the U.S. vs a similar report from Industrial Minerals magazine giving world figures. In the U.S., textile fiber consumed 3% of the total tonnage, floor tile consumed 18% and asbestos-cement products, 25%. A different distribution, based on world consumption, was given by IM and included a percentage of 10% for floor tile and 70% for asbestos-cement products (a really big difference from the AIA/NA figures). Following a comment from the floor by R. A. Clifton, U.S. Bureau of Mines, it was agreed the 70% world usage of the asbestos-cement products category is quite high, although it could partly be attributed to the increase in construction in the developing countries. It was also stated that the 70% figure was the same as that given last year by IM, leaving one to ponder if new percentage figures had been compiled for the latest IM report.

12. The following reports of ATI activities at Committee level were presented by the respective Chairmen to the general membership. A copy of each Report is attached hereto, i.e.:

Air Hygiene & Manufacturing - B. E. Carden, Chairman;
Asbestos Advisory - E. W. Russell, Chairman;
Technical - J. W. Echerd, Chairman;

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Fiber Research & Testing - C. E. Stiefken, Chairman;
Environmental Health - L. F. Dieringer, Chairman.

R. A. Clifton added to Mr. Carden's report by stating that at present it does not appear that the Environmental Protection Agency has any great concern over any asbestos that may be in the water effluent from manufacturing plants. Also, there is no proof that asbestos in water is harmful.

13. The following announcements were made by President Scowcroft:

- a. The ATI was deeply saddened by the demise of George S. Fabel, on Sunday, September 23, 1973;
- b. Re-elected as Officers of the ATI for the ensuing year were M. Q. Scowcroft, President; A. Kuzmuk, Vice-President; and E. A. Morris, Treasurer.
- c. Asberit S.A., Rio de Janeiro, Brazil, was unanimously approved by the Board of Governors as a new Class D Associate Member.
- d. The Asbestos Information Association/North America has relocated to Suite 610, 1660 L Street, N.W., Washington, D.C. 20036 (Telephone: 202 223 4885). Its new Executive Director is Robert H. Mereness, formerly a public relations consultant in the Washington, D.C., area. Matthew M. Swetonic, the previous Executive Secretary, has joined Hill & Knowlton's Environmental Affairs Department in New York City. He will serve in a consulting capacity to the AIA/NA for a year or so.

14. President Scowcroft introduced, as the featured speaker, Alison D. McDonald, M.D., D.P.H., Associate Professor, Department of Epidemiology and Health, McGill University, Montreal, Quebec. He stated that Dr. McDonald has an educational and medically-professional background that makes one stand in awe. She is of British nationality and a Canadian citizen. Formal education includes the University of London Medical School, London School of Hygiene & Tropical Medicine, and a graduate student and Research Assistant, Department of Epidemiology, Harvard University. She holds seven advance degrees and is author or co-author of 45 papers.

15. The full text of Dr. McDonald's comprehensive and well-executed presentation, entitled "Chrysotile -- How Reassuring the Mining Experience," is attached to these Minutes.

16. There being no further business to be brought before the membership, E. A. Morris moved for adjournment. The motion was seconded by A. Kuzmuk and unanimously approved by the attending members, and the meeting was adjourned at 10:30 A.M.

Respectfully submitted,

Doris M. Fagan

Doris M. Fagan,
Executive Secretary

ASBESTOS TEXTILE INSTITUTE

Report of Funds as of August 31, 1973

Balance on Hand April 30, 1973 --

General Fund	\$ 1,462.06
Reserve Fund	19,845.91
Petty Cash Fund	<u>7.95</u>

Total on Hand April 30, 1973	\$ 21,316.92
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Receipts

To Reserve Fund	\$.00
To General Fund (all Book Sales)	<u>97.01</u>

Total Receipts	\$ 97.01
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	\$ 21,413.93
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Disbursements

Rental of Office Space (3 months)	\$ 135.00
Telephone (4 months)	129.45
Federal Income/FICA Taxes (2nd Qtr 73)	152.52
Pa. Unemployment Tax (2nd Qtr 73)	5.25
Pa. Income Tax (2nd Qtr 73)	12.09
Secretary's Net Wages (4 months)	508.00
Postage	121.35
Printing Services	103.11
Office Supplies & Miscellaneous Items	77.37
Revision of Fibre Test Manual	42.18
Legal Services/Expenses (1st/2nd Qtr 73)	2,824.29
Secretary's Travel Expense (6/73 meeting)	78.97
Expenses to ATI (2/73 meeting)	326.08
Expenses to ATI (6/73 meeting)	554.89
Advertisement in July 1973 ASBESTOS	129.24
Petty Cash Vouchers #17-34	<u>69.98</u>

Total Disbursements	\$ 5,295.37
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BALANCE ON HAND AUGUST 31, 1973	\$ 16,118.56
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Funds as of August 31, 1973 --

General Fund	\$ 2,683.68
Reserve Fund	13,346.91
Petty Cash Fund	<u>87.97</u>

TOTAL AVAILABLE FUNDS AUGUST 31, 1973 . .	\$ 16,118.56
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Assets as of August 31, 1973 --

Total Funds as listed above	\$ 16,118.56
Accounts Receivable (Book Sales)	25.23
Furniture and Equipment (Nominal Value)	<u>1.00</u>

TOTAL ASSETS	\$ 16,144.79
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TOTAL LIABILITIES	<u>2.00</u>
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TOTAL NET WORTH AUGUST 31, 1973 . .	\$ 16,144.79
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NOTE: During the period 5/1/73 thru 8/31/73 --

\$ 150.00 was drawn from General Fund for Petty Cash;

\$6500.00 was drawn from Reserve for General Fund.

*Doris M. Fagan*Respectfully submitted,
Doris M. Fagan,
Executive Secretary, ATI

ASBESTOS TEXTILE INSTITUTE

Report of Funds for Fiscal Year/September 1, 1972, thru August 31, 1973

Balance on Hand September 1, 1972 --

General Fund	\$ 3,992.64
Reserve Fund	9,313.41
Petty Cash Fund	<u>100.00</u>

Total on Hand at 9/1/72 \$ 13,406.05

Receipts

To Reserve Fund - Interest to 12/31/72	\$ 233.50
Dues for Year 1973	14,250.00
To General Fund - Special Assessments	750.00
Voluntary Contributions	250.00
Book Sales	311.78
Insurance Credits	<u>37.00</u>

