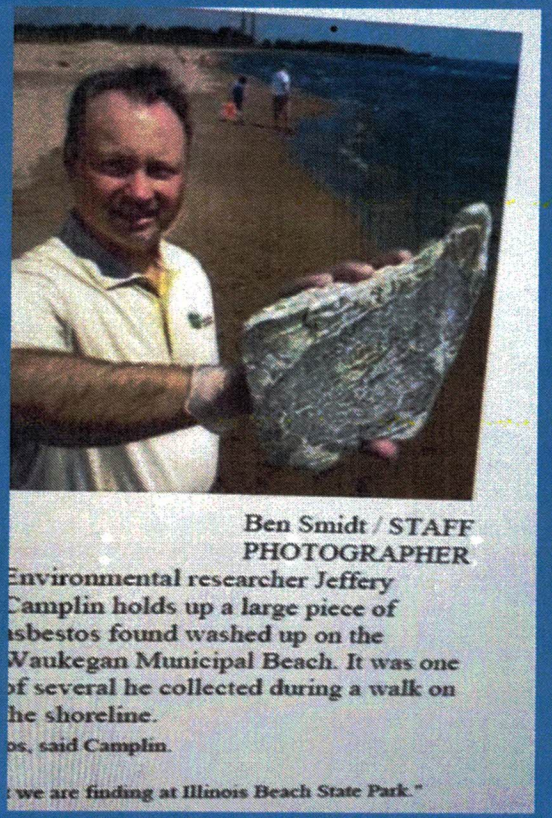
Asbestos:
A Beginner's Primer



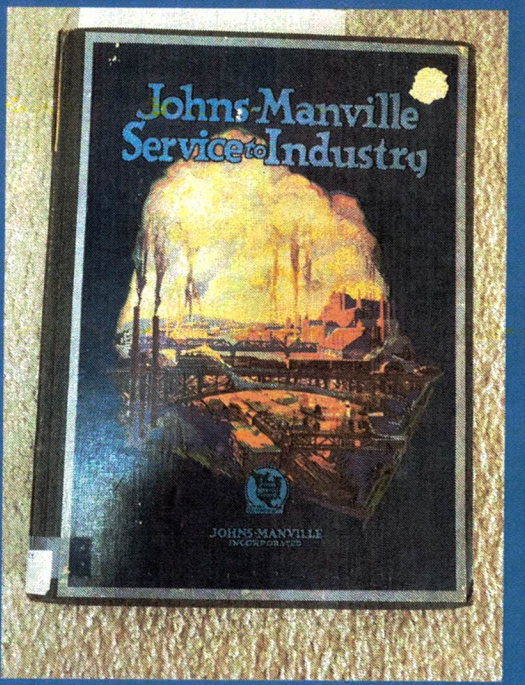
Ben Smidt / STAFF PHOTOGRAPHER.
Environmental researcher Jeffery Camplin holds up a large piece of asbestos found washed up on the Waukegan Municipal Beach. It was one of several he collected during a walk on the shoreline.
os, said Camplin.
we are finding at Illinois Beach State Park."

By: Martin Ditkof

April 8, 2025

Eight Areas we will Generally Discuss

- Why I do this
- General responses to typical questions
- Pre-Industrial revolution
- Six types of asbestos and 400 potential types of asbestiform
- Naturally occurring asbestos including in Colorado Springs
- History of asbestos mining, locations, and processing
- Transformation from 'Magic Mineral' to social pariah
- Relationship to talc, vermiculite(Libby), and similar fibers



Why I do This

- My Father died from an asbestos caused cancer known as Mesothelioma in 1981
- I was General Counsel of a manufacturing company defending against asbestos cases
- Self-Employed Attorney including defense of asbestos lawsuits, 22 Years
- December 2020 at www.TheAsbestosBlog.com, Asbestos-related blogs weekly
- Masters of Arts in History at UCCS focusing on asbestos. Graduated in December 2024
- Attending CU – Boulder in History PhD Program beginning August 2025. Will focus on toxic asbestiform fibers in occupational settings

Asbestos is Fiberous

"To the scientist, asbestos is a physical paradox, being both fibrous and crystalline. It is a rock that may be spun into yarn — a yarn that can be woven into a soft flexible cloth that will not burn. Asbestos thus becomes a connecting link joining the animal and vegetable kingdoms with the realm of minerals." Bowles, Oliver. *Asbestos: The Silk of the Mineral Kingdom,* The Ruberoid Co. 1946, Cover Page and p5.

