Asbestos: No Risk to the General Public

INTRODUCTION

In a wide variety of demanding uses, people all over the world benefit each day from asbestos. This fibrous mineral is somewhat unique since its primary function is to protect human life and property in most of the 3,000 different products in which it is used today.

Growing demand for this natural mineral in our modern society has focused attention on the possible health risks to the general public. This concern has been stimulated by medical evidence connecting the excessive inhalation of asbestos dust in occupational settings to increased risks from certain human diseases. Questions have been asked about the health risks, if any, presented by asbestos in our natural atmosphere, and for more than half a century doctors and scientists have searched for the answers.

Although hundreds of different animal, vegetable and mineral fibers are present in community air and their effects on human health are under scrutiny, many of the answers on asbestos already are documented. *To the extent that any asbestos fibers are present in our natural atmosphere, scientific evidence has not shown any health hazard for the general public.*

Strong support for the conclusion that asbestos poses no risk to the general public came in a report from the 33-member *Advisory Committee on Asbestos Cancers of the International Agency for Research on Cancer,* which is a division of the World Health Organization. Following a 1972 conference on the Biological Effects of Asbestos, this committee noted that *there is no evidence, either from experience or from scientific research, that anyone in the general public has ever contracted any asbestos-related disease from exposure to the minute amounts of asbestos found in community air.* The Committee also pointed out that these amounts in community air were many times lower than the levels considered safe in an occupational environment.

Understanding how asbestos can be hazardous to those who work with it and yet not pose any danger to the general public requires a knowledge of how and why asbestos is used, and of the scientific research that has been conducted with regard to people with occupational exposures in contrast to the general public.

ANCIENT USES OF ASBESTOS

The peculiar properties of asbestos have fascinated people since the mineral was discovered. Deriving its name from the Greek word meaning "unquenched" or "incombustible," asbestos in its raw state is as dense and compact as the rock which encases it. Yet, it can be separated into light, silky fibers resistant to fire and to extremely high temperatures, and able to withstand great tension without breaking. Asbestos fibers can be woven into noncombustible fabrics for fireproof curtains for theaters or protective garments for firefighters, or they can be added to other materials to produce floor and ceiling tile, roofing shingles, siding, asbestos-cement pipe and many other useful products.

Archeologists in Finland have unearthed objects which indicate the earliest known use of asbestos goes back some 45 centuries when the mineral was used to hold together pieces of pottery before the clay was baked.

According to legend, the Emperor Charlemagne owned a "magic" asbestos tablecloth which his stewards cleaned after royal banquets by throwing it into the fire and then retrieving it intact. History also records that Marco Polo found asbestos cloth on his journey to Asia.

PROVIDES SAFETY AND DURABILITY

In the twentieth century, asbestos has become an

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increasingly essential material in our improved way of life and expanding industrial economy. It has many vital functions in construction, transportation and industrial processes. It provides built-in protection against fire and deterioration in scores of common products in daily use. Through the years it has saved countless lives and billions of dollars in property damage by preventing or checking the spread of fire. Electrical installations are safer because of asbestos insulation materials. When used in packings and gaskets, asbestos promotes the efficient operation of industrial machines and pumps.

In transportation, the brakes on cars, trucks, buses and trains protect lives because asbestos enables them to resist extreme heat and friction.

OCCUPATIONAL RISKS AND CONTROLS

To meet the increasing demand for this valuable fiber, a worldwide asbestos mining and processing industry came into being.

As in many other mineral and materials industries, it became necessary to protect employees against occupational health hazards. It was found that some workers exposed to excessive asbestos dust over a period of years developed a nonmalignant lung disease called asbestosis. As with many similar conditions, asbestosis is time-and-dose-related—that is, it develops only after inhalation of excessive concentrations of asbestos dust over a long period of time.

Some medical studies have reported an association between the disease asbestosis and an increased risk of a certain type of lung cancer (bronchogenic). These studies have shown that bronchogenic cancer, with but one recorded exception, has occurred only in asbestos workers who smoked cigarettes during the time they experienced heavy and prolonged dust exposure. However, even though the number of such cases among workers heavily exposed to asbestos fiber is only a small fraction of the total employed, the industry considers the problem serious.