Total Receipts \$ 15,832.29

\$ 29,238.33

Disbursements

Rental of Office Space	\$ 705.00
Telephone	430.86
Secretary's Net Wages	1,954.00
N.J. Unemployment & Disability Tax	67.50
Pa. Unemployment Tax	10.50
Federal Unemployment Tax	15.00
Pa. Income Tax	24.18
Federal Income & FICA Taxes	481.24
Printing & Office Supplies (9/1/72-1/2/73)	245.53
Postage (1/2/73-8/31/73)	199.49
Printing Services (1/2/73-8/31/73)	138.11
Office Supplies & Misc. (1/2/73-8/31/73)	205.57
Revision of Fibre Test Manual	240.45
Legal Services & Expenses	4,015.68
Secretary's Travel Expense	442.30
ATI Meeting Expense	1,727.43
ASTM Dues	25.00
Insurance	237.00
Accountant (Caruso/Year ended Sep 1972)	300.00
Moving Expenses from N.J. to Pa.	111.30
Gifts, Flowers, etc.	162.40
Advertisement in July 1973 ASBESTOS	129.24
Petty Cash Vouchers #629-664 & #01-34	<u>291.74</u>

Total Disbursements \$ 13,119.77

BALANCE ON HAND AUGUST 31, 1973 . . \$ 16,118.56

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Report of Funds for Fiscal Year/September 1, 1972, thru August 31, 1973

Balance on Hand August 31, 1973 \$ 16,113.56

Funds as of August 31, 1973 --

General Fund	\$ 2,683.68
Reserve Fund	13,346.91
Petty Cash Fund	<u>87.97</u>

TOTAL AVAILABLE FUNDS AUGUST 31, 1973 . . \$ 16,118.56

Assets as of August 31, 1973 --

Total Funds as listed above	\$ 16,118.56
Accounts Receivable (Book Sales)	25.23
Furniture & Equipment (Nominal Value)	<u>1.00</u>

TOTAL ASSETS \$ 16,144.79

TOTAL LIABILITIESTOTAL NET WORTH \$ 16,144.79Doris M. FaganRespectfully submitted,
Doris M. Fagan,
Executive Secretary, ATI

ASBESTOS TEXTILE INSTITUTE -- ESTIMATED EXPENSES, INCOME AND BUDGET
FISCAL YEAR -- SEPTEMBER 1, 1973, thru AUGUST 31, 1974

	<u>Budget</u> <u>1972 - 1973</u>	<u>Actual</u> <u>1972 - 1973</u>	<u>Anticipated</u> <u>1973 - 1974</u>
INCOME:			
Members' Dues	\$ 14,250.00	\$ 14,250.00	*\$ 14,750.00
1972 Interest on Savings	450.00	506.23	550.00
Book Sales	200.00	311.78	300.00
Special Assessments	750.00	750.00	..
Voluntary Contributions	..	250.00	..
Insurance Credits	..	37.00	..
	<u>\$ 15,650.00</u>	<u>\$ 16,105.01</u>	<u>\$ 15,600.00</u>
EXPENSES:			
Legal Services/Expenses	\$ 5,850.00	\$ 4,915.88	\$ 5,000.00
Secretary's Gross Wages	2,824.00	2,400.00	2,100.00
incl FICA & NJ Unem Taxes	447.00	..	..
Unem/FICA Taxes paid by ATI	..	152.42	77.00
ATI Meeting Expense	2,500.00	1,787.48	2,000.00
Secretary's Travel Expense	450.00	442.30	500.00
**Office Expense & Misc.	1,350.00	..	..
Telephone	..	430.86	450.00
Printing & Office Supplies	..	245.53	..
Postage	..	199.49	300.00
Printing Services	..	138.11	200.00
Office Supplies & Misc.	..	205.57	300.00
Petty Cash	..	291.74	300.00
Revision of Test Manual	600.00	240.45	300.00
Rental of Office Space	900.00	705.00	540.00
Accountant (Caruso)	300.00	300.00	300.00
ASTM Dues	50.00***	25.00	25.00
Gifts/Flowers/Plaques/etc.	150.00	162.40	200.00
Insurance	108.00	237.00	250.00
Tumbler Testing Machine	..	..	500.00
Moving Expense	..	111.30	..
Advertising in ASBESTOS	..	129.24	..
	<u>\$ 15,529.00</u>	<u>\$ 13,119.77</u>	<u>\$ 13,342.00</u>
Excess of anticipated income over anticipated expenses -- for unanticipated or extraordinary expenses or Reserve ..			<u>\$ 2,258.00</u> <u>\$ 15,600.00</u>

***Members' Dues for F/Y 1973-1974:**

Class A	5@ \$1500.00 = \$ 7,500.00
Class B	2@ \$ 750.00 = \$ 1,500.00
Class C	4@ \$ 750.00 = \$ 3,000.00
Class D	7@ \$ 375.00 = \$ 2,625.00
Class D (prorated 1/3 year)...	1@ \$ 125.00 = \$ 125.00
	<u>\$14,750.00</u>

**Totals for breakdown of Office Expenses: Budgeted 1972-73 = \$1350.00
Actual 1972-1973 = \$1511.30
Budgeted 1973-74 = \$1550.00

***Included \$25.00 for dues in the Industrial Hygiene Foundation

FIBER PRODUCERS' REPORT

(Presented at ATI Annual Meeting, October 5, 1973, at Wychmere Harbor Club, Harwichport, Massachusetts)

In 1972, the United States again was the largest importer of 13,756 short tons of spinning fiber from Canada. The United Kingdom and Yugoslavia followed. Total shipments were down slightly to 29,000 tons, from 30,000 tons to 22 countries in 1971.

1972 Canadian Group 3 Shipments (Short Tons)

	<u>1972</u>	<u>1971</u>
United States	13,756	13,428
United Kingdom	5,329	6,001
West Germany	1,449	2,263
Yugoslavia	1,800	..
India	1,492	1,631
Japan	1,308	1,616
France	709	1,029
Italy	977	624
Mexico	559	588
Netherlands	28	530
Czechoslovakia	99	469
	<u>27,504</u>	<u>28,179</u>
Others	<u>1,686</u>	<u>2,222</u>
TOTAL	<u>29,190</u>	<u>30,401</u>
	<u>s.tons</u>	<u>s.tons</u>

The supply of Quebec spinning fibers is good but long Cassiar Asbestos grades are in short supply. The supply of fiber Groups 4 and 7 has been generally tight with Group 4 in short supply. Groups 5 and 6 are available. These conditions are expected to extend through 1974, in view of a strong and growing demand from Europe and Asia.

A recent survey of end uses of asbestos fibers in the U.S. issued by the Asbestos Information Association/North America shows consumption of fiber for textiles to be 3% of the total. The U.S. end-use breakdown is considerably different than the world breakdown as published in Industrial Minerals, January 1970.

World & United States Asbestos End Use Distribution -- % Tons

	<u>World</u>	<u>U.S.</u>
A-C Pipe & Building Materials	<u>70%</u>	<u>25%</u>
Floor Tile	10	18
Felts & Papers	7	14
Friction Products	3	10
Textiles	2	3
Packing and Gaskets	-	3
Miscellaneous	<u>8</u>	<u>27</u>
	<u>100%</u>	<u>100%</u>

Edward Asa Farrell, Sales Manager
Lake Asbestos of Quebec Ltd.

