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## Asbestos: The real danger is irrationality

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*The campaign to ban asbestos is based on anti-scientific hysteria. Research shows that small airborne amounts of this highly beneficial mineral are not dangerous at all. Elisabeth Pascali reports.*

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Over the last 20 years, most people have been led to believe that any level of exposure to asbestos is unsafe. Everyone has been affected, to a greater or lesser extent, as schools have been closed for long periods of time and homes have had to be renovated—all because of asbestos. By current estimates, nearly \$100 billion has been spent by schools alone in their asbestos abatement program. However, as this article will show, *small amounts of asbestos in the air are not dangerous.*

The Occupational Safety and Health Administration (OSHA) has set an occupational safety standard which establishes that workers can work safely under conditions where there are fewer than 0.1 airborne asbestos fibers per cubic centimeter of air. Of course, like fire, asbestos should be used wisely. If you choose to lay asbestos insulation in your attic, or work with it in high concentrations, a mask and appropriate precautions are required.

However, *there is no danger to the public* from airborne asbestos caused by the disintegration of insulation and fireproofing in buildings. And asbestos is still the best fireproofing material that we have available today.

Measurements in more than 214 schools show the average fiber content in schoolrooms to be 0.0025 fibers per cubic centimeter of air—400 times lower than the OSHA requirement for worker safety. The real damage has been done by the Environmental Protection Agency (EPA), and other irresponsible promoters of the myth that “one fiber of asbestos can kill.” They have been promoting a blind fear of this very useful mineral—a fear that attacks our powers of scientific judgment (just as *heavy doses* of airborne asbestos might attack our lungs).

The damage to rationality can be seen in many newspaper reports. This article in the Aug. 13, 1993 *Washington Post* is typical: “Nineteen families were forced to flee their apart-

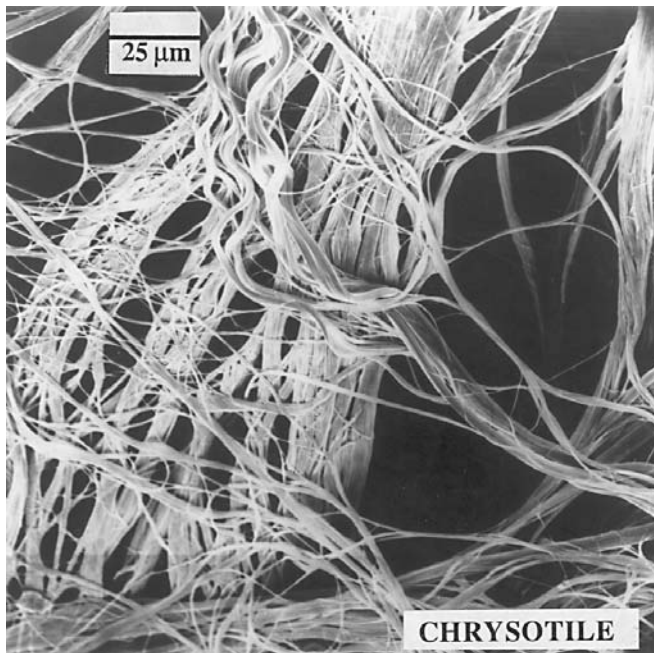
ments when asbestos contamination was found on the sixth floor of a HUD-owned Tyler House Apartments on Aug. 6. Some rushed out with only the clothes on their backs. ‘We’re terrified, and we don’t know what is going on,’ said third floor resident Yvonne Commings at the meeting this week with officials from the U.S. Department of Housing and Urban Development [HUD]. ‘I’m so scared I can’t eat or sleep.’ ”

This incident occurred two years after the U.S. Fifth Circuit Court of Appeals threw out the EPA’s attempt to ban all asbestos products, and the EPA itself admitted that asbestos insulation that was already in place did *not* cause a health threat (see below).

### The miracle mineral

Did you ever wonder how the Wicked Witch of the West’s broom in the movie “The Wizard of Oz” could burn and threaten the Scarecrow, and yet still look perfectly normal later in the film? This was not just the movie industry’s sleight-of-hand; the “straw” in the broom was actually made of asbestos. Actors and theatergoers at the time were very familiar with materials made from asbestos, as stage curtains had been made from asbestos proscenium for more than 100 years, and had been credited with saving many lives in theater fires. In 1939, the year that “The Wizard of Oz” was made, asbestos was hailed for its “service to humanity” at the New York World’s Fair, where a giant Asbestos Man greeted visitors to the pavilion of a company called Johns-Manville. The fairgrounds themselves were full of asbetos, from its rooftop coverings, to help with fireproofing, to the underground cement pipes that were strengthened with asbestos.

