The Great Asbestos Scam

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A fibrous family of minerals is under attack, even though its most important member proves to be low risk.

Is asbestos a major threat to health? The U.S. Environmental Protection Agency (EPA) has convinced Congress to pass legislation requiring all schools in the United States to inspect for the presence of asbestos and, when present, to remove it.

Yet in the world community, asbestos is not considered a significant hazard. Rigorous studies in the United Kingdom, Sweden, Canada, and the United States testify to the relatively minor risk posed by asbestos. Complicating the issue is the grouping of several diverse minerals under the label *asbestos*: While all have similar properties that make them useful materials, they vary widely in health risk.

When the low risks of asbestos are balanced against its life-saving uses, one comes to realize that the legislation aimed at eliminating asbestos may create more problems than it proposes to solve. I consider the current asbestos policy and programs in the United States a huge scam. As an educator and scientist, I know the necessity of fully investigating any topic before drawing a conclusion, but regrettably, the EPA has not done so with asbestos.

■ *A sign warns citizens of the perceived hazards of asbestos fibers.*

Asbestos Minerals

There are two types of asbestos minerals: chrysotile asbestos and amphibole asbestos. Chrysotile is a hydrated magnesium silicate, one of the serpentine group of minerals commonly found in geologically altered, high-magnesium rock.

The amphibole group of minerals is extremely common in nature, but only a few varieties —crocidolite, amosite, tremolite, actinolite, anthophyllite—are asbestos-like. In nature, all amphiboles form elongated crystals and are fibrous to some extent. These amphibole asbestos minerals are all hydrous silicates that contain magnesium as well as iron in some cases. Crocidolite contains some sodium, and tremolite and actinolite contain calcium.

Chrysotile accounts for more than 90 percent of the total asbestos used in the world, while crocidolite and amosite dominate the rest. Asbestos minerals have unique chemical and physical properties. The types with the greatest length-to-diameter ratio, chrysotile and crocidolite, are not only flexible but also have very high tensile strengths. All the asbestos minerals have excellent chemical and thermal stability; they are incombustible and acid-resistant. These properties make asbestos an excellent material for such things as fire retardants, brake linings, insulation, flooring and roofing materials, textiles, and packing materials. In many uses, including brake linings, there are no good substitutes for asbestos.

The fibrous nature of asbestos is, however, of concern to the health community. While the Occupational Safety and Health Administration (OSHA) defines a fiber as a particle of at least five microns in length, with a length-

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■ Top: *Chrysotile asbestos. Comprising about 90 percent of all industrial asbestos, this fiber tends to ball up like wool and is not easily absorbed by the body.*
■ Bottom: *Crocidolite asbestos. One of the class of amphibole fibers, which are needlelike and more of a hazard to the lungs.*

to-diameter ratio (L/D) of three or more, mineralogists argue that this description is too broad and that the term *fiber* should be restricted to material with L/D of at least 20. They point out that many minerals can, when crushed, yield fragments with L/D of three or more; certainly these are not all fibers.

Many health studies indicate some causative link between amphibole asbestos and illness. At the same time, no such correlation is found for chrysotile. In fact, several nations clearly differentiate between amphibole and chrysotile asbestos, with fewer fibers per unit of air allowed for the former than for the latter. Even in the United States, the American Conference of Governmental Industrial Hygienists (ACGIH) makes similar recommendations. The ACGIH position is based on a great many studies that demonstrate the very low risk of chrysotile asbestos. Unfortunately, their recommendations have been totally ignored by both OSHA and the EPA.

Asbestos Environscare

Almost universally the media —including some of the scientific literature, popular magazines, and especially the EPA—have branded asbestos a killer of almost epidemic proportions. Joseph Califano, former secretary of health, education, and welfare, has estimated 67,000 fatalities per year from asbestos, mainly for lung cancers, while Irving Selikoff of Mt. Sinai School of Medicine has estimated 10,000–20,000 deaths annually.[1] At the same time M.D. Hogan and D.G. Hoel have stated that each year 12,000 people will die as a result of exposure to asbestos.[1] Further, others have stated that asbestos causes "death and disease on a scale akin to that of modern warfare."[2]

1. B. Wall and J.M. Hughes, "Asbestos as a Public Health Risk: Disease and Policy," *Ann. Rev. Public Health* 7 (1986): 171–192.

"It remains uncertain whether any type of asbestos acting alone can cause lung cancer in nonsmokers."