() M I N U T E S ()

AIR HYGIENE & MANUFACTURING COMMITTEE

Asbestos Textile Institute
October 4, 1973 -- Wychmere Harbor Club, Harwichport, Massachusetts

The Committee met with fourteen members and guests present and ten companies represented, as follows:

Amatex Corporation
H. H. Walter

Nippon Asbestos Co. Ltd.
Y. Sato

Canadian Johns-Manville Co. Ltd.
A. Morrill
J. P. Power

H. K. Porter Company, Inc.
E. C. Bratt
L. E. Moody

Garlock Inc.
S. G. Dixit

Raybestos-Manhattan, Inc.
R. T. Matthew
I. H. Weaver

Johns-Manville Products Corp.
C. G. Guerin

TBA Industrial Products Ltd.
H. J. Corson

Lake Asbestos of Quebec Ltd.
E. A. Farrell

Uniroyal, Inc.
B. E. Carden
L. F. Dieringer

The Committee had another good meeting and discussions included visits to four asbestos textile plants by the National Institutes for Occupational Safety and Health (NIOSH); plant inspections by the Occupational Safety and Health Administration (OSHA); and noise controls.

The main purpose of the NIOSH visit was to observe and discuss engineering controls and work practices directed at reducing the levels of asbestos fibers to which the workers are exposed in textile operations; also, to check fiber counts previously taken in all operations plus any data relating to a particular control or practice that produces a definite reduction in fiber counts.

While touring the plants, the NIOSH people made sketches of the various ventilation systems associated with the textile operations in all departments. The NIOSH group planned to take some air velocity measurements at major exhaust hoods and make some limited personal air sampling. However, this was not done at the Hogansville, Georgia, facility.

It is the Committee's understanding that the NIOSH people have selected two of the four plants visited to conduct approximately 600 dust counts derived from eight one-hour studies on fifteen people per day for one week. Additional one-week studies will be made in October following the initial week's visit.

Under the Occupational Safety and Health Act of 1970, NIOSH has the responsibility of conducting research for new occupational safety and health standards. NIOSH's recommendations are transmitted to

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the U.S. Department of Labor which has the responsibility for the final setting, promulgation and enforcement of the standards.

While we cannot be sure, it is generally felt that NIOSH is conducting the above-mentioned studies for use by the soon-to-be-constituted 15-member Review Board, when reviewing the existing Asbestos Standard. Hopefully, the result will be a more realistic Standard.

From one recent OSHA inspection, machine guarding, exposed horizontal shafting and signs for electrical equipment were the only items listed for correction. This plant was given a period from one week to 30 days to make the proper corrections and received only two very light penalties.

Only dust counts were made during an inspection at another plant. While it is generally felt that the initial impact from OSHA is behind us, we cannot afford to "let up" from doing everything possible to comply with the standards. However, OSHA is aware of the vast amount of improvement that is being accomplished by all plants toward the safety and health of their employees.

Present noise levels above 90 decibels require the use of protective ear plugs. However, there is some indication the 90 decibel-level may be lowered to 85. This is an area where OSHA may take a closer look in the future. It is felt that more work will be necessary to reduce noise levels and to eliminate the use of ear plugs.

In one plant, an employee who is not wearing ear plugs in a work area with noise over 90 decibels is given an oral warning; the second time, a 3-day send-out; the third time, a week send-out; and the fourth time, a discharge.

Respectfully submitted,

Buel E. Carden, Chairman

(M I N U T E S)

ASBESTOS ADVISORY COMMITTEE

Asbestos Textile Institute
October 4, 1973 -- Wychmere Harbor Club, Harwichport, Massachusetts

IN ATTENDANCE:

Amatex Corporation - M. J. Scanlan
Garlock Inc. - A. Kuzmuk
Nicolet Industries, Inc. - E. W. Russell
Raybestos-Manhattan, Inc. - M. Q. Scowcroft
Uniroyal, Inc. - W. C. Hitchcock, E. A. Morris and S. J. Peele
Asbestos Textile Institute - D. M. Fagan

There was considerable discussion by the Committee concerning the economic philosophy that exists today; that is, one of shortages and increased demands for all materials in the economy, the trend toward world demand and the ability to buy the materials and how these conditions affect the asbestos textile industry.

The publicity that asbestos receives is always a topic of discussion by the Committee. There was a general consensus of opinion that in spite of the adverse publicity directed at asbestos, the demand for asbestos textile products is continuing to increase. However, the industry must continue to make progress wherever possible, not just to avoid further criticism, but to continually improve upon its products and to reduce industrial health and safety hazards for its employees.

Respectfully submitted,

E. W. Russell, Chairman

M I N U T E S

TECHNICAL COMMITTEE

Asbestos Textile Institute
October 3-4, 1973 -- Wychmere Harbor Club, Harwichport, Massachusetts

IN ATTENDANCE:

Amatex Corporation - W. Maaskant
General Electric Co./ASTM - P. O. Nicodemus
H. K. Porter Company, Inc. - J. W. Echerd
Raybestos-Manhattan, Inc. - S. G. Ledbetter and W. A. Mitchell
Uniroyal, Inc. - D. T. Austin, Jr.

The Secretary of ASTM Subcommittee D13.14 reported that our proposed revisions to ASTM Standards for Asbestos Yarn (D299), Asbestos Roving (D375) and Asbestos Lap (D1061) have been approved by Letter Ballot. A Round Robin Test to determine Precision and Accuracy of these Standards is in process. Three of the five participating laboratories have completed the tests. All inter-laboratory testing is expected to be completed by January 1, 1974.

Revision of ASTM Standards for Asbestos Cloth (D1571), Asbestos Tape (D315) and Asbestos Tubular Sleaving (D628) will be undertaken next. The Precision and Accuracy of each Standard will be determined by a Round Robin Test.

ASTM Committee D-13 is scheduled to meet in New York City October 15-19, 1973. Subcommittee D13.14 will be represented by Messrs. P. O. Nicodemus and W. Maaskant on alternate days.

The Johns-Manville Tumbler Test procedure will be pursued as a means to determine the relative dustiness of various asbestos products. Five-hundred dollars (\$500.00) has been budgeted for the project. A location for the Tester will be determined at a later date. J. W. Hawkins, of Raybestos-Manhattan Inc., will investigate and recommend possible sites.

The Shaker Test was discussed as an alternate to the Tumbler Test method. No action was taken.

Proposed revisions to MIL-I-3053E, Insulation, Electrical, Asbestos-Fiber, Treated and Untreated, were reviewed. Committee recommendations will be submitted to the Military Custodian by the Committee Chairman prior to October 15, 1973.