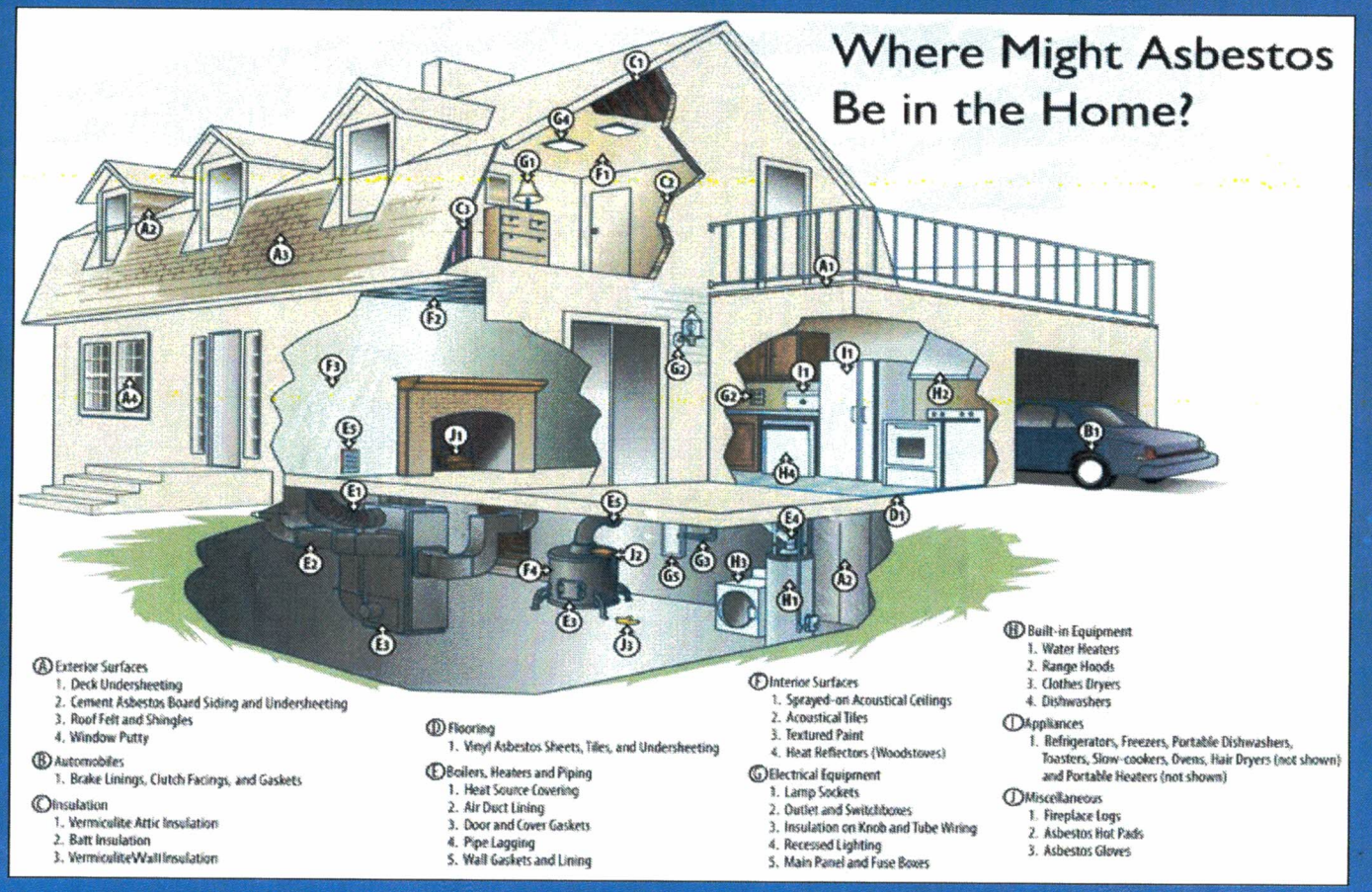
General Responses to Typical Questions

- Asbestos is the largest occupational killer in the United States and globally
- W.H.O. estimates 50% of the occupational cancers are caused by asbestos
- Mesothelioma, a cancer primarily arising from exposure to asbestos, is a horrible and painful way to die
- Global Issue hitting hard at England, Australia, Belgium, Netherlands, Italy, the United States, and all less developed countries
- Can Mesothelioma be caused by factors other than asbestos exposure
- Extensive books, reports, journal articles, symposiums and conventions
- A lot of money is spent; sometimes, financing influences results and trust
- Air sampling, waste sampling, and the lab work is for those trained
- Asbestos Containing Material – the 'less than 1% rule' and how that is dealt with in OSHA and the EPA
- There is no safe construction date for asbestos to be present in buildings