Once known as “mineral silk,” asbestos has had many useful roles in mankind’s history. The Greek physician Dioscorides in his first century A.D. text *De Materia Medica*,



Highly magnified views of two types of minerals classified as asbestos: The photo on the left shows the mineral chrysotile (“white” asbestos), which is typical of the type mined in the United States and Canada. This type is used in 95% of asbestos products in the United States. The photo on the right shows the mineral crocidolite (“blue” asbestos) from North Cape, South Africa. Note the soft, “spaghetti”-like appearance of the white asbestos fibers as contrasted to the harder splintered fibers in blue asbestos. Studies have shown that significant exposure to blue asbestos can cause mesothelioma (cancer of the chest cavity lining), whereas exposure to white asbestos does not.

reported that reusable handkerchiefs could be made of asbestos, which could be cleansed and whitened with fire. It was also used at the time as a wick for oil lamps (in fact *asbestinon*, the original name given to this mineral by Pliny the Elder, means “unquenchable”). This was the secret of the Vestal Virgins’ eternal flame at the shrine of Vesta. Later, in the ninth century, Emperor Charlemagne had a tablecloth made of asbestos that he threw into the fire and pulled out unharmed to impress his dinner guests. In the 1820s, an Italian businessman named Giovanni Aldini created a line of ready-to-wear fireproof apparel, designed specifically for urban firemen. With the advent of the first industrial revolution, asbestos’s fireproof properties became a crucial element in the development of the steam engine. Mixed with rubber, it proved an ideal material for internal components like gaskets and packings.

During World War II, asbestos was considered a strategic asset and was banned from being used for any non-essential purposes. Several hundred tons had to be supplied to the U.S. government daily during the war, for use in everything from parts for ships’ engines and jeeps, to bazooka shells and parachute flares. On the battlefield, it was even used to make easily sterilized bandages.

After the war, high-rise buildings became a reality, in part because of the development of a technique which sprayed an asbestos coating onto the steel structure, which protected it from buckling in the heat of a fire. It was used a great deal in

housing construction: fire-retardant shingles, asbestos-strengthened cement, and fireproof insulation. Even telephones and other consumer goods were made of plastic mixed with asbestos.<sup>1</sup>

### The real medical danger

As the use of asbestos in manufacturing and construction industries grew, health problems among workers exposed to high levels of asbestos dust began to appear. Prior to World War II, British medical professionals began to see cases of asbestosis—the hardening of the lung tissue due to exposure to asbestos dust—which could become fatal, by eventually making the lung completely inoperable. They were also seeing what would later be recognized as cancer of the lung and a very rare cancer called mesothelioma, cancer of the lining of the chest cavity. A little later, in the United States, Dr. Irving Selikoff of Mt. Sinai Hospital in New York published a definitive study of the effects of dusty working conditions for asbestos insulation workers.

Dr. Selikoff had been working as a consulting physician to the New Jersey Asbestos Workers Union, and saw conditions of the workers which were quite horrifying to him. His paper, published in 1964, proved that working under the very dusty conditions of the asbestos insulation factories was very

1. See James E. Alleman and Brooke T. Mossman, “Asbestos Revisited,” *Scientific American*, July 1997, pp. 70-75.

dangerous to workers' health. His research led to needed modifications in the work environment for the asbestos industry. However, later in the 1970s, when studies came out showing that the effects of asbestos fibers varied depending on the type of asbestos used, Dr. Selikoff and the people who were working with him called this "revisionism." "All you have to do is see one or two mesothelioma patients to know it doesn't take much asbestos to produce it," said Selikoff. "I'm only interested that human beings not be further exposed to asbestos. And those who say they should be further exposed really have to explain why."<sup>2</sup>

Many studies of the health effects of asbestos on miners and industrial workers have been done. Since the late 1970s, Dr. Malcolm Ross (see accompanying interview), a minerologist from the U.S. Geological Survey and a world authority on asbestos, has been helping the medical profession to understand the different properties of the various minerals categorized as asbestos. There are six main varieties of asbestos, only three of which have been commercially used. They are classified together, because they all contain long chains of silicon and oxygen, which give them their fibrous characteristics.