Respectfully submitted,

J. W. Echerd, Chairman

MINUTES

FIBER RESEARCH & TESTING COMMITTEE

Asbestos Textile Institute
October 4, 1973 -- Wychmere Harbor Club, Harwichport, Massachusetts

IN ATTENDANCE: American Smelting & Refining Co. - C. E. Stiefken
Asbestos Corporation Ltd. - G. F. A. Brink
Bell Asbestos Mines Ltd. - W. H. Smith
Cassiar Asbestos Corporation Ltd. - R. A. Kuntze
H. K. Porter Company, Inc. - D. E. Childers

Work is progressing on the Chrysotile Asbestos Test Manual, 3rd Edition. Final typing of the new and revised tests, including the introduction (roughly 200 pages) is in process. This will be completed in early December after which we will submit the entire manuscript to U.S. printers for estimates.

Total estimated printed pages will be 375-400, or 200 sheets.
Total tests will be 31, of which 11 will be in ASTM format.

Some current printing estimates are as follows:

	<u>Canadian/as of 10/73</u>	<u>U.S./as of 7/73</u>
Printing & Assembling	\$3.69 per manual	\$3.17 per manual
Binders (includes 5-ring binder, printing via silk screen process, printed front cover & edge)	\$2.43	\$2.00
Spacers	<u>\$1.91</u>	<u>\$1.50</u>
TOTALS	<u>\$8.03</u>	<u>\$6.67</u>

Total manual orders placed at present are slightly over 2000. We anticipate an over-run of about 300 copies. It was recommended that any future modifications to the manual be under the control of ATI (in the interest of continuity).

Future work of this Committee will include the assistance to any other Institute Committee in the form of research projects.

We again are asking for more representation among fiber consumers on the Fiber Research and Testing Committee, as we are heavily over-balanced in the direction of fiber producers.

Respectfully submitted,

C. E. Stiefken, Chairman

() MINUTES ()
ENVIRONMENTAL HEALTH COMMITTEE

Asbestos Textile Institute
October 4, 1973 -- Wychmere Harbor Club, Harwichport, Massachusetts

No formal meeting of the Committee was held and the two members present (E. C. Bratt and L. F. Dieringer) sat in on the discussions of the Air Hygiene and Manufacturing Committee.

As of meeting time, the following is the status of various proposed OSHA health standards which are of interest to member companies:

- 1) Asbestos - A Department of Labor Standards Advisory Committee has not been selected to consider revision to the present Standard. There is some indication that the DOL will by-pass use of this Committee and publish a proposed revised Standard in the Federal Register and then follow with the usual hearing and enactment process;
- 2) Noise - A revised standard is expected to be issued in the near future. It appears that the present 90 dBA limit for daily eight-hour exposure will be retained, that hearing testing will be required where exposure exceeds 85 dBA, and that the definition of engineering control will be changed to include practical and economic considerations. This indicated latter change is important and it gets away from the strict present concept that if the noise can be engineered out, it must be, without considering other factors;
- 3) Heat Stress - The Standards Advisory Committee is still considering a standard on heat stress. There are indications that because of the many controversies over the various provisions of the standard, it may be allowed to die on the vine.

Of interest is a recent law suit in which an industrial worker's law suit against six firms which manufactured the asbestos-containing products he installed, was upheld by a Circuit Court of Appeals. The case, Borel v. Fiberboard Paper Products Corporation, resulted from a suit involving a worker who died from lung cancer which the court said resulted from his work with asbestos over a 33-year period. The worker's complaint was based on the failure of the manufacturers of asbestos with which he worked to warn that their product could be dangerous to the ultimate user. The judge, in the court opinions, said that since the dangers of asbestos were known to the medical community since 1924, the manufacturers had a duty to inform purchasers and ultimate users of the product's inherent dangers, which they had not done.

Recent articles of interest are:

- 1) "Improved Techniques of Identification and Determination of Airborn Asbestos," L. Bartosiewicz, American Industrial Hygiene Association Journal 34, page 252, June 1973;
- 2) "Asbestos," National Safety News 108, page 54, August 1973.

Respectfully submitted,
L. F. Dieringer, Chairman

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REMARKS OF LEGAL COUNSEL

Asbestos Textile Institute Annual Meeting
October 5, 1973, Harwichport, Massachusetts

Two weeks ago the business community experienced a shock wave produced by a federal court in an antitrust suit. I suppose that businessmen have become amply aware of the significance of the law in business affairs. But when I.B.M. was ordered to pay Telex \$352-1/2 million, even the lawyers were amazed.

Judge A. Sherman Christensen, sitting in Tulsa, Oklahoma, ruled on September 17, 1973, that the International Business Machines Corporation illegally monopolized the market for "plug compatible peripheral equipment" comprising such items as memories, tape devices and printers that plug directly into the main processing units of computers.

The suit by Telex is one of several brought against the giant of the computer industry. The Antitrust Division of the Federal Government is going directly for the jugular, suing I.B.M. in New York for monopolizing the market for general-purpose digital computers. Other suits have been brought by Controlled Data Corp., Greyhound Computer Leasing Corp., and others.

One body of opinion considers this series of cases to be an unwarranted attack on bigness itself. I.B.M. is being sued according to this view, simply because it has obtained a large share of the computer market, and the plaintiffs are oblivious to the natural and even praiseworthy reasons for I.B.M.'s growth. The law, however, does not make bigness alone illegal. The Sherman Act, Section 2, makes monopolization illegal, not the mere possession of monopoly power. "Monopolization" is a technical legal term which includes bigness plus an intent to acquire a monopoly.

A suit based on monopolization can succeed only if it is proven, first, that the defendant possesses monopoly power in a particular market, and, second, that it has obtained or maintained this power through willful action, such as anti-competitive pricing practices rather than through the excellence of its products or management. To differentiate excellence of management from willful exclusion of competitors is, of course, extremely difficult. Professor Martin Shubick, an economist at Yale and formerly of I.B.M., has said that the question is so difficult in the Government's suit against I.B.M., for example, that if he were offered a high enough consulting fee, he would be willing to work for either side in the suit in "perfect comfort and utter objectivity."

Nevertheless, the Supreme Court of the United States believes that the distinction can be made and that serious legal consequences may properly result. In the case of United States v. Grinnell Corp., 384 U.S. 563, 570-71 (1966), the Supreme Court stated that:

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"The offense of monopoly under P2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident."

This statement of the law reflects a very widely held sense of fairness. Why should the enterprise that Thomas J. Watson, Sr. built up be penalized, and even split up as the Justice Department would like, if only the best business techniques were the cause of its success?

In a letter to the Editor of The New York Times Magazine, printed on August 19, 1973, an anonymous I.B.M. employee wrote of I.B.M.'s record of technological achievement, stating that "... hard-headed businessmen buy I.B.M. products because of superior performance and service. I.B.M. has been able to aspire to this kind of superiority and keep ahead of its competitors by motivating its employees to regard excellence as a worthwhile goal. ... Why, then, penalize excellence by trying to 'break-up I.B.M.'?" (p.64)

Judge Christensen, for one, has reached the conclusion that I.B.M.'s success is due to some less commendable practices as well. He found that I.B.M. tried to "substantially constrain or destroy its plug peripheral competition by predatory pricing actions and by market strategies bearing no relationship to technological skill, industry, appropriate foresight or customer benefit."

