PLAINTIFF'S
EXHIBIT
GF-2326

January 15, 1968

ASBESTOS AND HUMAN HEALTH

INTRODUCTION

Asbestos, known since antiquity, has wide-spread and important applications in our modern industrial society. With the 20th century burgeoning of the uses of asbestos has come recognition of the need to cope with occupational hazards associated with excessive inhalation of asbestos dust. This statement summarizes the essential uses of asbestos, the known facts about health problems associated with occupational exposure to asbestos dust, and the research being conducted to identify and reduce these health risks.

AN ESSENTIAL PRODUCT

Asbestos has many essential functions in construction, in industry and in transportation. Over the years fireproof asbestos has saved thousands of lives and much valuable property. For safety, fire prevention and other reasons, products containing asbestos are used in schools, houses, theaters, ships, office and other public buildings, furnaces, boilers and firefighting equipment. The brakes on automobiles, trucks, buses and trains are dependable because asbestos is a major component of brake linings.

WHAT IS ASBESTOS?

Asbestos (from the Greek "unquenched") is the name given a family of mineral fibers comprised of three major types -- chrysotile, crocidolite and amosite -- each of which differs from the other; physically and chemically. Studies of the relationship between asbestos and health are complicated by this diversity.

Chrysotile is a white magnesium silicate, can be attacked by acids, has a positive electrical charge, is flexible and not easily pulverized. Crocidolite is a blue ferrous sodium silicate, is acid-resistant, has a negative electrical charge, and is less flexible than chrysotile. Amosite is a ferrous magnesium silicate with a negative electrical charge, is brittle and easily pulverized.

In the United States, chrysotile, amosite and crocidolite are all used, but chrysotile is by far the most common, accounting for about 90 per cent of the asbestos consumed in this country.

NO RISK SHOWN FOR GENERAL PUBLIC

In studies of asbestos exposure and human health, research has not shown evidence of any risk to the general public from the use of finished asbestos products. There is no scientific 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

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The lungs of workers known to have repeated exposure to the inhalation of asbestos fiber over a period of months or years contain myriads of small microscopic sized structures composed of a fiber coated with layers of protein and iron pigment. The fiber within the coating, under the circumstances, is assumed to be asbestos and the small unit therefore is called an "asbestos body." These bodies are found in the lungs of those who are occupationally exposed to asbestos fibers, regardless of whether or not there is any coexisting evidence of asbestosis. Therefore, the bodies, as such, are not an indication of disease but rather only of previous exposure to asbestos fibers.

Recently, by utilizing special techniques, it has been shown that the lungs of persons from the general population rather frequently contain a very scant number of similar small bodies composed of a fiber coated with protein and iron pigment. In these instances, it cannot be assumed that the fiber of these bodies is "asbestos," since other fibrous materials are known to develop a similar appearance within the lungs. For the present, the term "ferruginous" or iron-coated body is more appropriate.

The finding of ferruginous bodies in such small numbers in no way indicates that disease caused by asbestos fiber coexists and the presence of such bodies does not, in any way, justify a diagnosis of asbestos-caused disease. If it is ultimately shown that these small bodies are in fact protein covered asbestos fibers their wide dispersion in the population would not be too surprising in view of the many opportunities, from baby powder to building construction, for a small number of asbestos fibers to exist from time to time in the air that the general public breathes. The presence of these few fiber bodies in the lungs of the majority of the population is not associated with specific lung disease but simply reflects the chance inhalation of fibrous material. The complete implications of large numbers of ferruginous bodies within the lungs await further research.

KNOWN AND SUSPECTED OCCUPATIONAL RISKS

For workers who handle asbestos fibers in mines, mills, factories, and some building and insulation trades, the industry shares with doctors, public health officials and others involved in industrial medicine a concern about possible health effects from excessive on-the-job exposure to asbestos dust.