- Silent killer as the dangerous fibers are too small to be visible and the disease development is over an extensive time frame
- Many blogs. Mine is at www.TheAsbestosBlog.com

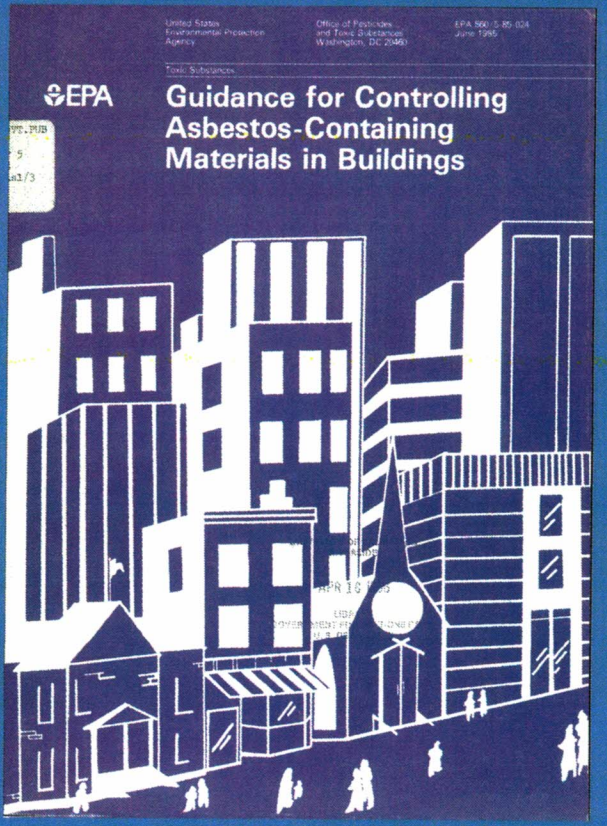
General Responses to Typical Questions

- President Trump, during his last term, attempted to expand allowed uses for asbestos (No idea on his current view, if any)
- Exposure to children, such as in school, is more dangerous than exposure to adults
- People go to jail for violating the rules in many countries
- Many organizational, industry standards, laws, and similar regulations. It can be complicated
- Air Force Cadet Chapel and similar demolition or reconstruction work
- California rules following the fires
- Demolition or war rebuilding risk
- Not all asbestos varieties are created equal. Size and diameter of the fibers affect the functionality
- Technology advances, both identification and medicine