Situations of monopoly may arise in various ways. They may result, on the one hand, innocently from the supremacy of the monopolist as victor in a race of competition, by reason of his technical superiority, or his ownership of an important patent. Monopoly may develop, on the other hand, from the absorption of competitors in an illegal merger. Or monopoly can emerge by driving competitors out of business, by putting deliberate business impediments in their path, or by combining or conspiring with competitors.

Clearly, an unlawful monopoly exists if monopoly power has been established or maintained by means of restraints of trade which would in themselves be illegal under the Sherman Act. Also, if there is proof that the defendant's business policy, his subjective intent, is to acquire or to keep a monopoly position, the law is violated. However, Judge Learned Hand has said that "... no monopolist monopolizes unconscious of what he is doing." Aluminum Co. of America v. United States, 148 F.2d 416, 432 (2d Cir. 1945). Therefore, some business practices will lead the courts to conclude that the company involved must necessarily have intended to acquire a monopoly.

In fact, it is very difficult for a company which possesses monopoly power to prove that it did not intend to monopolize. It is required

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to come forward with substantial evidence that the monopoly was "thrust upon" it. Alcoa raised this defense in 1945, but it was rejected by Judge Hand, who stated that:

"It was not inevitable that it (Alcoa) should always anticipate increases in the demand for ingot and be prepared to supply them. Nothing compelled it to keep doubling and redoubling its capacity before others entered the field."
(148 F.2d at 431.)

Very little indeed is required to show that the monopolist intended to obtain a monopoly.

In 1953 the United Shoe Machinery Corp. was held liable for illegal monopolization. United States v. United Shoe Machinery Corp., 110 F.Supp. 295 (D. Mass. 1953), aff'd per curiam, 347 U.S. 521 (1954). Its monopoly of machines used in manufacturing shoes was found to have been obtained in part through a system of leasing and not selling its machines. The District Court held that the lease-only and certain other practices

"... represent something more than the use of accessible resources, the process of invention and innovation, and the employment of those techniques of employment, financing, production, and distribution, which a competitive society must foster. They are contracts, arrangements, and policies which, instead of encouraging competition based upon pure merit, further the dominance of a particular firm. In this sense, they are unnatural barriers; they unnecessarily exclude actual and potential competition; they restrict a free market."
110 F. Supp. at 344-45.

Some of the cases referred to above have been misunderstood at times to suggest that a company which has monopoly power may become liable for unlawful monopolization merely by being active, enterprising and dynamic. Such a view implies that the safest course for large companies is passive stagnation, with a gradual loss of market share -- a business policy directly at odds with the aims of antitrust law. This, however, is not the teaching of the cases referred to. Enterprise alone is not penalized; the maintenance of monopoly power by policies intended to discourage, impede or even prevent the rise of new competitors is where the courts have drawn the line.

Returning to the recent judgment against I.B.M. for more than a third of a billion dollars, the court's opinion reveals that I.B.M. adopted certain practices which, according to the Judge, were "directed not at competition in an appropriate competitive sense, but at competitors and their viability as such." Among these were the bundling of prices of I.B.M.'s memories with its central processing units, that is, charging a single price for both items, and

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predatory pricing. Therefore, the District Court in the Telex case held the conviction that it was not penalizing excellence as such, or even bigness.

Although the standards governing the illegality of monopolies are, in my opinion, fair and economically beneficial, their application to any particular company is a mystery to all outside observers because of the factual complexity of such cases.

The number of dollars involved in the I.B.M. judgment is almost equaled by the number of documents, let alone testimony of witnesses, which are involved in this type of litigation. We all can take comfort in the fact that even though we do not have \$352-1/2 million to lose, neither must we endure a suit based on monopolization.

Thank you very much for your attention.

Eugene J. Leff, Attorney
CADWALADER, WICKERSHAM & TAFT

ABOUT THE SPEAKER

Alison D. McDonald, M.D., is Associate Professor, Department of Epidemiology and Health, McGill University - - and on a part-time basis is Consultant Epidemiologist, Hopital Riviere-des-Prairies.

British born and a citizen of Canada, Dr. McDonald studied at the Medical School of the Royal Free Hospital, University of London; the London School of Hygiene and Tropical Medicine; and the Harvard School of Public Health. Her academic qualifications are M.R.C.S., L.R.C.P., M.B., B.S., D.C.H., D.P.H., M.D. (Hygiene), and Certification in Public Health.

The latest responsibilities during her 23 years of experience prior to becoming associated with McGill, were: Industrial Medical Officer with the Navy, Army and Air Force Institutes; and Research Associate and Senior Lecturer, Paediatric Research Unit, Guy's Hospital Medical School, London Univ.

The author of no less than 26 papers, Dr. McDonald also has co-authored 19 publications, including:

- Epidemiology of primary malignant mesothelial tumours in Canada;

- Mortality in the chrysotile asbestos mines and mills of Quebec;

- Malignant mesothelial tumours: Histological type and asbestos exposure;

- Health of chrysotile asbestos mine and mill workers of Quebec;

- Epidemiologic surveillance of mesothelioma in Canada.

We are especially pleased to welcome Dr. Alison D. McDonald to the podium. The provocative title of her presentation is. . .

CHRYSOTILE - HOW REASSURING THE MINING EXPERIENCE?

CHRYSOTILE -- HOW REASSURING THE MINING EXPERIENCE?

By: Alison D. McDonald, M.D., D.P.H.
Department of Epidemiology and Health
McGill University, Montreal, Quebec

Presented to the Asbestos Textile Institute at its Annual Meeting held October 5, 1973, at Wychmere Harbor Club, Harwichport, Mass.

What are the health risks associated with working with asbestos? In quantitative and qualitative terms -- What is the relationship between amount and type of exposure and amount and type of disease? Although a great deal of research has been done on the subject, the picture is still fairly incomplete because the main evidence has to come from observations on man -- on people who are known to have been exposed to the mineral. Other investigations, such as animal experiments, do a lot to add to the picture but the evidence basically depends on what disease occurs in man and with what exposures. It is complicated, as you realize, by the different varieties of fibers, and because each fiber type may affect health differently. But I will try to give you some picture of the present state of knowledge, which is, on the one hand, complicated, and on the other, uncertain.

*Slide 1 shows the main types and quantities of asbestos produced and the time period over which they have been produced. It also shows the different uses for the mineral.

The first hazard to be observed was asbestosis. In quantitative terms -- What is the risk of contracting asbestosis? How much dust exposure, and over how long a period of time, is necessary before there is a risk of getting asbestosis?

