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THE ASBESTOS PROBLEM

An asbestos curtain was once the very symbol of safety and security. When primitive stage lighting made the risk of theater fires a constant worry, the presence of a fireproof curtain reassured audiences that a blaze could be contained long enough for them to escape it. Now the tables are turned; disease caused by asbestos has become a matter of serious concern.

Since antiquity, asbestos had been made into such items as permanent lamp wicks or novelty fabrics that would not burn. But early in this century, the use of asbestos grew like wildfire (so to speak). A potential health hazard was suspected very early, but it wasn't until the 1960's that its full magnitude became evident.

THE MATERIAL: Asbestos is a family of similar minerals that all occur naturally as a kind of soft rock made up of compressed fibers. One of the best insulators known, it protects what it covers from heat, corrosion, or electrical damage. It is also strong and durable. The mineral fibers can be handled in ways similar to vegetable fibers; they can be spun, made into felt, or bonded with other substances to form durable materials.

By now there are 3,000 uses of asbestos. Insulation for buildings is made from the material; huge amounts have also been used to insulate boilers and pipes in ships; automobile brake linings and clutch plates have been made of asbestos since the early 1900's. Asbestos has been incorporated into cement to strengthen it for use in pipes and other formed objects. Asbestos filters are used in the manufacture of some imported wines. For many years, hair dryers were insulated with the material. Until recently, asbestos was commonly incorporated into the spackling and taping compounds used for drywall construction. From 1946 to 1973, asbestos was added to coatings that could be sprayed onto walls or other structures in lieu of plastering them.

In all, some 30 million tons have been used in the United States since the beginning of this century, and by its end, according to one estimate, some half a million people will have died as a result of their exposure to asbestos.

THE PROBLEM: Asbestos produces disease only when it is inhaled (or possibly swallowed). Minuscule fibers of the material (some too small to be seen with a standard microscope) are drawn into the lungs. There the fibers are taken up by cells responsible for cleaning the air passages, but these fibers cannot easily be broken down for removal. Instead, the fibers remain in place or migrate slowly toward the periphery of the lungs. Some may even travel across the diaphragm into the abdominal cavity (peritoneum), whereas others probably arrive there after being swallowed.

It appears that asbestos creates problems solely because of its physical properties, not because of its chemical nature. The tiny size of asbestos particles is important; if they were larger, the frag-

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ments would settle out in the large airways, which are better equipped to remove foreign substances than the very small ones. The shape also matters: needle-like dimensions, which are typical of the asbestos crystal, appear to increase its ability to cause disease. Unfortunately many of the possible substitutes for asbestos, such as certain newer types of fiberglass, acquire these characteristics in the process of being developed into better insulators. In other words, the desirable properties of asbestos as an insulating material are also the ones that make it dangerous. Even so, it appears so far that asbestos is more potent in causing disease than other effective insulating substances, such as fiberglass and rockwall.

Thirty or so years after asbestos dust is inhaled, but sometimes much sooner (depending on dose), it begins to cause several types of detectable disease:

(1) Asbestosis is a sometimes fatal condition, that results from significant, but not necessarily heavy exposure. It hardly ever occurs except in people who have worked with asbestos or with products containing it. This is, however, the most common disease produced by exposure to the material, though not the most common cause of death, which is lung cancer. Asbestosis is a kind of scarring process, one that takes place within the lung tissue itself or on its outer surface. Asbestosis causes the air spaces to become smaller or obstructed , and the lung itself to become more rigid. There is no effective treatment to prevent or reverse the scarring. As a result, breathing is difficult, oxygen and carbon dioxide are poorly exchanged, and lung infections are easily acquired. This disease or its complications can progress, even without further exposure to asbestos.

Lung infections, such as pneumonia or bronchitis, are extremely threatening to people with asbestosis. They should be vigorously treated, usually with antibiotics, at the first sign of a respiratory infection. Stopping smoking is critical: cigarette smoke not only makes asbestosis more dangerous, difficult to live with, and hard to treat, it markedly increases the risk of lung cancer in anybody who has been exposed to asbestos.

(2) Lung cancer is extremely common among people who have worked with asbestos, many of whom smoke. For some unknown reason, the combination of cigarette smoke and asbestos is much worse than would be predicted by adding together the risks from each. Anyone who has been exposed to even small quantities of asbestos dust should do everything he or she can to stop smoking. The outlook for those who stop is much better than for those who continue. As is the case with all lung cancer, by the time symptoms occur, it is usually too late for curative treatment, and no good tests for earlier detection are available.

(3) Mesothelioma, several other types of cancer, occur mainly in people exposed to asbestos dust. These tumors arise from the membrane that lines the chest or abdominal cavity, and they are highly malignant. Although they are rare, mesotheliomas can occur even after a limited exposure to asbestos dust and may affect people who were not directly involved in handling the material, such as relatives of asbestos workers. A very long time — forty years or more — can elapse between exposure and the appearance of mesothelioma, although many cases appear earlier.

Some other types of cancer, occurring outside the lungs, also appear to be somewhat more common in people exposed to asbestos dust. A few other diseases may also be more common, and it appears that the suicide rate in former asbestos workers is as much as two to three times higher than in the general population.

WHAT TO DO?: The asbestos situation raises two questions: What can individuals do to protect themselves and their families? What should we do as a nation to prevent further injury from exposure to asbestos?

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