Homes


Where Might Asbestos Be in the Home?
A Exterior Surfaces
1. Deck Undersheeting
2. Cement Asbestos Board Siding and Undersheeting
3. Roof Felt and Shingles
4. Window Putty
B Automobiles
1. Brake Linings, Clutch Facings, and Gaskets
C Insulation
1. Vermiculite Attic Insulation
2. Batt Insulation
3. Vermiculite Wall Insulation
D Flooring
1. Vinyl Asbestos Sheets, Tiles, and Undersheeting
E Boilers, Heaters and Piping
1. Heat Source Covering
2. Air Duct Lining
3. Door and Cover Gaskets
4. Pipe Lagging
5. Wall Gaskets and Lining
F Interior Surfaces
1. Sprayed-on Acoustical Ceilings
2. Acoustical Tiles
3. Textured Paint
4. Heat Reflectors (Woodstoves)
G Electrical Equipment
1. Lamp Sockets
2. Outlet and Switchboxes
3. Insulation on Knob and Tube Wiring
4. Recessed Lighting
5. Main Panel and Fuse Boxes
H Built-in Equipment
1. Water Heaters
2. Range Hoods
3. Clothes Dryers
4. Dishwashers
I Appliances
1. Refrigerators, Freezers, Portable Dishwashers, Toasters, Slow-cookers, Ovens, Hair Dryers (not shown) and Portable Heaters (not shown)
J Miscellaneous
1. Fireplace Logs
2. Asbestos Hot Pads
3. Asbestos Gloves

Asbestos in Buildings, 1985



Appendix A. Asbestos-Containing Materials Found in Buildings*

Subdivision	Generic name	Asbestos (%)	Dates of use	Binder/sizing
Surfacing material	sprayed- or troweled-on	1-95	1935-1970	sodium silicate, portland cement, organic binders.
Preformed thermal insulating products	batts, blocks, and pipe covering			
	85% magnesia	15	1926-1949	magnesium carbonate
	calcium silicate	6-8	1949-1971	calcium silicate
Textiles	cloth[a]			
	blankets (fire)[a]	100	1910-present	none
	felts:	90-95	1920-present	cotton/wool
	blue stripe	80	1920-present	cotton
	red stripe	90	1920-present	cotton
	green stripe	95	1920-present	cotton
	sheets	50-95	1920-present	cotton/wool
	cord/rope/yarn[a]	80-100	1920-present	cotton/wool
	tubing	80-85	1920 present	cotton/wool
	tape/strip	90	1920-present	cotton/wool
	curtains[a]			
	(theatre, welding)	60-65	1945-present	cotton
Cementitious concrete-like products	extrusion panels	8	1965-1977	portland cement
	corrugated	20-45	1930-present	portland cement
	flat	40-50	1930-present	portland cement
	flexible	30-50	1930-present	portland cement
	flexible perforated	30-50	1930-present	portland cement
	laminated	35-50	1930-present	portland cement
	(outer surface)			
	roof tiles	20-30	1930-present	portland cement
	clapboard and shingles:			
	clapboard	12-15	1944-1945	portland cement
	siding shingles	12-14	unknown-present	portland cement
	roofing shingles	20-32	unknown-present	portland cement
	pipe	20-15	1935-present	portland cement
Paper products	corrugated:			
	high temperature	90	1935-present	sodium silicate
	moderate temperature	35-70	1910-present	starch
	understed	98	1935-present	cotton and organic binder
	millboard	80-85	1925-present	starch, lime, clay
Roofing felts	smooth surface	10-15	1910-present	asphalt
	mineral surface	10-15	1910-present	asphalt
	shingles	1	1971-1974	asphalt
	pipeline	10	1920-present	asphalt

* The information in this Appendix is taken, with modification, from: Lory EE, Coin DC. February 1981. *Management Procedure for Assessment of Friable Asbestos Insulating Material*. Port Hueneme, CA: Civil Engineering Laboratory Naval Construction Battalion Center. The U.S. Navy prohibits the use of asbestos-containing materials when acceptable nonasbestos substitutes have been identified.

[a]Laboratory aprons, gloves, cord, rope, fire blankets, and curtains may be common in schools.