The matter is still rather poorly assessed, except in the study we have been doing in Quebec where we do now have, for chrysotile mining, a fairly good picture of the amount of exposure which will give rise to asbestosis. It appears that all types of fibers and all types of processes (all industrial groups) are at risk of asbestosis.

The problem really lies in lung cancer. There are two main cancers that are associated with asbestos -- lung cancer, which is really indistinguishable from the lung cancer that smoking can give you; and mesothelioma, which is a very rare tumor that involves the surface of the lung and the lining of the abdominal cavity. A very definite connection has been observed between asbestos exposure and mesothelioma.

*The only slides available for reproducing in this written account are shown as Tables 2 through 9.

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Chrysotile -- How Reassuring the Mining Experience?

TABLE I
Main Industrial Groups and Fiber Exposure

	<u>Chrysotile</u>	<u>Crocidolite</u>	<u>Amosite</u>	<u>Antho- phyllite</u>	<u>Mixes</u>
Mining	±	++?	?	±	N/A
Manu- facture	++?	Not Known	++	Not Known	++
Insu- lation	Not Known	Not Known	Not Known		++

Table I. I'm proposing to look at this in three main industrial groups: mining, manufacture and insulation -- and at the fiber types concerned, i.e., chrysotile, the three main amphiboles, and mixed fiber exposures. Unfortunately, the latter group is the most common.

When we started our studies in Quebec; it was known that very substantial risks of lung cancer and mesothelioma were found in the manufacturing processes and in people working with insulation. This is particularly true for mesothelioma which is very rare and only occurs in one out of a million population -- and yet a substantial number of cases are found with certain asbestos exposures.

Substantial health risks in terms of mesothelioma and lung cancer have been well documented for mixed fiber exposures. When we began our studies in Quebec, there was little evidence of a serious problem in the Chrysotile mining industry.

It was, therefore, very important to look at groups of people who were exposed to only one type of fiber. So we started investigating all persons who had ever been employed in the Quebec chrysotile-producing industry. The main objective, apart from studying pure Chrysotile exposure, was to determine the dose response relationship; that is to say, to try to get some precise information about what exposures could be sustained without a significant risk to health, and at what level was there a significant amount of disease.

As you know, the two main asbestos mining areas in Quebec are Asbestos and Thetford Mines. Slide 2 is a photograph of Canadian Johns-Manville's Jeffrey Mine at Asbestos. Slide 3 is a picture of Smith Street, in Thetford, which is indicative of the extensive environmental exposure to people, locally.

Slide 4. In starting our survey, we obtained personnel records of all of the people who ever had worked in the mines and mills. We documented all of their jobs, recorded as well as possible the amount of dust to which they had been exposed, and allowed for the time during which they had been exposed to these levels. We then divided all of these people into groups, according to the amount of dust exposure.

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TABLE II
Dust Exposure Levels and Numbers in each Analysis

Dust Exposure (mpcf - years)	-10	10-	100-	200-	400-	800+	
Number of Men in Each Analysis							<u>Total</u>
Mortality Study	2810	3329	1124	1007	837	585	9692
Radiographic Study	1537	1522	1133	912	718	707	6529
Lung Function and Respiratory Symptoms	91	455	159	134	109	67	1015
Smokers	69	381	144	117	96	59	866
Non-Smokers	22	74	15	17	13	8	149

The above Table II/Slide 5 shows the extent of the study. Looking at the top line, we have six groups, ranging from a total of less than 10 million particles per cubic foot x years through 800 plus. If you take a lifetime of 50 years of employment, the last group on the right would be equivalent to exposure to an average of at least 15 million particles per cubic foot. This is a very heavily exposed group and, of course, such exposures have only happened in the past and do not occur at the present time. Dr. Graham Gibbs, of the Department of Epidemiology and Health, has been studying the correlation between fiber counts and particle counts and we do not find sufficient correlation between the two to give our findings in terms of fiber counts. For this reason and because all epidemiological information is in terms of particle counts, we consider that these should continue to be used until fiber counts have been done for a long period of time. We do not have any direct information about fiber levels in terms of risks of disease.

One of the three major studies we undertook was of all men born between 1891 and 1920, to study causes of death and what their death rates were in various dust categories. We did an x-ray study in order to determine which dust groups showed an increased incidence of x-ray changes and at what level the increase started. This, of course, was important evidence of disease. Laboratory equipment was moved down to the mining areas and 1000 men were submitted to detailed lung function studies, again to see what the relationship was between the amount of chrysotile dust to which the men had been exposed and changes in their lung function. Slides 6 & 7 show the apparatus that was used to test their lung functions.

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TABLE III
Age-Corrected Mortality by Cause Per 1000 Men
Born 1891-1920 -- Deaths to December 1969
Dust Group

mpcf - years	-10	10-	100-	200-	400-	800+
All Causes	365	355	354	313	323	395
Respiratory Cancers, including malignant pleural mesothelioma	10.3	13.1	13.4	15.5	21.4	32.1
Abdominal Cancers	18.0	13.6	18.7	11.6	26.3	28.7
Pneumoconiosis	1.6	1.5	0.8	4.9	4.9	23.6

Table III/Slide 8 shows the main results of the mortality study. Of all causes of disease, it was only in the highest dust group (800+) that there was a considerable excess of deaths. For respiratory cancers, which includes malignant pleural mesothelioma of which there were very few cases in the industry, a rise is clearly present in the 400 to 800+ dust groups with an exposure (to an average concentration of 8 mpcf over 50 years). The rise probably does begin a little earlier. The highest dust group, which as we said was very heavily exposed, has about 3 times as much respiratory cancer as do the people with minimal exposure (the less than 10 group). The latter group includes people such as those working in clerical jobs and who have virtually no exposure to asbestos. But having information for both groups gave us a population with which to compare the people who were substantially exposed to dust.

There was also some indication that abdominal cancers were related to dust exposure. You will see a higher amount of abdominal cancers in the 400 to 800 and the 800+ groups. The same experience has been observed in other studies. It is by no means certain that this is directly due to asbestos since there are other possible explanations. You will see that the rise in asbestosis occurs at around the 200 dust level, indicating an equivalent of an average of 5 mpcf over 50 years.

Table IV/Slide 9. What is thought to be significant disease is irregular small opacities of grade 2/1. For those cases we observed that a significant increase occurred in the 100 to 200 dust group. We conclude, that for a lifetime exposure, an average of 2 mpcf gives rise to radiological change indicative of significant disease in 1% of persons.

Slide 10. In lung function tests in cigarette smokers and non-smokers, the first change occurred in the capacity to breath in and this started with low levels of dust exposure. But a 10% deficit in breathing capacity occurred at about the same level as the radiological changes that I just talked about -- at the level of about 2 mpcf on average over a lifetime.

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Chrysotile -- How Reassuring the Mining Experience?

