

A FIELD GUIDE TO
ASBESTOS



LOUIE PALU



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INVISIBLE ANONYMOUS

By Louie Palu



Harold and Blayne Kinart, brothers, pictured at ages eight and six in 1952.
Sarnia, Ontario, Canada

My parents were immigrant laborers from Italy and so was every other adult in my neighborhood growing up. Every day these men and women arrived home in crowded vans from factories and construction sites, or on foot from the bus stop, carrying their tools and lunch boxes. I keenly remember one neighbor who commuted by bus to a factory every day of her adult life until she retired and passed away not long after. My mother stopped working as a seamstress to raise me and my sister, but every year until I was an adult, my father would leave for work before I woke up and arrive home, hours later, in a cement-stained pickup truck, just like many other parents on my block. I clearly recall all my father's friends: welders, painters, carpenters, plumbers, and assembly-line workers. They lived hard lives and never complained; they were grateful to have a job and make a living.

In 1991, after graduating from art college, I started what would be a 12-year project on hard-rock miners. And so began my real observance of workers *at work*, which I never actually managed as a child. As I developed the project, miners I met were killed in their workplace in a variety of accidents. Some were crushed, suffocated, or buried alive by rock or machinery. Slowly I learned about industrial disease, the invisible killer that I could not photograph. I am struck to this day by a union official's description of cancers and disease resulting from exposure to toxins in the workplace. He handled compensation cases for the workers and noted that most deaths by work-related disease only occur one or two at a time, and often when victims are at home, out of sight and out of mind. He concluded that if they all died at once, in the thousands, people would take notice. As I reported on work-related cancers and injuries, I couldn't forget his words. I noticed that these men suffered alone and died anonymously, and few of us hear about them. We never see just how many similar deaths from industrial illness occur every year.

In 2003, a legal representative for injured workers contacted me about a man dying from an asbestos-related cancer. She encouraged me to do a story on him. His name was Blayne Kinart, and he was a millwright, someone who assembles and disassembles industrial machinery. It was through Blayne and his family that I would learn about asbestos and its fatal cousin, mesothelioma, a cancer that results exclusively from asbestos exposures. Asbestos is a naturally occurring mineral that is nearly indestructible. It is mined from the ground and has been used to make many products throughout the world. Most importantly for industrial purposes, it is fire-resistant, which has made it useful in many architectural applications, most often as insulation in buildings and ships, and in floor and roofing tiles. The building you are working or living in right now may have asbestos in it, as many still do. The fibers are often microscopic, depending on the form of the asbestos or the product it is used in making. In the past, disease and illness from asbestos were mostly restricted to people with jobs in factories or heavy industry. However, I also found that people who worked in offices near asbestos-heavy construction sites could also be exposed to deadly levels of fibers in the air.

Canada was once a leading supplier and promoter of the material; a town in Quebec was even named after asbestos, and hosted an institute that promoted its use until only several years ago. Over the past several decades, when asbestos was still thought of as a “magic mineral,” the cancers started appearing worldwide, and they are now counted in the thousands. Bans began in Europe and Australia, and overall use is partly restricted and mostly avoided in the U.S. due to illness, deaths and ensuing litigation,. But there is a legacy of asbestos-filled buildings worldwide, and many countries still produce and use it. I visited multiple sites in the U.S., including Ambler, Pennsylvania, just outside of Philadelphia, which was once considered the heart of the American asbestos industry. Though the factories are now gone, thousands of tons of asbestos waste remain in local Superfund sites monitored by the U.S. Environmental Protection Agency.

Most asbestos-contaminated production sites are now buried or fenced off, as if a chain link fence can stop microscopic fibers from blowing through it. Asbestos may be lying dormant in your floor tiles, in your children’s school, or on the insulation around your pipes. After photographing Blayne Kinart, I began expanding my investigative reporting to Scotland, England, and India, more ground zeros where asbestos-related deaths were occurring. Speaking of ground zero, one of the largest releases of asbestos in American history occurred when the World Trade Center towers collapsed in September 2001.

This story was hard to visualize due to the nearly invisible nature of the material and the way that victims were made ill and died from the inside-out. I met with technical experts on the disease, including doctors, legal experts, a physicist, workplace safety officials, and many victims and their families. I came to understand that no one is safe from exposure to asbestos. The people I met who died from asbestos-related disease were exposed in workplaces as diverse as offices, schools, and factory floors. In some cases, wives and children died of asbestos-related cancers without ever working with the material in any way. They were exposed to the contaminated workplace clothing brought home by their husbands and fathers.

After 15 years of work on these stories, I recently learned that one of my childhood neighbors in that immigrant-filled hometown had a serious illness. He was an industrial painter and at some point on the job worked with a material containing asbestos. Years later, it sat latent in his chest or abdomen, altering his body until he was susceptible to mesothelioma and the disease finally killed him. This is how asbestos works: you don’t even know that you are breathing it in, and its damaging effects can’t be measured until it’s too late.