There is a problem with such figures, however. They are not only wrong, they are radically wrong.

The EPA, apparently without considering the in-house advice of its experts on asbestos, has taken the stand that there is *no* safe level of asbestos in any form; that is, zero risk to public health can be obtained only at zero levels. (This is the so-called linear hypothesis, where high dose and known health risk effects are extrapolated linearly to zero.) Therefore, in response to greatly exaggerated fatality figures, fanned by the press and with consequent public pressure on politicians, the EPA has banned the use of asbestos in public schools, and use of asbestos will be phased out elsewhere in the United States over the next two decades.

While in-house scientists from the EPA rank asbestos in a low-risk category, asbestos is

2. R. Drucker et al., "Exposure of sheet-metal workers to asbestos during the construction and renovation of commercial buildings in New York City," *New York Academy of Sciences Annals* 502 (1987): 434.

■ ***Workers wear full protective gear to remove asbestos from this factory. Research has shown that asbestos is more harmful when removed than when left in place.***

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■ *Brake linings remain a principal use for asbestos. No successful alternate material is yet known for this application.*

still perceived by regulators as one of the highest risks to public health. In a recent document, EPA scientists note that combined cancers from four substances, formaldehyde, tetrachloroethane, methylene chloride, and asbestos, may total 250 per year.[3] How does this low figure correspond to the thousands of cancers per year estimated by EPA from asbestos alone? Why has its official position remained unchanged?

Asbestos in brake linings certainly provides obvious benefits; the EPA, however, has ordered removal of asbestos even though the use of inferior substitutes may lead to fatalities due to brake failures. Thus, will replacing asbestos in brake linings *save* lives? Similarly, replacing asbestos in its fire retardant applications will no doubt cause more fatalities due to conflagration. (There are about 5,200 deaths in fires each year in the United States.) The net result: More lives could be lost than saved by maintaining the current policy.

Health Effects

There are several diseases that may possibly be traced to asbestos materials. Asbestosis is a type of pulmonary fibrosis that results in general overall lung weakening; in some cases heart failure may result. For a long time asbestosis was a major concern, and numerous cases were documented from the 1930s to the 1960s, when conditions in the workplace were less stringent.

Mesothelioma, a cancer of the lung lining, is almost always terminal, and it is estimated that 80 percent of these cases are due to inhalation of asbestos fibers —specifically crocidolite—and less commonly to other amphibole asbestos varieties. Especially prone to mesothelioma are crocidolite miners, their families who lived near the mines, and particularly crocidolite asbestos industrial workers. Since the latency period for this disease is about 35-40 years, most deaths occur in people over age 60. In the United States, cases of mesothelioma will continue to diminish each year as most exposures to

3. R.D. Morgenstern et al., "Unfinished Business: A Comparative Assessment of Environmental Problems—Overview Report," Feb. 1987, 28.

The incidence of lung cancer among the asbestos miners' families was below that for the Canadian public.

crocidolite and mixed crocidolite-chrysotile took place 40-50 years ago. Even so, mesothelioma remains a rare cancer. In Turkey, however, mesothelioma is linked to a fibrous zeolite, erionite, which is a complex hydrous alumino-silicate of calcium, potassium, and sodium, very unlike the ferromagnesian amphiboles crocidolite and amosite.

Lung cancer caused by exposure to asbestos is of prime concern to many people; yet, the available data are confusing. "It remains uncertain whether any type of asbestos acting alone can cause lung cancer in nonsmokers," according to a recent study in the *New England Journal of Medicine*.[4] Very simply, the incidence of lung cancer in asbestos workers who smoked is high; the rate among nonsmoking asbestos workers is so low as to make any causative relationship open to question.

For some years Malcolm Ross of the U.S. Geological Survey has been researching asbestos and its health effects. In 1984 Ross noted that combined asbestosis, mesothelioma, and lung cancer (along with other cancers) due to exposure to asbestos may be as high as 500 per year, but certainly not in the high tens of thousands as commonly reported in the media.[5]

Further, Ross summarizes the data for families of asbestos miners in the chrysotile-mining towns of Asbestos and Thetford Mines in Quebec, Canada. Here, the data are for nonminers as, almost universally, the miners smoked during their working years. The level of asbestos dust in the air often reached hundreds of fibers per cubic centimeter, and although dust control was attempted, high fiber levels persisted. Nevertheless, the incidence of lung cancer among the asbestos miners' families was below that for the Canadian public. Moreover, the drinking water used by the miners and their families reached the incredible range of 170 million to 1.3 billion fibers per liter, yet the incidence of cancer among the miners' families was not above normal.