TABLE IV

Radiographic Changes - Prevalent Rates (%) Standardized for Age and Years in Industry -- Males Aged 36-65 at time of Radiograph

mpcf - years	Dust Group						Average
	-10	10-	100-	200-	400-	800+	
Thetford Mines							
Irregular Small							
Opacities - - - 1/0	1.8	3.3	6.3	8.7	12.0	17.2	7.6
2/1	0.0	0.2	2.2	0.9	2.4	9.2	2.0
Pleural Thickening-							
Grade 1	2.4	4.6	6.5	5.8	8.3	10.5	6.4
Grade 2	1.3	0.7	0.8	1.2	1.3	2.0	1.1
Asbestos							
Irregular Small							
Opacities - - - 1/0	6.4	3.7	6.3	5.0	6.8	7.0	5.1
2/1	0.0	0.4	1.5	0.8	0.6	3.9	0.8
Pleural Thickening-							
Grade 1	2.9	2.6	3.0	3.0	4.7	5.8	3.2
Grade 2	0.0	0.6	1.0	0.5	1.4	0.7	0.7

TABLE V

Age-Corrected Prevalence Rates (%) for Bronchitis and Breathlessness by Dust Exposure & Cumulative Smoking Habits

mpcf - years	Dust Index					
	-10	10-	100-	200-	400-	800+
Bronchitis						
Never Smoked	10	19	19	46	21	49
Up to 100 Cigar-						
ette Years	18	0	12	0	46	0
100-499	41	28	21	33	42	43
500-999	32	38	44	28	47	58
1000	100	47	45	55	54	35
Breathlessness						
Never Smoked	0	14	24	31	13	44
Up to 100 Cigar-						
ette Years	0	12	39	21	41	43
100-499	16	14	8	20	42	18
500-999	9	19	21	19	14	39
1000	0	23	27	31	34	46

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Table V/Slide 11. Lastly, the workers were asked to fill in a questionnaire about smoking. From the answers, we found that there was a relationship between breathlessness and dust exposure not apparently affected by smoking. But if you look at bronchitis and along the line for the "never smoked" and the two groups of smokers, you will note there wasn't any change in bronchitis which increased asbestos dust exposure. Now, if you look at the columns vertically you will see that smoking does a lot of damage in terms of bronchitis

TABLE VI

Distribution of Cases of Mesothelioma by Year of Death and Province
(1960-1970)

	<u>Ontario</u>	<u>Quebec</u>	<u>Other Provinces</u>	<u>Canada</u>
1960	0	6	9	15
1961	1	6	3	10
1962	4	4	5	13
1963	9	3	7	19
1964	6	8	3	17
1965	7	7	5	19
1966	8	14	9	31
1967	6	13	6	25
1968	7	18	7	32
1969	12	7	6	25
1970	9	16	5	30
	<u>69</u>	<u>102</u>	<u>65</u>	<u>236</u>
Annual Incidence Per Million Popu- lation 1966-1970	1.2	2.3	0.9	1.4
Reviewed by Pathology Panel	57	80	47	194
Accepted as Mesothelioma	71%	42%	57%	55%

Table VI/Slide 12. The other study we did was to survey all mesotheliomas in Canada. At the outset, I should say we had just 5 mesotheliomas out of 3270 deaths in the mining industry. Although this may seem to you to be a small number, there should be no cases of mesothelioma in a general population. One of the problems about mesothelioma is the diagnosis. There is by no means agreement among pathologists about the diagnosis of mesothelioma; so our finding of 5, having searched pretty thoroughly for mesotheliomas, may well be an over-estimate, especially because they were particularly looked for in people with known asbestos dust exposure. Having found very few in the industry, we did a concurrent study -- locating all the mesotheliomas we could in Canada. We obtained from all pathologists reports about all known cases and feel we got fairly full ascertainment. The ascertainment wasn't done until 1967-68. If you look at the graph at the top (Table VI) you will see a gradual rise in the annual number of mesotheliomas across Canada up to 1966. This is

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probably due to poor memory and lack of knowledge about mesotheliomas in these earlier years. We are continuing this surveillance, and between 1966 and 1970 there doesn't appear to have been any change. This is rather a short period of time and we obviously need to know whether this "no change" situation will continue. As you know, the big concern is the lengthy latent period for mesothelioma to develop and the widely expressed fear that we are now going to reap results from exposures which occurred 20-30 years ago and that the rate of mesotheliomas may rise.

We now feel quite happy that a fairly good base line has been established for this surveillance and we shall be able to know within the next few years what is happening in Canada. If you look at the bottom line (Table VI), we looked to see whether mesothelioma occurred more in one part of Canada than in other sections of the country. There was, in fact, more in Quebec -- over 2 per million population, compared with just over one in Ontario and slightly less than one in the rest of Canada. But we must revert to the question of the diagnosis. When the mesotheliomas were submitted to pathologists, a much lower proportion was accepted as mesothelioma by the pathologists' panel -- not only in Quebec but in all of Canada. It looks as though, for cases that are accepted by the panel as mesotheliomas, there is little or no difference in the various parts of Canada.

TABLE VII

Distribution by Age of Cases and Matched Controls

(The number in parentheses designates those successfully investigated, epidemiologically)

Age (Years)	Men		Women	
	Cases	Controls	Cases	Controls
20-29	0 (-)	0 (-)	2 (2)	0 (-)
30-39	3 (2)	2 (2)	4 (4)	4 (4)
40-49	6 (5)	6 (6)	4 (4)	5 (5)
50-59	12 (12)	12 (11)	6 (6)	5 (5)
60-69	8 (8)	10 (10)	6 (6)	8 (8)
70-79	7 (7)	5 (5)	7 (7)	8 (8)
80-89	2 (2)	3 (3)	3 (3)	2 (2)
90-99	1 (1)	1 (1)		
Total	39 (37)	39 (38)	32 (32)	32 (32)
Mean	58.7	59.2	58.9	59.0
Standard Deviation	12.9	13.2	18.2	15.2

Table VII/Slide 13. There are two objectives in this mesothelioma study -- to continue to watch the incidence and to examine to what extent the mesotheliomas are caused by asbestos. Here you see that more than 2/3 of the cases are in males, as is expected, and

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Chrysotile -- How Reassuring the Mining Experience?

that the high rate occurred at the ages in which you would expect to find the results of occupational exposure -- ages 50-70.