Appendix A. (continued)

Subdivision	Generic name	Asbestos (%)	Dates of use	Binder/sizing
Asbestos-containing compounds	caulking putties	30	1930-present	linseed oil
	adhesive (cold applied)	5-25	1945-present	asphalt
	joint compound		1945-1975	asphalt
	roofing asphalt	5	unknown-present	asphalt
	mastics	5-25	1920-present	asphalt
	asphalt tile cement	13-25	1959-present	asphalt
	roof putty	10-25	unknown-present	asphalt
	plaster/stucco	2-10	unknown-present	portland cement
	spackles	3-5	1930-1975	starch, casein, synthetic resins
	sealants fire/water	50-55	1935-present	caster oil or polysobutylene
	cement, insulation	20-100	1900-1972	clay
	cement, finishing	55	1920-1973	clay
	cement, magnesia	15	1926-1950	magnesium carbonate
Asbestos ebony products		50	1930-present	portland cement
Flooring tile and Sheet Goods	vinyl/asbestos tile	21	1950-present	polyvinylchloride
	asphalt/asbestos tile	26-33	1920-present	asphalt
	sheet goods/resilient	30	1950-present	dry oils
Wallcovering	vinyl wallpaper	6-8	unknown-present	--
Paints and coatings	roof coating	4-7	1900-present	asphalt
	air tight	15	1940-present	asphalt

Informational and Government Sources

https://cdphe.colorado.gov/indoor-air-quality/asbestos-general-information
Colorado Department of Public Health and Environment (CDPHE)

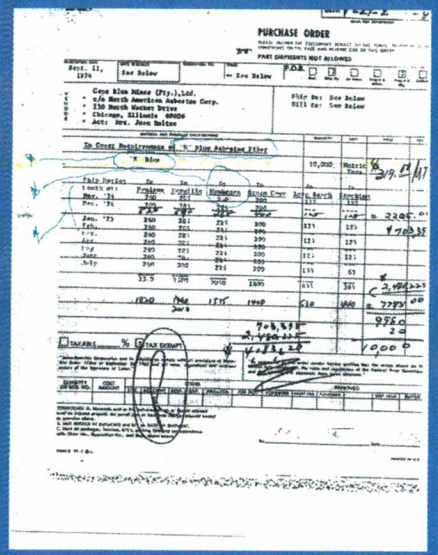
https://www.osha.gov/asbestos

https://www.epa.gov/asbestos

(303) 692-3100 or email at asbestos@state.co.us.

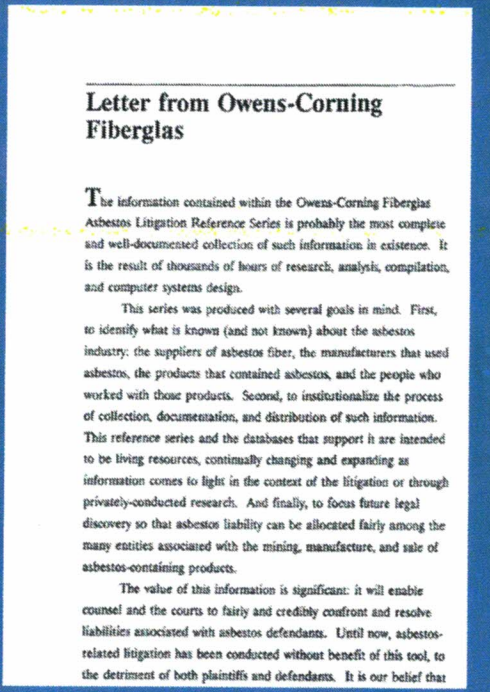
LinkedIn (Asbestos Professionals Network)

"Deadly Dust: Asbestos in the Backyard" on YouTube



PURCHASE ORDER

PART SHIPMENTS NOT ALLOWED



Letter from Owens-Corning Fiberglas

The information contained within the Owens-Corning Fiberglas Asbestos Litigation Reference Series is probably the most complete and well-documented collection of such information in existence. It is the result of thousands of hours of research, analysis, compilation, and computer systems design.

This series was produced with several goals in mind. First, to identify what is known (and not known) about the asbestos industry: the suppliers of asbestos fiber, the manufacturers that used asbestos, the products that contained asbestos, and the people who worked with those products. Second, to institutionalize the process of collection, documentation, and distribution of such information. This reference series and the databases that support it are intended to be living resources, continually changing and expanding as information comes to light in the context of the litigation or through privately-conducted research. And finally, to focus future legal discovery so that asbestos liability can be allocated fairly among the many entities associated with the mining, manufacture, and sale of asbestos-containing products.