For me, the most important part of this book are the personal photos at the end. These images compel us to look beyond the statistics, facts, and numbers, and to never forget the human faces of this tragic story. We aren’t just talking about a faceless disease or an industrial material—we’re talking about human lives.



58-year-old Blayne Kinart, a former millwright who is dying from mesothelioma, a cancer solely associated with asbestos exposure, standing in his living room in Sarnia, Ontario, 2003.



Blayne Kinart is comforted by his wife Sandy after receiving a painkiller in the form of two patches stuck to his upper back.



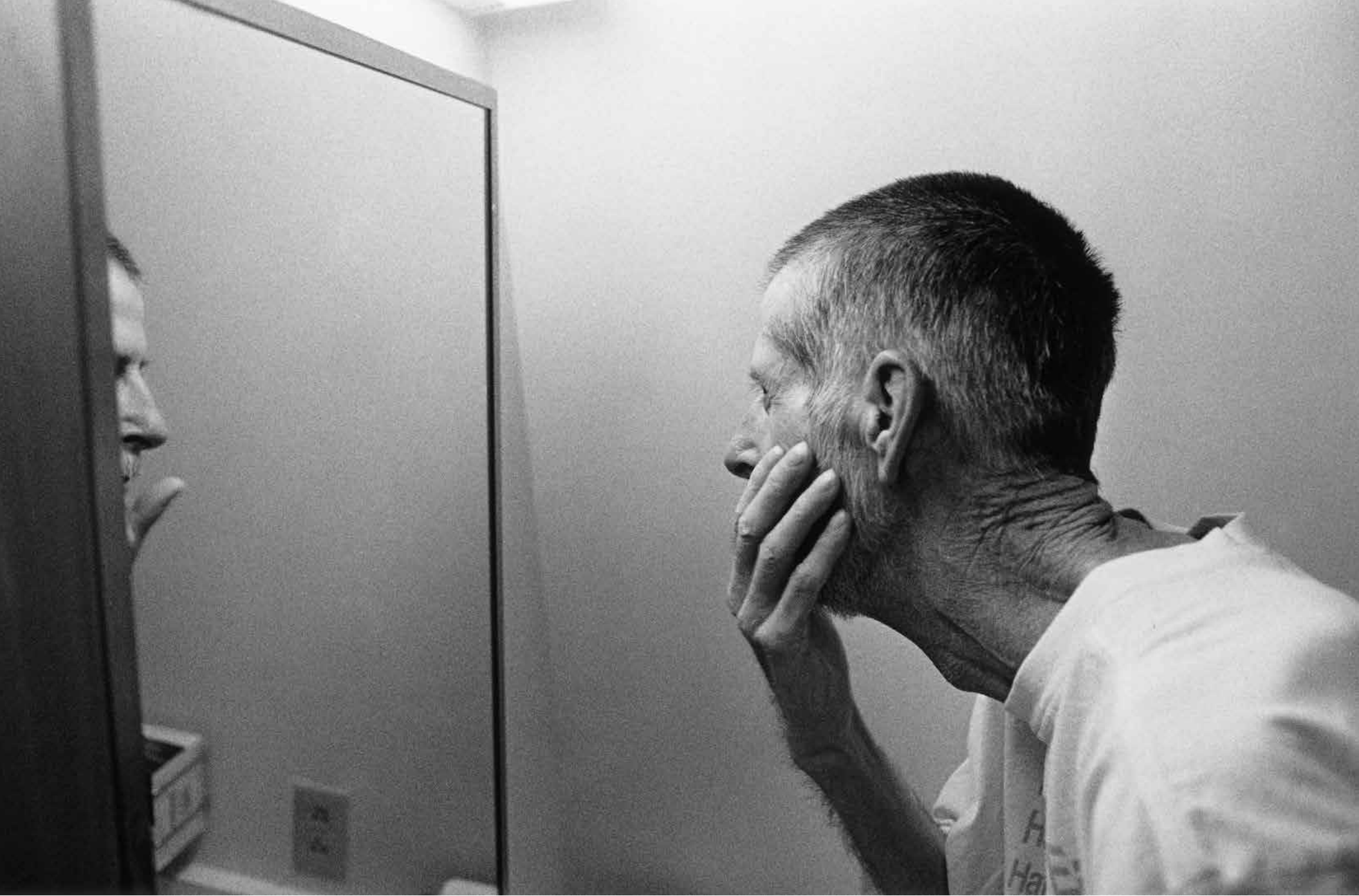
Blayne Kinart kissing his daughter Shari goodbye after a visit to his house.



Blayne Kinart's brother Harold touches a boyhood photo of Blayne on a quilt made of photos from Blayne's life.