TABLE VIII
Average Daily Number of Cigarettes Smoked
(Figures in parentheses represent percentages)

Cigarettes per day	Men		Women	
	Cases	Controls	Cases	Controls
Nil	7 (19.4)	8 (21.1)	14 (45.2)	22 (68.8)
10 or less	6 (16.7)	4 (10.5)	5 (16.1)	5 (15.6)
11-29	18 (50.0)	17 (44.7)	8 (25.8)	3 (9.4)
30 or more	5 (13.9)	9 (23.7)	4 (12.9)	2 (6.3)
Totals	36*	38	31*	32

*Excludes 1 man and 1 woman whose smoking histories were not recorded

Table VIII/Slide 14. We compared the cases that we found with other cases of cancer from the same hospital, by inquiries to their relatives about their occupational histories. We then categorized the occupational histories as having either definite, probable, possible or unlikely exposure to asbestos. For both males and females, the mesothelioma series and the control series represent what happened to the people who did not get mesothelioma but perhaps had a similar type of death. You will note that only 20% of the male mesotheliomas in Canada had a definite or probable history of exposure to asbestos. There was no evidence that possible exposures were associated with mesothelioma because the controls included a similar number. For women who were found to have mesotheliomas, asbestos appeared to be almost non-existent as a causative factor. We simply do not know, as yet, what factors cause these mesotheliomas.

Table IX/Slide 15. When we analyzed the occupations that involved asbestos exposure, we again had cases and controls. You can see that in mining and milling there was an excess in the cases compared with the controls. However, we found the manufacture of asbestos products and insulation work in Canada appeared to be the main causes of mesothelioma. We found none of these occupations in the controls. Mining and milling of chrysotile was associated with mesothelioma, but compared with the other occupations (insulation & manufacture), it was unimportant. In view of the extensive neighborhood exposure, especially at Thetford, we inquired whether any people had mesothelioma who were not employed in asbestos production but who were living in the area. We found no such cases.

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Chrysotile -- How Reassuring the Mining Experience?

TABLE IX
Types of Occupation in which there was
Definite or Probable Asbestos Exposure

	Men				Woman			
	<u>Occupational</u>		<u>Domestic</u>		<u>Occupational</u>		<u>Domestic</u>	
	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
Mining & Milling	1	--	1 father	--	--	--	1 father	--
Asbestos Products Manufacture	4	--	--	--	--	--	--	--
Insulation Work	2	--	--	--	--	--	3 1 father 2 husbands	--
Other Occupations	4	4	--	--	--	--	--	1 husband

Table IX: If you will look at the top line, you will note that we did find some indication of domestic exposure. There were a few people who had been exposed to a father or a husband working with asbestos. The diagnosis of mesothelioma may be more likely to be made in such a situation, but nevertheless, this risk is probably real and, especially for children. But there is no indication that the general population is at any risk.

So we found that the mesothelioma study backed up what we found in the mining industry, namely that there is a small excess of mesotheliomas in mining but it was manufacture and insulation that were mainly associated with mesothelioma in Canada rather than the mining and milling of chrysotile.

This has been borne out in other studies of chrysotile mines in Cyprus, Northern Italy and the USSR. Although the information is somewhat incomplete, they indicate a similar experience to that found in Quebec with regard to lung cancer and, in fact, practically no mesotheliomas. The evidence, insofar as the chrysotile-producing industry goes, is good in that the risks are low, and probably controllable.

Now, referring back to Table I -- I'm going to put a + for chrysotile mining. For anthophyllite mining in Finland, the picture is similar in that they find no mesotheliomas in that country. There does appear to be some lung cancer associated with mining but it isn't the high rate that appears in manufacturing and in insulation work.

Our information about crocidolite and amosite mining is fragmentary because it doesn't depend on surveys of people working in the mines. It depends, rather, on a surveillance of all types of cases which come from the mines and surrounding areas.

It does appear, however, that there have been a substantial number of mesotheliomas around crocidolite mines in the Northwest Cape. So, I'll put a ? for crocidolite mining (Table I) because the evidence isn't too secure, especially in regards to rates; i.e., how many cases in relation to how many workers and residents.

Regarding the amosite mines in the Transvaal, there is a very minute + (Table I). There does appear to be some lung cancer but practically no mesothelioma -- which is very different from the Northwest Cape area.

The relationship between mesothelioma and chrysotile has been confirmed in studies by the electron microscope -- studies in which fiber types in the lungs of cases of mesothelioma have been identified by Dr. Fred Pooley, of Cardiff in South Wales. In these studies, practically all of the fibers detected were of the amphi-

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Chrysotile -- How Reassuring the Mining Experience?

bole variety. So far it has not been possible to distinguish crocidolite from amosite fibers, but chrysotile can be detected. All the cases thus far examined have substantial amounts of amphibole fibers and relatively few chrysotile fibers.

There are reports that persons exposed to chrysotile only in the manufacture of asbestos, have had similar rates of mesothelioma and lung cancer to those found in persons exposed to a mixture of fibers. The evidence isn't any too sure, in fact it's pretty doubtful, that these men were exposed only to chrysotile. So, we must put a ? (Table I) against the risk of cancer in the manufacture of asbestos products using only chrysotile.

Some additional comments to the data in Table I: Dr. Selikoff reports a high rate of mesothelioma and lung cancer in persons exposed only to amosite. Information on the manufacture of anthophyllite is unknown because single types of fiber have not been used in the process. Mixed mining is not applicable. And, we lack satisfactory information about manufacturing with pure crocidolite or with pure anthophyllite.

As you know, there are differences in the nature of each fiber type but experimental work has produced some possible explanations of the varying effects. Chrysotile is a long, thin and curly fiber and there is some evidence that it easily gets held up in the larger airways and, therefore, does not penetrate so well as other fiber types which can enter the smaller airways and reach the pleural surface.

In comparing crocidolite and amosite fibers, both are straight, rather than curly. However, when mined they apparently have quite different diameters; crocidolite having the narrower diameter and amosite being much wider in diameter. This fits in quite well with the findings from studies in the Northwest Cape. There are a lot of mesotheliomas in the Northwest Cape where the diameter of the fibers is small; whereas in the Transvaal area, where amosite is mined, and the fibers are broad, there appear to be practically no mesotheliomas. This doesn't fit with the story of the manufacture of amosite, and, frankly, I really do not know the reason.

Fiber differences could be an explanation; but on the other hand, the big differences between chrysotile mining and the manufacture of asbestos products and insulation certainly cannot be laughed off. Some of the possibilities for the differences between chrysotile mining and manufacture and insulation are

- 1) It is possible that during manufacture the fibers may be broken up into much smaller pieces and, therefore, lose their capacity to be caught up in the bigger airways, thereby penetrating further into the lungs.

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- 2) It is possible that the culprits are crocidolite and/or amosite.
- 3) It also is possible that in the process of manufacturing and insulation, that other carcinogens are involved.

Smoking has been raised as a possible additional factor in causing cancer of the lung; but for mesothelioma it has been pretty clearly shown that smoking is not an added factor. If there is something else that increases the risk of mesotheliomas, it is not smoking.

So I have to conclude that the chrysotile mining experience cannot really be said to be reassuring. It is certainly possible that if one were able to show that the manufacture of pure chrysotile gave cancer rates, similar to those in mining and milling, the picture would certainly be brighter.

But, it isn't brighter at the moment!

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