The value of this information is significant: it will enable counsel and the courts to fairly and credibly confront and resolve liabilities associated with asbestos defendants. Until now, asbestos-related litigation has been conducted without benefit of this tool, to the detriment of both plaintiffs and defendants. It is our belief that

Pre-Industrial Revolution use of Asbestos

- Many different names including asbestus, asbestinon, and amiantus
- Good resource is *The History of Silk, Cotton, Linen, Wool, and Other Fibrous Substances published in 1845, starting on page 392*
- Stone Age – Used in Africa to strengthen pottery
- 2000 to 3000 BC – Egyptians used asbestos burial shrouds to keep the ashes together during cremation
- 3000 BC – Finland using asbestos rock to pack crevices in log huts and strengthen earthenware pots and utensils
- 400 BC – Greek Sculptor Callimachus made a statue of gold of Athene using a wick of "Magic Flax" which kept burning night and day. The asbestos wick was everlasting. The Vestal Virgins did the same in Rome
- 300 BC – Theophrastus in *On Stones* referred to a substance resembling rotten wood and burned with no harm. He was a student of Aristotle
- Pre-80 AD -- Pliny de Elder in Natural History wrote of a non-combustible linen that also had sound-dampening abilities. No text supported that smelled bad or causes slave health problems. He discusses India and Arcadia, including the use of asbestos in funerals, as confirmed by later discoveries.
- First Century – Dioscorides' *De Materia Medica*, described reusable handkerchiefs made of asbestos that could be cleaned and whitened with fire

Pre-Industrial Revolution use of Asbestos

- First Century – Geographer Strabo identifies asbestos quarry on the island of Evvoia or at Carystus. Fibrous stone combed and spun like wool to make flame-resistant cloth such as napkins and handkerchiefs
- 800 -- Charlemagne (King of the Franks and Holy Roman Emperor) used asbestos to entertain his guests with asbestos tablecloths, cleaned in a fire after banquet
- 1095 -- Used with trebuchet to hurl flaming bags of tar wrapped in asbestos when putting a city under siege
- 1250 -- Marco Polo documented fire-resistant property and visited an asbestos mine to understand the mineral's origin
- 15th Century – used in body armor
- 1566 – Majolus sees asbestos cloth in Venice
- 1660 -- Asbestos Stone Juice medicine sold by apothecaries in Spain (not astringent to the taste)
- 1660 to 1700 – Royal Society of England published a series of eight reviews/letters detailing the then history of asbestos
- 1700s – Norway manufactures asbestos wicks and paper
- 1750 -- Manufacturing plant in the Ural Mountains in Russia after asbestos discovered in 1720, manufactured textiles, socks, gloves, and handbags
- 1830 -- in the U.K., proposed dress for firemen
- 1840 – "Asbestos Young Ladies" reference in a novel discussing their playing fast and loose with their reputations

Six Types of Asbestos and 400 Potential Types of Asbestiform

- Asbestos is a commercial term (not a minerology designation) given to 6 types of rock fibers

Six asbestos as group:

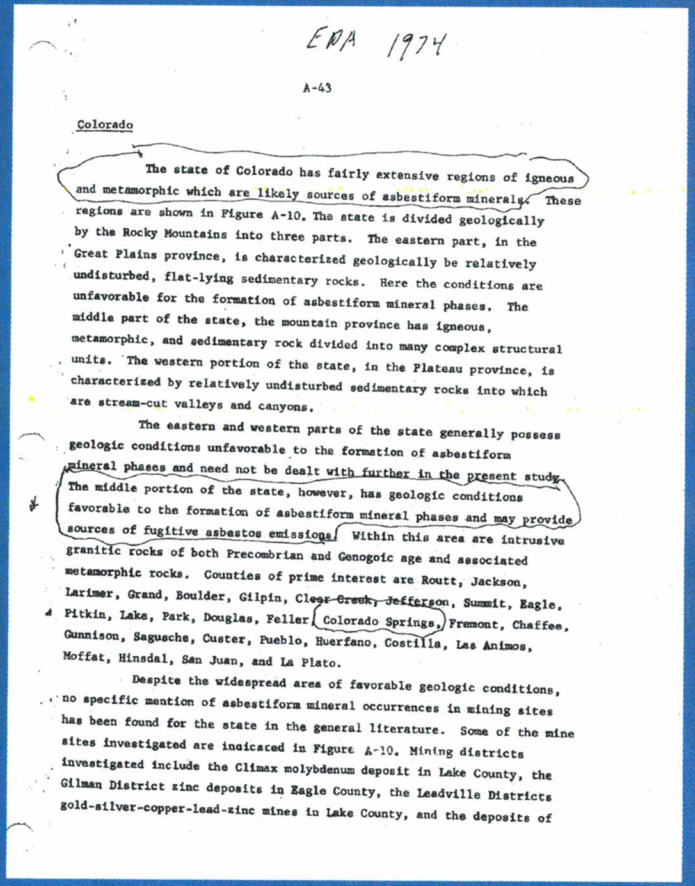
- Five Amphiboles: five fibrous amphiboles corresponding to the asbestiform varieties of: (1) riebeckite (crocidolite), (2) anthophyllite (anthophyllite asbestos), (3) grunerite (amosite), (4) actinolite(actinolite asbestos), and (5) tremolite (tremolite asbestos)

- One Serpentine: chrysotile

- Be Aware that there are also about 400 minerals which are defined as "asbestiform" but not "asbestos." Those are outside the scope of this presentation

Naturally Occurring Asbestos Including in Colorado Springs

Any climate change that exposes rocks, elevates the fibers, or floats the fibers longer is a threat



EPA 1974

A-43

Colorado

The state of Colorado has fairly extensive regions of igneous and metamorphic which are likely sources of asbestiform minerals. These regions are shown in Figure A-10. The state is divided geologically by the Rocky Mountains into three parts. The eastern part, in the Great Plains province, is characterized geologically be relatively undisturbed, flat-lying sedimentary rocks. Here the conditions are unfavorable for the formation of asbestiform mineral phases. The middle part of the state, the mountain province has igneous, metamorphic, and sedimentary rock divided into many complex structural units. The western portion of the state, in the Plateau province, is characterized by relatively undisturbed sedimentary rocks into which are stream-cut valleys and canyons.

The eastern and western parts of the state generally possess geologic conditions unfavorable to the formation of asbestiform mineral phases and need not be dealt with further in the present study. The middle portion of the state, however, has geologic conditions favorable to the formation of asbestiform mineral phases and may provide sources of fugitive asbestos emissions. Within this area are intrusive granitic rocks of both Precombrian and Genogoic age and associated metamorphic rocks. Counties of prime interest are Routt, Jackson, Larimer, Grand, Boulder, Gilpin, Clear Creek, Jefferson, Summit, Eagle, Pitkin, Lake, Park, Douglas, Feller, Colorado Springs, Fremont, Chaffee, Gunnison, Saguache, Custer, Pueblo, Huerfano, Costilla, Las Animos, Moffat, Hinsdal, San Juan, and La Plato.

Despite the widespread area of favorable geologic conditions, no specific mention of asbestiform mineral occurrences in mining sites has been found for the state in the general literature. Some of the mine sites investigated are inaicaed in Figure A-10. Mining districts investigated include the Climax molybdenum deposit in Lake County, the Gilman District zinc deposits in Eagle County, the Leadville Districts gold-silver-copper-lead-zinc mines in Lake County, and the deposits of

History of Asbestos Mining, Locations, and Processing

- Crocidolite (blue asbestos) was discovered in 1803-1806 in South Africa, commercially viable crocidolite comes only from South Africa and Australia
- Commercially viable amosite (brown asbestos) only from South Africa
- Commercially viable chrysotile (white asbestos) is found in many places, including at one time being mined in the United States. However, most chrysotile was imported from Canada. Chrysotile was 95% of the world production of asbestos
- Crocidolite, amosite, and chrysotile were stockpiled as strategic minerals in WWII
- Crocidolite is considered the most dangerous, followed by Amosite, and then chrysotile
- Asbestos first became commercialized in about 1830 to 1860;
- Eventually asbestos was used in approximately 3000 commercial and war related applications/products
- United States Superfund Sites, designated because of asbestos: 13 locations involving mining (such as Libby) or asbestos waste from manufacturing