In his final days of life, Blayne Kinart lies in his bed breathing with the aid of a respirator.



Blayne Kinart looking at himself in the mirror at the palliative care unit at Bluewater Health.



The Mine Lac d'Amiante a.k.a. the Lake Asbestos mine, LAB mine, Black Lake mine, Black Lake, Mégantic Co., which is an open pit asbestos mine in Thetford Mines, Quebec, Canada. Thetford Mines was founded in 1876 after the discovery of large asbestos deposits in the area. The city became a hub for one of the world's largest asbestos-producing regions.



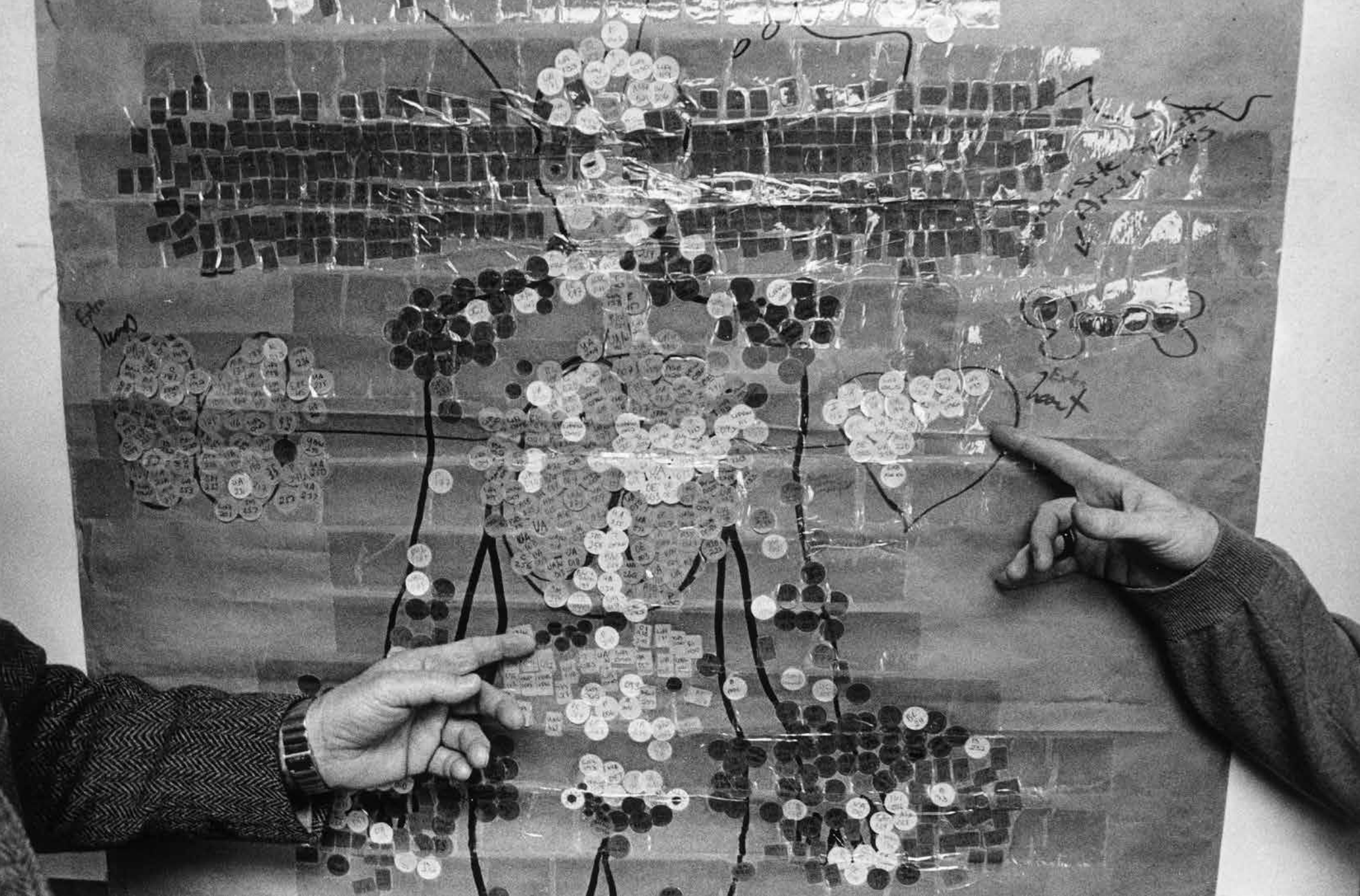
Piles of tailings dominate the landscape in Quebec's asbestos district. This is the view from the town of Black Lake, looking toward Thetford Mines.