ASBESTOSIS: The industry long ago recognized the risk of a particular lung disease called asbestosis among some workers and took steps to safeguard employees. This non-malignant disease is brought on after inhalation of excessive concentrations of asbestos dust over a period of many years.

Asbestosis is one of the lung diseases called pneumoconioses. Others are silicosis, from silica (stone) dust; talcosis from talc; anthracosis, from coal dust. These are considered industrial health risks against which the various industries have instituted protective measures.

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For years, the asbestos industry has taken protective measures to reduce excessive exposures to asbestos dust and the risk of asbestosis among its workers.

BRONCHOGENIC (Lung) CANCER: The industry is aware of some medical studies that have reported an association between excessive exposure to asbestos dust and an increased risk of a certain type of lung cancer (bronchogenic). Even though the number of these cases among asbestos industry workers is only a small fraction of the total employed, the industry considers the problem a serious one. It has become 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. Recent studies have suggested that the trace metals often found with asbestos dust (nickel, cobalt and chrome) should be examined more closely.

In 1967, results of a study of deaths occurring among a group of insulation workers indicated that occupational exposure to asbestos greatly increased the risk of lung cancer but only among cigarette smokers. Although the number of deaths involved was small, the study showed no cases of lung cancer among insulation workers who were non-smokers.

MESOTHELIOMA: Also under study is a rare disease called mesothelioma, a tumor of the chest and abdominal cavity which is different from bronchogenic lung cancer. Recently, investigators have associated a frequency of cases of mesothelioma with exposure to asbestos in certain geographic locations. This was originally reported from South African areas where only crocidolite asbestos is produced.

Mesothelioma has been reported so infrequently that there are no accurate figures on its occurrence in the U. S. as a whole. In Britain, only two cases are currently being reported for every thousand cases of lung cancer. The search for the cause of such a rare disease is difficult, particularly since medical people themselves do not agree on its diagnosis and recognition. The asbestos industry, through research grants, is seeking more knowledge about mesothelioma.

INDUSTRIAL HYGIENE AND PREVENTIVE MEASURES

Today, 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. Johns-Manville continually strives to eliminate dust exposure in the mines and plants which it operates. Processing areas and machinery are equipped with dust-collecting devices. Atmospheric dust levels are regularly monitored. Filters and ventilators have been installed. Individual respirators are used where indicated. Employees are given physical examinations, including chest x-rays, on a scheduled basis.

A program of consultation with asbestos fabricators and applicators is carried on to provide 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 U. S. indicate that where dust control measures have been taken, the risks of lung diseases have been reduced.

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ASBESTOS AND HEALTH RESEARCH

Scientific research to identify and reduce the health risk from asbestos dust exposure is being conducted in many places throughout the world. The asbestos industry both sponsors such research and cooperates in work being done by government agencies and private medical investigators.

Johns-Manville has extended full cooperation to the U. S. Public Health Service in its study of asbestos processing plants. In addition, the company provides funds, asbestos materials, equipment and information, as the individual situation may require, for research of such organizations as: The Industrial Hygiene Foundation of America, The Asbestosis Research Council (headquartered in Great Britain), The Institute of Occupational and Environmental Health in Montreal, The Environmental Health Center at Mt. Sinai Hospital and others. Johns-Manville also conducts studies on technical aspects of asbestos in its own Research and Engineering Center at Manville, New Jersey.

Among the subjects scientists are now exploring are: the specific identification and health significance of fiber-like (ferruginous) bodies found in lung tissues; the health of asbestos mining, processing and fabricating workers compared with the general population; the relationship between cigarette smoking and cancer among asbestos insulation workers; the accurate identification of particles found in the air over a major industrial city; and the development and evaluation of the most effective industrial hygiene practices for use in the asbestos industry.

In cooperation and in conjunction with other agencies, the asbestos industry will continue to seek new information about the biological effects of asbestos fiber and to develop ways of assuring maximum possible protection from occupational hazards, for its employees in asbestos mines, mills and plants and among fabricators and applicators of this essential material.

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