Although the U.S. National Research Council has proposed that a high asbestos fiber content in drinking waters can lead to gastrointestinal and other cancers, no substantial data have been presented.[6]

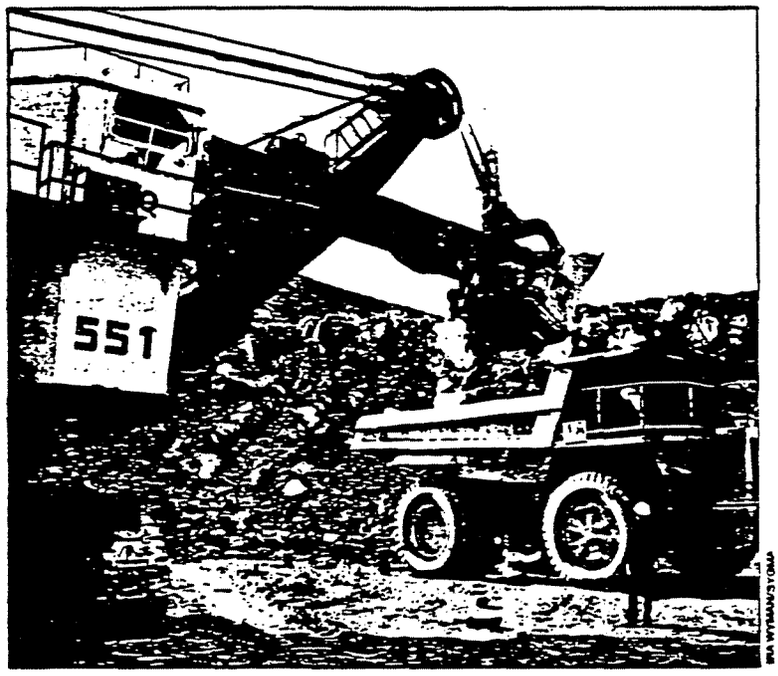
The lowest incidence of lung-related diseases was found among workers in chrysotile mines and among their friction product manufacturing cohorts. Early data suggested a chrysotile asbestos and cancer link, but when the data for chrysotile miners and textile workers with either lung cancer or mesothelioma were reinspected in fine detail, contaminants of amphibole asbestos were found to be present or the cohorts had had a history of smoking.

Chrysotile asbestos commonly occurs as fibrous bundles, and these bundles may be blocked from entering the deep lung at bifurcations in the lung airway. Further, magnesium is somewhat more readily leached from chrysotile than from the amphibole asbestos minerals, which are not formed in fibrous bundles and therefore commonly reach the deeper parts of the lung where

4. B.T. Mossman and J.B.L. Gee, "Asbestos-related Diseases," *New England Journal of Medicine* 320 (1989): 1721-30.

5. M. Ross, "A survey of asbestos-related disease in trades and mining occupations in factory and mining communities as a means of predicting health risks on non-occupational exposure to fibrous materials," American Society of Testing and Materials, Special Technical Publication, no. 834 (1984): 51-104.

6. National Academy of Sciences, National Research Council, *Asbestiform Fibers: Nonoccupational Health Risks* (Washington: National Academy Press, 1984).



damage develops. Whether the cancers associated with asbestos are a direct consequence of exposure or whether the asbestos amphiboles act as cocarcinogens is not known. The available data, however, overwhelmingly support the generally innocuous nature of chrysotile in rocks and in many industrial applications.

Chrysotile by itself does not carry a high risk factor, and can be used, with few exceptions, for all asbestos products. It would be wise therefore to replace crocidolite and other amphibole asbestos with chrysotile.

■ *Miners remove raw asbestos ore at Black Lake, Quebec, Canada. Nearly all studies linking asbestos to lung cancer were done on asbestos miners, most of whom also smoked.*

Naturally Occurring Asbestos

It is interesting to note that many in the United States have been subjected to extremely high background fiber content in air and in water. In the mid-1970s, the National Research Council reported (for rural areas of the United States and presumably all such areas in the world) that fiber is a naturally occurring constituent of air at about 10 fibers per liter. At the same time, the fiber content in water is tens of thousands to millions of fibers per liter.