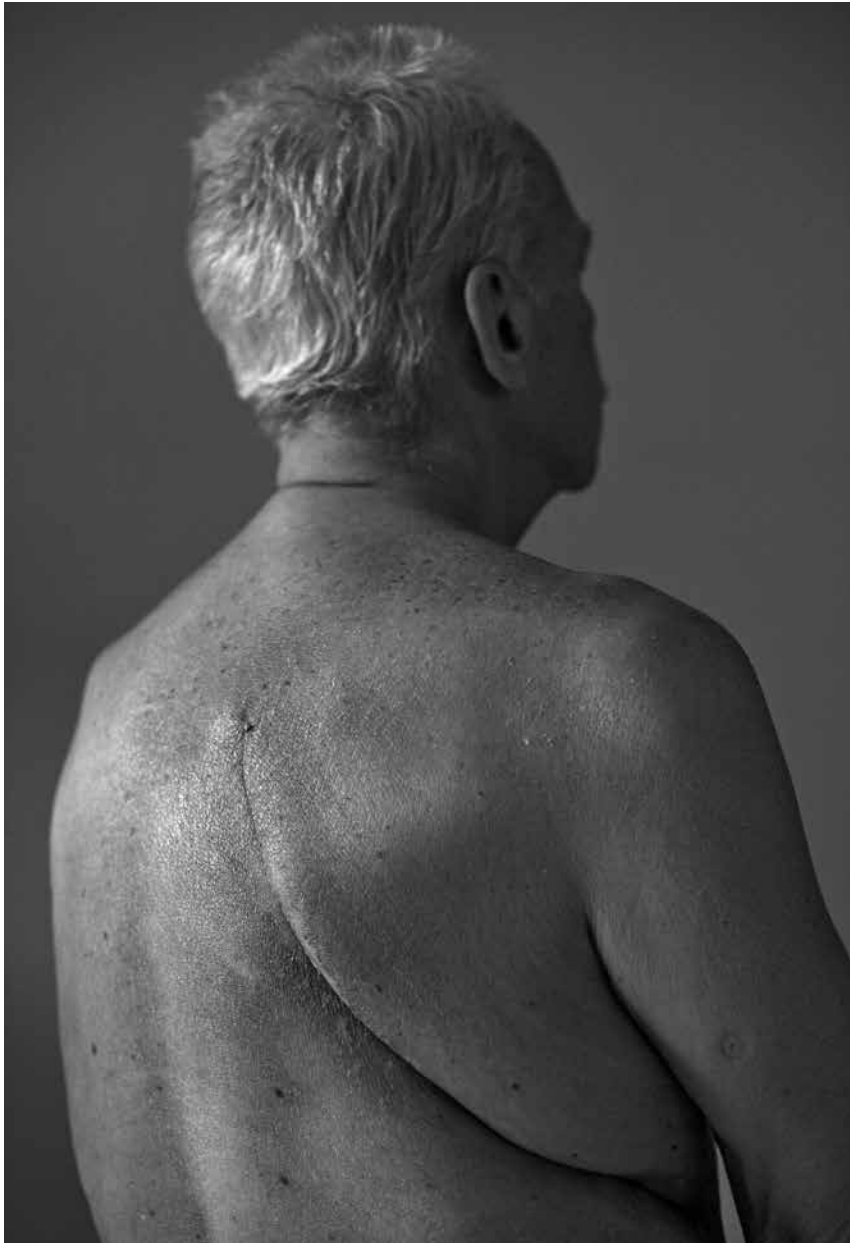
Asbestos tailings from the mining of chrysotile asbestos, a.k.a. white asbestos, seen in the city of Thetford Mines in Quebec, Canada.



The town of Black Lake, Quebec, now a part of Thetford Mines, is surrounded by tailings and residue from the mining of chrysotile asbestos. Up to 300 million tons of this residue has been abandoned by mining operations throughout the region.



A doctor and the director of an occupational health clinic for workers in Sarnia, Ontario, point to a body map, used to pinpoint clusters of health issues. Each dot represents a case of occupational disease or a workplace injury, some of which are caused by exposure to asbestos.



The scar on John Nolan's back from a 2014 lung removal, which followed his diagnosis with mesothelioma. John, seen here at age 67, is from Stevensville, Ontario, and was exposed to asbestos during a renovation near his office in Windsor, Ontario, in the 1980s.