Of the three commercially used, two: crocidolite, or "blue asbestos," and amosite, or "brown asbestos," are of the amphibole variety. The third type is chrysotile, or "white asbestos"; its fibers are much curlier and are thus known as the serpentine variety.

Dr. Ross published numerous papers, including an extensive survey published in 1984,<sup>3</sup> of the studies done on the adverse health effects of asbestos to asbestos mining and industry workers, in order to help to predict the health risks of non-occupational exposure. The studies showed that 1) mesothelioma is principally caused by blue asbestos and to a lesser extent brown asbestos, but not by chrysotile or white asbestos; 2) asbestosis and lung cancer can be caused by all three types of commercially used asbestos, although the risk of lung cancer is greatly increased in those who smoke; and 3) the risk posed by working with asbestos is clearly dependent on the amount of asbestos fibers that are airborne.

OSHA has determined that 0.1 fibers/cubic centimeter is the highest density of airborne asbestos that can be allowed in a safe workplace. A few of the studies done of workers show that this is a very safe limit. Chrysotile asbestos miners of Quebec, who worked for more than 20 years under conditions where there was an average of 20 fibers/cubic centimeter in the air that they breathed, were found to live perfectly normal lives, with no increase in mortality. A study done in Cardiff,

Wales, of asbestos cement workers, showed no increased incidence of lung cancer or other asbestos-related diseases, even though the 1,970 workers surveyed had been exposed to average levels of 1-2 fibers/cubic centimeter of mostly chrysotile or white asbestos per milliliter of air for a period of six months or longer between the years of 1936 and 1977.

The level of 1-2 fibers per cubic centimeter is much lower than the level that workers experienced either in asbestos textile manufacturing, or installing or removing asbestos insulation in heating and electrical conduits, or in any workplaces without ventilation. Studies of the workers under such conditions showed a marked increase in death due to cancer and asbestosis (although mesothelioma was still restricted to those exposed to the amphibole type of asbestos and not chrysotile).

If this had been the end of the story, it would have been a very successful case of industrial hygiene at work. It is very clearly established that those who work with asbestos and install it in buildings must take great precautions.

### The political witch-hunt

Unfortunately, the EPA and private environmental organizations extrapolated the work that Dr. Selikoff and others had done, transforming the message into one of great public danger to *anyone* exposed to *any* amount of asbestos. Their motto, used to scare parents, homeowners, and schoolchildren alike, was "one fiber can kill." Although 90-95% of the asbes-

## Asbestos is not guilty!

*Co-author Dr. Paul Lysenko is a research chemist, originally from Ukraine. He graduated from the University of Kharkov in 1932, and soon after developed a very efficient technique for the conversion of low-quality coals into standard quality coking coals. Lysenko's technique met with political opposition from supporters of existing technologies, but it was so successful that it was implemented throughout the Donbass region in the late 1930s. Scientific journals in Germany and the United States published translations and abstracts of many of Lysenko's papers.*

*Although his brother, Trofim D. Lysenko, was an Academician whose name became synonymous with Stalinist science, Paul Lysenko was driven into exile in 1942, by the same Soviet political regimentation of scientific research that had glorified his brother. Paul and his wife Natalie moved to the United States in 1949, under the sponsorship of the International Rescue Committee.*

*This article is composed of excerpts from five different appeals concerning asbestos that Drs. Paul and Natalie Lysenko presented to the U.S. Congress, the President, and the EPA during second half of the 1980s.*

2. Richard Stone, "News and Comment: No Meeting of the Minds on Asbestos," *Science*, Vol. 254, November 1991, p. 929.

3. M. Ross, "A Survey of Asbestos-Related Disease in Trades and Mining Occupations and in Factory and Mining Communities as a Means of Predicting Health Risks of Nonoccupational Exposure to Fibrous Minerals," *Definitions for Asbestos and Other Health Related Silicates*, ASTM STP 834, Benjamin Levadie, ed. (Philadelphia: American Society for Testing and Materials, 1984), pp. 51-104.

tos used in the United States is of the safer chrysotile type, the EPA ran a campaign which, at its height, tried to have all asbestos removed from buildings, and its use completely banned by 1996.