Bronchogenic cancer is the subject of considerable scientific research through statistical, clinical and pathological studies of exposed workers; through experimental studies with laboratory animals; and through studies of the physical and chemical nature of asbestos and associated minerals.

Health research also has indicated an association between asbestos exposure and mesothelioma, a rare cancer of the lining of the chest or abdominal cavities. This disease has a latent period that ranges from 30 to 45 years after initial exposure. Although widespread research is being conducted into the mesothelioma problem, the studies are complicated by a number of factors including the rarity of the disease and the fact that diagnosis still is considered a problem among medical experts. It appears that a variety of asbestos called crocidolite is more likely to cause mesothelioma than any of the other six varieties, including chrysotile asbestos, which accounts for about 95% of the world's production. Additionally, *studies also indicate there are other causes of mesothelioma besides asbestos.*

In recent years, the asbestos industry has invested millions of dollars in equipment and techniques to prevent the inhalation of asbestos dust by workers in the mining and milling of asbestos and in the manufacture of asbestos-containing products. A program of education and training is conducted for asbestos fabricators and applicators to provide them with a thorough understanding of potential risks and to encourage general adherence to sound industrial hygiene practices.

Studies in asbestos-using industries in England and the United States indicate that *where dust control measures have been taken, the risk of lung disease among the workers has been greatly reduced.*

STUDIES SHOW NO RISK TO PUBLIC

Because of the occupational health hazards associated with asbestos, some people who are concerned about general air pollution have raised the question of whether there is asbestos dust in the air in sufficient quantities to constitute a health risk to the general public.

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Studies of asbestos exposure and human health have produced *no* evidence of any health hazard to the general public from the use of finished asbestos products. Asbestosis does *not* occur among the general population; it occurs only among those with heavy occupational exposure. There is *no* evidence that anyone has ever contracted any disease from exposure to the wearing or weathering of brake linings, floor tile, roofing, or other products containing asbestos.

Brake linings in particular were the subject of a 1968 United States Public Health Service report. Jeremiah Lynch of the National Center for Urban and Industrial Health, U.S. Public Health Service, conducted the tests.[1] He concluded that any asbestos that might come from brake lining wear was *"an inconsequential health factor in urban air pollution."* The study provided scientific evidence refuting unsupported speculation that the wear of brake linings might be releasing many asbestos fibers into the air:

> **"Except in all but the most extreme driving conditions, only a very small fraction of the 30 to 50% asbestos present in brake linings escapes into the atmosphere as free fiber... the remainder is converted into some other mineral as a result of the extreme temperatures generated at small spots on the lining surface. Thus, although urban air contains a few free fibers as a result of brake lining wear, they represent a very small proportion of the total asbestos used in the manufacture of brakes. Many sources of the respirable fibers not associated with asbestos products have been identified, and the free fibers from brake lining wear appear to be an inconsequential health factor in urban air pollution."**

Other medical and scientific reports show that the occupational health risks from asbestos dust exposure do not extend to the public.

In 1967, P. E. Enterline, Ph.D., and M. A. Kendrick, Ph.D., reported on the reduction of asbestosis among workers in asbestos fabricating industries where protective measures have been taken.[2] They pointed out that the small amount of asbestos to which people in general may be exposed is of "little importance":

> **"...if very low-level exposures of populations to asbestos dust play any part in the pathogenesis (development) of disease it must be very small indeed....Asbestos dust at levels to which general populations are exposed probably is of little importance in the etiology (causation) of disease."**

"ASBESTOS BODIES" STUDIED

In the mid-1960's the question of public exposure was discussed in studies that reported finding so-called "asbestos bodies" in the autopsied lungs of some city dwellers who were not known to have been exposed directly to asbestos dust. The studies emphasized that these so-called "asbestos bodies" had no relation with either the cause of death or with any history or symptoms of pulmonary disease.