ASBESTOS-RELATED DISEASES

Taken from the Center for Disease Control's "Health Effects of Asbestos," 2016, available online: https://www.atsdr.cdc.gov/asbestos/health_effects_asbestos.html

Breathing asbestos can cause tiny asbestos fibers to get stuck in the lungs and irritate lung tissues. Scientific studies have shown that the following non-cancer diseases can be caused by breathing asbestos:

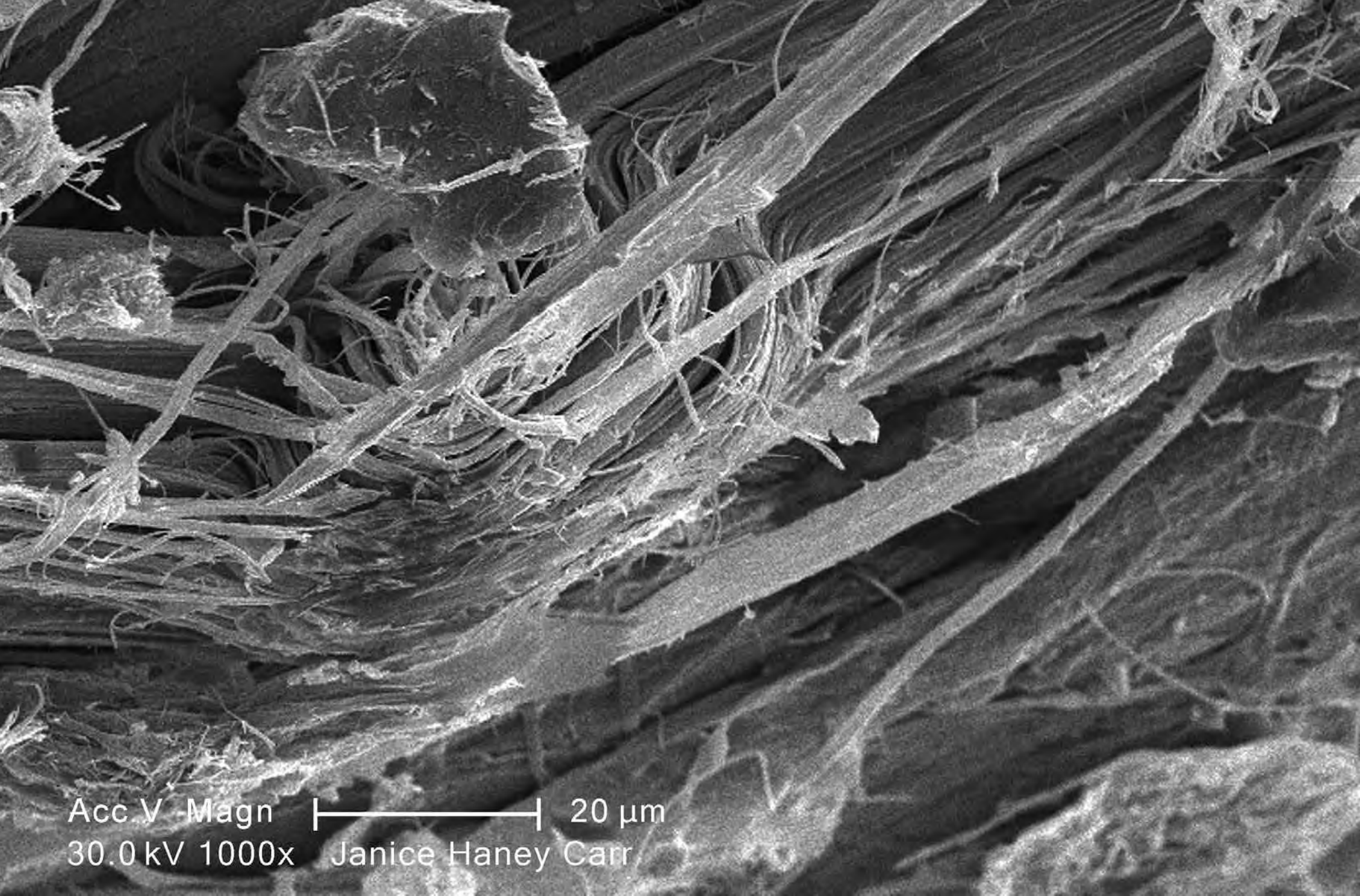
- Asbestosis is scarring in the lungs caused by breathing asbestos fibers. Oxygen and carbon dioxide do not pass in and out of scarred lungs easily, so breathing becomes harder. Asbestosis usually occurs in people who have had very high exposures over a long time, but years may pass before any symptoms appear.
- Pleural disease is a non-cancerous lung condition that causes changes in the membrane surrounding the lungs and chest cavity (pleura). The membrane may become thicker throughout (diffuse pleural thickening) or in isolated areas (pleural plaques), or fluid may build up around the lungs (known as a pleural effusion). Not everyone with pleural changes will have problems breathing, but some may have less efficient lung function.