Fortunately, the Asbestos Information Association succeeded in overturning the ban on all asbestos products in 1991, by taking the EPA to court.

It cannot be an accident that this issue was picked up by the EPA in the 1970s. Think back to the change in attitude of public institutions between 1969 (the height of the Apollo Moon landing program) and 1979 (the EPA's first banning of asbestos). Environmentalism and "small is beautiful" philosophies began to dominate. In 1972, the Club of Rome published a Malthusian-premised computer projection called *Limits to Growth*, purporting to prove that the biggest danger that mankind faces in the coming decades is its own belief in growth and progress.<sup>4</sup>

Asbestos was the second major substance to be banned by the first EPA Administrator, William Ruckelshaus. The first chemical to be banned had been the pesticide DDT, which had all but eradicated malaria in many developing countries, and which Ruckelshaus admitted that he banned, not for sci-

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4. Dennis Meadows, Donella Meadows, Jorgen Randers, and William W. Behrens, *The Limits To Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Signet Classics, 1972).

entific reasons, but for political ones.<sup>5</sup> Alongside this was the witch-hunt against nuclear energy, a technology that promised to bring abundant, cheap, clean, and safe energy to many nations of the world, with the Atoms for Peace program.

But for anyone who went to school in the 1970s or later, asbestos was known as a "poison" and nothing else. According to the Asbestos Information Association, the use of asbestos dropped from nearly 800,000 tons/year in the mid 1970s to about 41,000 tons in 1990. The real damage that has been done by creating such an atmosphere of terror, is to abort the excitement in new technologies and discoveries of an entire generation.

That is not to say that asbestos use has disappeared altogether. There was a very effective fight put up against the environmental ban by both the scientific and the industrial community. As Dr. Ross mentions, he started working on educating the medical community and the public on the mineralogy of asbestos as early as 1978. Right up until 1984, he thought that he was making progress.

However, the anti-asbestos campaign was also building. In 1979, the EPA came out with its first "Guidance Document" for schools on asbestos abatement. In this document, they discouraged air sampling as an "inappropriate" method for determining the asbestos danger. The report argued that

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5. Marjorie Mazel Hecht, "Scientists Score DDT Ban," *21st Century Science & Technology*, Summer 1992, p. 48.

We are both chemists and have been familiar with asbestos for many years, dating back to our university days. We would like to show you why continuing the use of asbestos is not only safe, but very important to the economy of the United States.

Asbestos products, especially those that are already in place, like asbestos roofing felts, flooring felts, vinyl asbestos tile, asbestos cement pipes, and asbestos clothing, which the Environmental Protection Agency (EPA) proposes to eliminate, are not dangerous, because they do not lose their fibers into the air wherever they are—on the ceiling, on the roof, or on the floor, even during a fire. In order to release asbestos fibers into the air, the asbestos has to be mechanically chipped, sanded or ground.

Asbestos is and can be dangerous for workers who are working in the asbestos industry, where asbestos is being ground by industrial machines. For such industries, there are special health safeguards to protect the workers by having them wear masks, etc.

During a fire, asbestos insulation on pipes stays practically unchanged. But, during a fire, a modern substitute for asbestos for pipe insulation does pollute the air with soot and gases which are very toxic. The modern plastic

handles of many tools—for example, screwdriver handles—can burn up in a few minutes. The fumes from one small plastic handle of only a few ounces can kill everyone in the room where the fire took place.

But the handles that are made of a mixture of plastic and asbestos either don't burn at all, or only smolder very slowly. Everyone caught in a fire in the same room could either leave or put out the smoldering item.

We would also like to note, that the injection of asbestos fibers into animals, causing sickness in the animals, does not indicate that breathing these fibers will cause lung cancer. For instance, a cow which is eating hay and is breathing near hay for years will still give healthy milk and does not get lung cancer. However, an injection of hay fibers can kill this cow, or make her sick, depending on the quantity of the injection.

Already a lot of damage has been done to the asbestos industry. In 1973, in the United States, 875,000 tons/year of asbestos products were being used. By 1984, because of the persecution campaign against asbestos, only 240,000 tons were used.

Asbestos products are safe, not toxic. U.S. school buildings need asbestos products.

—Paul and Natalie Lysenko

just because one sample showed low amounts of asbestos, this was not sufficient to prove that those levels existed at all times.