The authors of one such study, Drs. J. G. Thomson and W. M. Graves, noted that it would have taken a tremendous increase in the number of "asbestos bodies" found in the autopsied lungs to constitute even a minimal case of asbestosis.[3] They said in their 1966 report:

> **"It should be stressed that in spite of frequent asbestos bodies in the lung bases, none of this group had pulmonary disability and all died from other causes...to convert the scanty or very scanty bodies which we have demonstrated to be present in so many urban dwellers to the frequency present in a minimal basal asbestosis would require an increase by hundredfolds and to get a more diffuse classical asbestosis with pulmonary disability the multiplying factor might well be in many millions."**

In a similar study the same year, Drs. Lily Anjilvel and W. M. Thurlbeck noted that there is no risk of cancer to the general population from asbestos exposure.[4] These researchers said:

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"In our series there seemed to be no particular association between malignancy and the presence of asbestos bodies...asbestos bodies are not more common in patients with malignant disease in the autopsy populations we have studied, and thus casual exposure to asbestos is not an important cause of malignancy in the general population."

Other studies have raised the question of the real identity of these so-called "asbestos bodies." The term has for years been applied loosely to describe a tiny body of tissue in the lung containing a core of some inhaled particle—asbestos, talc, man-made fiber, or certain other common substances. The term "asbestos body" is misleading if the core substance has not been positively identified. Thus, it is not necessarily so that the finding of such "bodies" in city dwellers' lungs means that these people inhaled asbestos.

Because the cores of such "bodies" do not always contain asbestos, and because the overgrowth tissue contains some identifiable iron, Dr. Paul Gross, who has studied the problem extensively, has suggested that a more accurate name would be "ferruginous (iron-like) bodies."[5] Other specialists have now begun to refer to "ferruginous bodies" in their papers.

Dr. J. M. G. Davis, in 1967, deplored the "current furor over asbestos bodies—which recently appeared in the professional literature and was widely reported in the news media with varying degrees of sensationalism."[6] He commented specifically:

"...the basic assumption that asbestos-like bodies can only be produced from asbestos has proved incorrect and this casts considerable doubt on the theory that has been the chief basis of the asbestos 'scare.' "

OTHER CAUSES OF FIBROUS "BODIES"

Much research work is going on to develop ways of identifying the particles that may be the core of these "bodies." It has been shown that a number of substances can cause "bodies" in both humans and experimental animals.

L. J. Cralley and associates in the U.S. Public Health Service have discussed the great number of substances which might produce "bodies" in human lungs.[7] Publishing in 1968, they said:

"On the premise that the fibrous bodies observed in the lungs of persons at autopsy are all "asbestos bodies" and that coated fibrous bodies are a specific reaction to asbestos fibers, some investigators have concluded that asbestos fibers are significant air contaminants....Respirable fibers may be mineral, vegetable or animal in origin and may come from both natural and synthetic sources. There are well over a hundred different natural minerals with some degree of fibrous structure.... Respirable fibers of vegetable origin may be from both live and dead plant tissues....Animal fibrous materials include animal hair and scale, insect hair....Synthetic fibers include the newer ceramic fibers...as well as a wide range of established and emerging organic types used in textiles, fillers, containers, filaments, structural materials, etc."

Whatever their origin, the "bodies" that have been reported have not been connected with any disease, or with the cause of death, in the subjects studied. Even if some asbestos is among the variety of fibers in the air breathed by the public there is no evidence that it has any health significance.

SUMMARY

People throughout the world benefit from the many uses of asbestos—in schools, houses, theaters, ships, aircraft, offices and other public facilities, furnaces, boilers, firefighting equipment and in a myriad of everyday products.

With the twentieth century growth in the use of asbestos has come recognition of the need to cope with *occupational* hazards associated with excessive inhalation of asbestos dust. Much progress has

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been and is being made in protecting workers who handle asbestos fibers in mines, mills, factories and in some building and insulation trades.

Medical scientists studying the occupational health hazards of asbestos see no evidence that asbestos poses any risk to the general public. There is no evidence that asbestos dust is present in the general air in amounts of any significance to human health.

PERSPECTIVE

It is important to view in its proper perspective the expressed concern of some people that asbestos in the ambient air is a health risk to the general public.

Asbestos is by no means alone in being investigated as a possible health hazard. Literally hundreds of substances—as common and everyday as fuel oil, charcoal-broiled steaks, iron rust and egg yolks—are known or suspected of being cancer-causing agents under certain experimental conditions.

To forego the many benefits of these and other products of modern technology—simply on the basis of suspicions that are unsupported by medical evidence—would be a great and unwarranted disservice to the American public.

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