Asbestos exposure also increases the risk of developing certain cancers:

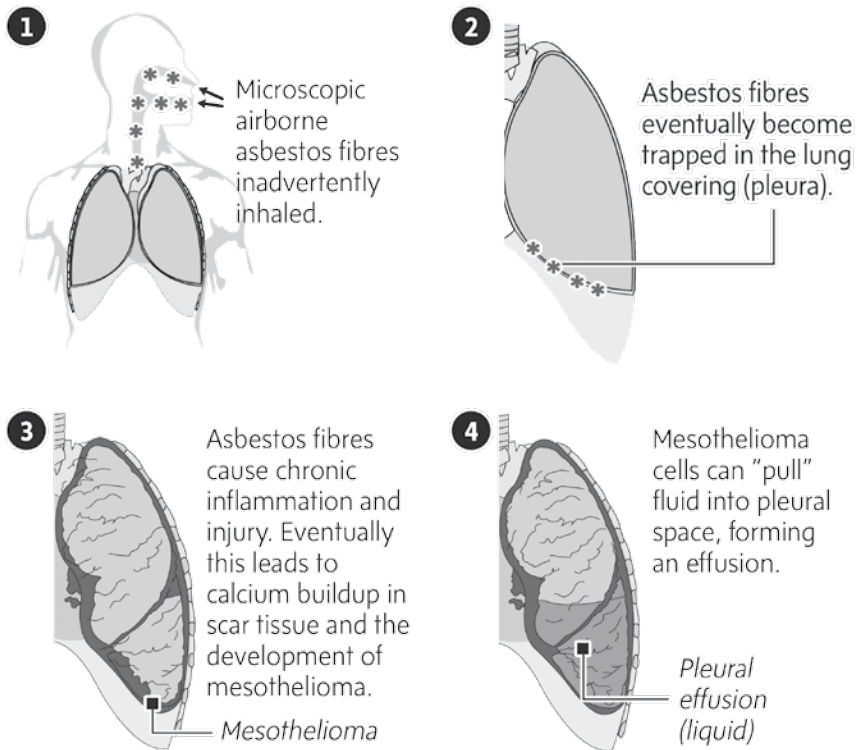
- Lung cancer is a malignant tumor that invades and blocks the lung's air passages. Smoking tobacco combined with asbestos exposure greatly increases the chance of developing lung cancer.
- Mesothelioma is a rare cancer of the membrane that covers the lungs and chest cavity (pleura), the membrane lining the abdominal cavity (peritoneum), or membranes surrounding other internal organs. Signs of mesothelioma may not appear until 30 to 40 years after exposure to asbestos.

In addition to lung cancer and mesothelioma, asbestos exposure can also cause cancer of the larynx and ovary. Current evidence also suggests asbestos exposure may cause cancer of the pharynx, stomach, and colorectum.

After exposure occurs, asbestos can't be removed from the lungs. Preventing further harm to the respiratory system can lower the chances of disease developing or slow down progress of an existing disease.



Electron micrograph of a piece of raw chrysotile, a.k.a. white asbestos, which had been excavated from the Lowell Asbestos Mine on Belvidere Mountain, Vermont, at a magnification of 1000x.
Content Provider: CDC/John Wheeler, Ph.D., D.A.B.T.
Image by Janice Haney Carr, Centers for Disease Control and Prevention.



Victims of mesothelioma experience difficulty breathing, weight loss and acute pain. Once diagnosed, they are typically given between six months and a year to live. Patients can require litres of the fluid to be removed from their lungs. (Sources: Stanford School of Medicine, Mesothelioma-law.org-2013; Dr. John Cho; Graphic Carrie Cockburn and Matthew Bambach/The Globe and Mail)

Lyle Cassidy, age 64, from Stettler, Alberta, at Toronto General Hospital where his lung was removed after his 2013 mesothelioma diagnosis. He was exposed to asbestos when working in construction and then at a power plant in the 1970s. His treatment involved radiation, removing the lining of his lungs and cutting into his heart and diaphragm in an effort to extend life.



The Turner and Newall asbestos plant, now closed, in Rochdale, England. This was once the largest asbestos product manufacturing plant in the world, located only a few miles from Manchester. This plant was owned and operated by the now-defunct company Turner & Newall, which used chrysotile asbestos from the mines in Quebec, Canada.



Helen Winning, age 56, worked at the Templeton Carpet Factory in Glasgow. She did not work in the production area and only went on the shop floor to get administration forms from the production line managers. In 2006, she was diagnosed with mesothelioma caused by asbestos exposure at the factory. Her mother, a weaver at Templeton before Helen was born, died from mesothelioma in 1994.



Former architect Margret Hanna, age 63, seen in her home in Edinburgh, Scotland. She was exposed to asbestos in the late 1960s and early '70s, when she was a junior architect and visited a construction project once a month for one year and once every three months for the next three years—minimal exposure relative to most cases. She has the incurable cancer mesothelioma from asbestos exposure.

A CONVERSATION WITH ROBIN HOWIE

physicist and occupational hygienist

Q: Please introduce yourself.

A: I'm Robin Howie, Grad Inst P, Dip Occ Hyg. I worked in the laboratory with asbestos between about 1974 and 1985 and carried out a number of studies to quantify the real-world performance of respirators and protective clothing during the period of about 1990 to 2010. I have therefore been working directly with asbestos for about 45 years. I have published over 100 papers or articles, the majority of which have addressed the hazards and risk from asbestos.