Instead, the EPA recommended that the health risk be determined by a subjective, visual inspection. If any asbestos-containing (“friable”) surfacing materials were found, the EPA recommended removal, enclosure, or deferred action. If a contractor came in and cleared out the asbestos, only then was an air sampling test allowed, and the contractor was relieved of liability only if the asbestos particle measurement were less than 0.005 fibers/cubic centimeter. The EPA published seven versions of this “Guidance Document” over the next 10 years, and the political pressure to ban asbestos kept growing. Only in its last report, in 1990, did it publish the long-proven facts that the asbestos hazard is dose-dependent, and that asbestos removal could potentially result in an *increase* in exposure to the building occupants.<sup>6</sup>

Not coincidentally, 1990 is the same year that Dr. Brooke Mossman and four colleagues published an article in *Science*, the magazine of the American Association of the Advancement of Science, which stated, “The available data and comparative risk assessments indicate that chrysotile asbestos is not a health risk in the non-occupational environment.”<sup>7</sup> This article convinced the scientific community on the issue, and must have influenced the EPA, which published a report echoing such conclusions that same year. However, the lack of publicity and the continued bombardment of uninformed contrary opinions have prevailed.

The time has come to take a long, hard look at our society’s fear of this very useful mineral. All that the EPA has succeeded in doing with its anti-asbestos campaign, is to engender irrational fear in the population and to smother a natural excitement for new discoveries. This irrationality can no longer be accepted.

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## Interview: Malcolm Ross

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# Bringing sense to the asbestos issue

*Dr. Ross is a research mineralogist with the U.S. Geological Survey in Reston, Virginia. He has worked closely with Dr. Brooke Mossman and others who have been instrumental in disproving the myth that “one fiber of asbestos can kill.” Ross was the recipient of the Distinguished Service Award from*

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6. Richard Wilson, et al., “Asbestos in New York City Public School Buildings—Public Policy: Is There a Scientific Basis?” *Regulatory Toxicology and Pharmacology*, 20 (1994), pp. 161-169.

7. B. Mossman, et al., *Science*, Vol. 294 (1990), p. 294.

*the Department of Interior in 1986. He was interviewed by Elisabeth Pascoli.*

**EIR:** Could you tell us the background of your work on asbestos?

**Dr. Ross:** I’ve been at this for 20 some years, trying to bring sense to the asbestos issue. I attempted as early as 1978 to get the abatement issue stopped. I was making real headway until 1984, and then things got turned around. The issue broke loose and the United States spent \$100 billion on this. Finally, in 1990 the EPA said that in most cases it is not necessary to remove asbestos from buildings, *but they didn’t publicize it. They still haven’t publicized it.* And we’re still spending several billion dollars a year.



I have written about this, as a lot of other people have. This is just one of these issues where the regulator says that there is a witch out there, and then they pour publicity and money into it, and then everybody believes it. We go through this ordeal year in and year out. That’s a nutshell version.

**EIR:** Ninety-five percent of the asbestos used in the United States is of the chrysotile type (see accompanying article). Do you believe that chrysotile is toxic?

**Dr. Ross:** If improperly used, where there is a lot of dust for years at a time, yes. The asbestos workers, the insulators, were exposed year in and year out to large amounts of dust. Over the years they were injured, there’s no doubt about it. But it’s a matter of amount. The difference makes the poison. And the small amount that we are exposed to in a non-occupational setting is of no account whatsoever.

**EIR:** What are the health dangers of asbestos, and especially chrysotile? It is said that the danger of asbestos is related to the size of the airborne fibers. Is it true that chrysotile, due to its serpentine structure and strong bonds, cannot break off in particles small enough to be dangerous?

**Dr. Ross:** Well, chrysotile in a way is the tiniest particles of the six types of asbestos crystals. It forms the tiniest particle and yet it is the least toxic. It is also somewhat soluble, and the magnesium part of the crystal structure leaches out in the lung. It is removed, and that sort of destabilizes the whole fiber. That’s one thought.

But really, there is no overall theory on just why some of these are more dangerous than others. As soon as you begin to say, “Well, it is because of the thickness of the particle,” then you have to say, “Well, chrysotile is the thinnest, and yet it is the least dangerous.”

So, you really can’t come up with one good reason why