Amphiboles are, as mentioned above, extremely common components of many rocks. But amosite is mined only in the Republic of South Africa, while crocidolite is mined only in South Africa and Australia. Should we be concerned about all amphibole-bearing rocks? Reported geographic patterns of disease and death do not indicate a correlation with amphibole content.[7]

Serpentinized rocks in California are commonly very rich in chrysotile, as are many metamorphoesed dolomites. The air and water in these areas are often quite high in fibrous mineral content; yet there are no abnormally high incidences of lung cancer, mesothelioma, or asbestosis. Nevertheless, near San Jose, California, a dike cuts through serpentinized rock containing small amounts of chrysotile asbestos, and the EPA has designated this a superfund site!

The Schools and the Scam

And now for what amounts to the greatest scam of all: the mandated removal of asbestos materials from our public schools. First, the EPA has reported that at least 50 percent of all air in U.S. schools ranges between 0.00003 and 0.03 fibers per cubic centimeter (ambient air is generally recorded at .01 f/cm³). Second, there are no data to support a causative link to cancer from occasional inhalation of low-level fibers. Third, the EPA, through the Asbestos Hazard Emergency Response Act (AHERA), is now

7. H.L. Cannon and H.C. Hopps, "Environmental Geochemistry in Health and Disease," *Geological Society of America Memoir* 123, (1971).

mandated to interact with all school officials to inspect and remove all asbestos from our public schools; it has neither provided the methods for determining safe levels nor the guidance for removing asbestos. Fourth, the EPA, fueled by a willing media, advocates that any and all asbestos will kill our schoolchildren: There is "no safe level of asbestos (all types)." Last, the decision for mitigating asbestos is left to school boards, special interest groups, eager contractors, and lawyers—few of whom have the background or understanding to differentiate between chrysotile and crocidolite. Often the tremendous price tag will fall upon the taxpayer without saving a single life.

To emphasize the absurdity of the EPA stand on asbestos in schools, just consider that the quantitative risk assessment by researchers from Tulane Medical School, who argue, even for somewhat inflated estimates of airborne fibers, an annual mortality rate of 0.02 to 0.30 per million (assuming five years attendance in the school, and an average life expectancy of 75 years). This vanishingly small range for humans aged 5-14 is compared with other risks per million population (fatalities per million in parentheses): Long-term smoking (1,200), home accidents (60), drowning (27), bicycling (15), high-school football (10), natural radiation from building materials (10), and four tablespoons of peanut butter a day (8).[8]

Further, leaving most asbestos where it is poses less threat than its removal. When removal has been undertaken, the fiber content per unit of air has increased.[9]

In Canada, the Royal Commission of Asbestos (RCA) has thoroughly investigated the risk from asbestos in the schools. They find the risk so slight as to warrant its removal neither from schools nor from any buildings maintained in a normal fashion.

In the United States, the price tag for an unnecessary cleanup will range from $100-$150 billion, excluding the cost of the inspection. Yet no lives may be saved by this action.

Let's ask who benefits from asbestos cleanup. Contractors will be paid handsomely, and politicians will get good press and subsequent votes when the media and environmental groups urge compliance with the laws. Lawyers will prosecute, and the EPA will receive federal funds to perpetuate huge power groups. Who pays? You and I and others like us.

My objection is not with intended goals of sound environmental policy but rather with huge sums being spent at the expense of other worthwhile programs and without any positive impact on public health. The EPA has not been willing to listen to its own scientists concerning OSHA's stand on asbestos. The EPA is willing to ignore tremendous amounts of high quality scientific research, while giving its attention to sadly undereducated environmentalists who accuse it of abandoning the environment.

Conclusions

It has been clearly documented that there is a low risk of chrysotile asbestos. This is true not only in the United States but also, convincing studies demonstrate, in Canada, the United Kingdom, Sweden, and other countries. Since this amounts to at least 90 percent of asbestos, then one can legitimately challenge the policy set by OSHA, the EPA, and other environmental "watchdogs." Replacing amphibole asbestos with chrysotile asbestos will allow us to take advantage of this excellent material while at the same time eliminating the very real, albeit small, risk from amphibole asbestos.

Finally, it is apparent that the EPA should reevaluate its data and take the initiative to educate the public. Its orders and recommendations for asbestos removal and phaseout must be rescinded.■

8. Wall and Hughes, "Health Risk."

9. Wall and Hughes, "Health Risk."

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