Q: What is asbestos and why was it and is still so widely used?

A: Asbestos is a family of naturally occurring fibrous silicate minerals. There are a number of different types of asbestos of which, by tonnage, the most commercially important were chrysotile, often called "white asbestos"; amosite, often called "brown asbestos"; and crocidolite, often called "blue asbestos." Crocidolite and amosite are amphibole minerals. Chrysotile is a serpentine mineral. There are other types of amphibole asbestos: actinolite, anthophyllite and fibrous tremolite, of which only anthophyllite has been of commercial importance. Fibrous tremolite is a common natural contaminant of chrysotile from Quebec, the Punjab, and parts of China. Asbestos is a non-flammable material that was used to provide fireproofing for reinforced concrete and steel girder structures. It was also used in heat-insulating materials for boilers, furnaces, heating equipment, early jet engines, and hot and cold pipes, and was mixed with bitumen to form battery boxes for submarines and road vehicles until replaced by plastics in the late 1960s.

Because of its fire-resistance, amosite was widely used in building products such as asbestos insulating boards. The largest single use



Tom O'Donnell, age 48, who has mesothelioma, sits with his sister Judy Russell, 51, at his home in Campbellford, Ontario, Canada. Tom never worked with asbestos, but his father died of lung cancer caused by asbestos after he had worked for nearly 25 years at the now-defunct Johns-Manville plant in Toronto. Two other siblings have succumbed to the same cancer. Medical authorities suspect he and his siblings were victims of asbestos exposure from dust carried unknowingly home on their father's work clothes.

of asbestos was in asbestos cement products. During World War II, both the U.S.A. and U.K. used very large tonnages of crocidolite and amosite in Naval and Merchant Navy vessels. The shipyard workforce in the U.S.A. must therefore have been very large. Almost all of these ships have now been scrapped, so the workers who built them, maintained them, and/or scrapped them would have been at risk of exposure to asbestos.

Although imports of asbestos into the U.K. has been banned since about 1999, it has recently been found that “asbestos-free” Bunsen burner gauzes, presumably imported from China, were heavily contaminated with fibrous tremolite. Fibrous tremolite has the same mesothelioma potency as crocidolite. In Libby, Montana, and in some talcum mines in New York State, the overburden and/or raw minerals were heavily contaminated with fibrous tremolite and have caused many mesothelioma cases.

Q: How small can the asbestos fibers be, and how are they shaped?

A: The median diameters of amosite, crocidolite and chrysotile fibers are about 0.26, 0.09 and 0.06 micrometres (um) respectively. Their median lengths are about 2, 5, 1.2 and 0.6 um respectively. Note that the diameter of a human hair is about 20-40 um. The aerodynamic diameter, and hence the settling velocity, of fibers is essentially defined by the fibers’ diameter, and particles thinner than about 3-5 um are deemed to be respirable, i.e. able to be inhaled. So a large majority of all types of asbestos fibers are able to penetrate deep into the lung during inhalation.

Q: What illnesses does asbestos cause?

A: In order of increasing severity: pleural effusion, pleural plaques, pleural thickening, asbestosis, lung cancer, and mesothelioma. Mesotheliomas have also been observed in the testicular sac. Cervical cancers have been observed in women who used talcum powder. All types of asbestos can cause asbestosis, lung cancer, and mesothelioma.

Q: Is there a safe level of asbestos humans can breathe in?

A: No.

Q: Are there safe alternate materials that can be used in place of asbestos?

A: Yes, glass or rock fibers. But such fibers can be highly irritating to both the skin and breathing tract. Other fibers such as calcium silicate can be used. However, some synthetic fibers present severe health hazards.

Q: Of the three types of asbestos—blue, brown and white—which is safe to use?

A: None are safe to inhale. Chrysotile is the less dangerous, in the sense that a rifle bullet is less dangerous than an A-bomb. But remember how many men died from bullets in World War I, World War II, and Vietnam.



Workers outside an auto parts plant in New Delhi, India, that uses asbestos in the manufacture of car components. These workers wear no safety equipment while working and have no access to any equipment to prevent the inhalation of dust and asbestos.



This area is believed to be the unmarked gravesite of Nellie Kershaw in Rochdale Cemetery, England. Hers is one of the world's first cases of disease related to exposure from asbestos described in medical literature. She was a Rochdale-based Turner & Newall asbestos textile worker who died in 1924 from what was described as "asbestos poisoning". At the time, asbestos-related illness was not a recognized occupational hazard. She died at the age of 33, a mother to two children.



Robert Boal, age 67, and Harry McClusky, age 68, two former shipyard workers with asbestosis, are seen by the River Clyde and shipbuilding yards in Glasgow, Scotland. Shipbuilding was once a major industry here and large quantities of asbestos were used, resulting in numerous cases of asbestos-related disease and death.