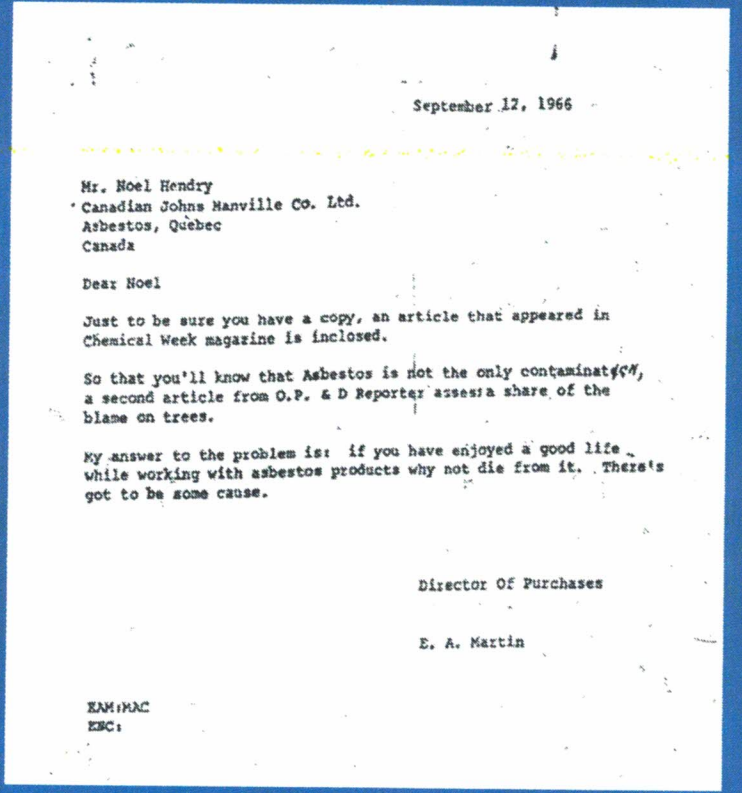
Transformation from Magic Mineral to Social Pariah

- First lawsuits filed in late 1920s. Johns-Manville settled for $30,000 plus a confidentiality agreement and the plaintiff attorney agreeing not to file any more such lawsuits
- The international companies were playing "hide the pea" globally for years
- Lawsuits in the United States started in the 1970s, Johns-Manville filed for bankruptcy in 1982. About 100 asbestos related bankruptcies filed to date
- Discovery of diseases potentially arising from asbestos Inhalation or ingestion
  - Mesothelioma – target disease
  - Lung Cancer – synergy with smoking
  - Suppressed immune system
  - Ovarian Cancer
  - Laryngeal Cancer
  - Colorectal
  - Stomach and other gastrointestinal cancers
  - Asbestosis – breathing issues related to inhalation of fibers

Relationship to Talc, Vermiculite(Libby), and Similar Fibers

- Talc – found in the same mineral veins as asbestos
- Libby Vermiculite, tends to be contaminated with tremolite asbestos
- Taconite – found in the taconite range of northern Minnesota
- Erionite – Located in a number of areas including western United States
- Other asbestiform fibers

An Awful Letter in Conclusion



September 12, 1966

Mr. Noel Hendry
Canadian Johns Manville Co. Ltd.
Asbestos, Quebec
Canada

Dear Noel

Just to be sure you have a copy, an article that appeared in Chemical Week magazine is inclosed.

So that you'll know that Asbestos is not the only contaminant, a second article from O.P. & D Reporter assesses a share of the blame on trees.

My answer to the problem is: if you have enjoyed a good life while working with asbestos products why not die from it. There's got to be some cause.

Director Of Purchases

E. A. Martin

EAM:MAC
ENC:

World Health Organization: Crocidolite (blue) Asbestos Fibers

Do NOT let this chemical enter the environment.