Raghunath Manwar examines an X-ray of one of several workers who has been diagnosed with asbestosis in Ahmedabad, India. Raghunath is the secretary of an NGO, the Occupational Health and Safety Association, that assists employees affected by asbestos from a power-generating company and a cement factory.



A man adjusts asbestos cement roof tiles on a house in a poor rural community on the outskirts of Ahmedabad, India. This entire community is built on top of—and from—the asbestos scraps from decades of production at a nearby cement plant. This man broke numerous pieces of roof tile containing asbestos wearing no protection.



A woman comforts her baby outside her home, which is made from broken asbestos roof tiles in a poor rural community on the outskirts of Ahmedabad, India. Almost every single residence in this and many villages and cities like this throughout India have asbestos cement products in them.



New York City first responders and victims family members at Ground Zero on the fourth anniversary of the World Trade Center attacks on September 11, 2001. The North Tower contained several hundred tons of asbestos. The collapse of the towers resulted in one of the largest single uncontrolled releases of asbestos in the history of the U.S.



BoRit Asbestos Superfund Site in Ambler, Pennsylvania. According to the U.S. Environmental Protection Agency, the 32-acre Site consists of three areas that are contaminated with asbestos. From the early 1900s to the late 1960s, the BoRit Asbestos Site was used to dispose of asbestos-containing material from a nearby manufacturing plant.



Bill Coulbeck, pictured at age 38 in 1974 with daughter Stacy (Coulbeck) Cattran.
Ripley, Ontario, Canada
Died from mesothelioma in 2008.
Asbestos exposure resulted from work at a chemical plant and power-generating stations.



Alan Reinstein, pictured age 60 in 2002 with his wife Linda and daughter Emily Reinstein.
Los Angeles, California, USA
Passed away from mesothelioma in 2006.
Asbestos exposure was both occupational and non-occupational.



Mike Mattmuller, pictured at age 26 in 2008 with his wife Jessica and niece Meredith.
Cleveland, Ohio, USA
First diagnosed with mesothelioma in 2011, currently being treated for the disease's third recurrence.
Asbestos exposure believed to be second-hand.



Lawrence W. Davis, pictured in his twenties in 1968.

West Haven, Connecticut, USA

Died from mesothelioma in 2012.

Asbestos exposure possibly resulted from father's clothes after industrial work, at one of several jobs, or during a renovation on his home.



Iva Marie Lewis, pictured at age 71 in 1994 with her husband Norman Walter Lewis.

Roxana, Illinois, USA

Passed away from mesothelioma in 2012.

Asbestos exposure was believed to result from husband's work clothes that he brought home during his career as an asbestos pipe insulator.



Joe Amento, Jr., pictured at age 49 in 2000 with his children Joey and Julie.
Ambler, Pennsylvania, USA

Died from mesothelioma in 2003.

Asbestos exposure was environmental, resulting from a childhood in Ambler, less than a mile from several asbestos manufacturing plants and waste sites. Father also worked in an asbestos pipe plant and brought the dust home on his clothing.



David Dioguardi, pictured at age 56 in 1997 with his wife Eileen.
Chicago, Illinois, USA

Passed away from mesothelioma in 2016.

Exposed to asbestos while working as a carpenter and tearing out octopus furnaces.

ACKNOWLEDGMENTS



Blayne and Harold Kinart, brothers, pictured at ages 48 and 50 in 1994.

Sarnia, Ontario, Canada

Both died from mesothelioma: Blayne in 2004, Harold in 2018.

Both brothers' asbestos exposure occurred at industrial plants. Blayne worked as a millwright, and Harold worked as a plumber and pipefitter.

I dedicate this book to my parents, Fiorina and Giuseppe Palu.

I am grateful to all the people who have been affected by asbestos and allowed me into their lives, including family members, hospital staff and union officials. Personal photos appear with permission, courtesy of Marilyn Amento, Joseph Amento III, Julie V. Amento, Stacy Cattran, Jackie Coulbeck, Eileen A. Dioguardi, Courtney Davis Hissong/United States Army, Sandy Kinart, Conor B. Lewis, Charlotte J. Malone, Jessica and Mathew Mattmuller, Jonathan and Meredith Mattmuller, Emily Reinstein, Linda Reinstein and Domani Tripam. Special thanks to everyone who helped with these photographs, especially Linda Reinstein of the Asbestos Disease Awareness Organization.

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As of the publication of this book, I was able to confirm that Robert Boal, Lyle Cassidy, Margret Hanna, Harry McClusky, John Nolan, and Helen Winning have also all passed away.



Demonstration of a Mansfield asbestos firefighting suit at R.C.A.F. Station
Ottawa, 1939 Rockcliffe, Ont.
(Library and Archives Canada)

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