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September 16, 1968

ASBESTOS AND THE GENERAL PUBLIC

People of virtually every nation in the world benefit from the many uses of the mineral, asbestos. Asbestos helps to build safety and durability into schools, houses, ships, aircraft and public buildings.

With the increasing use of this mineral fiber, the question has been raised as to whether asbestos, especially when suspended in city air, poses any health risk to the general public. The same question is being asked about many other materials in general use in our modern society. Medical and scientific research is being conducted to find answers. For asbestos, some of the answers are already in.

To the extent that any asbestos fibers are in the general air -- and there are literally hundreds of different animal, vegetable and mineral fibers in the dust of the air -- there is nothing to show that these are a health hazard for the public.

To see why this is so requires understanding of how and why asbestos is used, of some of the scientific research that has been conducted, and of the meaning of this research with regard specifically to those with occupational exposures in contrast to the general public.

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MODERN USES GROW OUT OF ANCIENT KNOWLEDGE

The word asbestos is from the Greek; it means "unquenched" or "incombustible." The peculiar properties of asbestos have fascinated people ever since the mineral was discovered more than 4,500 years ago. Although in the raw state it is as dense and compact as the rock which encases it, asbestos can be separated into light, silky fibers. These fibers have many uses. They can be woven into non-combustible fabrics for such things as fire curtains for theaters or protective garments for firefighters. They can be added to other materials to produce floor and ceiling tile, roofing shingles, siding, asbestos-cement pipe and many other useful products.

The earliest known use of asbestos goes back 45 centuries. Objects unearthed by archeologists in Finland indicate that it was used to hold together pieces of pottery before the clay was baked.

According to legend, the Emperor Charlemagne owned a "magic" asbestos table cloth which his stewards cleaned after royal banquets by throwing it into a fire, then retrieving it intact. Marco Polo found asbestos cloth on his journey to Asia and was told that it was woven from a salamander skin, but he later learned its true origin.

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MINERAL PROVIDES SAFETY AND DURABILITY

In the twentieth century, asbestos has become an increasingly essential material of an improved way of life and an expanding industrial economy. Asbestos 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 fires. Electrical installations are safer because of asbestos insulation. When used as packings and gaskets, asbestos promotes the efficient operation of industrial machines and pumps.

In transportation, the brakes on vehicles -- cars, trucks, buses and trains -- are dependable because asbestos is a chief component in brake linings.

OCCUPATIONAL RISKS AND STEPS TO PROTECT WORKERS

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

As in many other mineral and materials industries, the need developed to protect employees against occupational health hazards.

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It was found that some workers exposed to excessive asbestos dust over a period of years developed a non-malignant lung disease called "asbestosis." As with many similar conditions, asbestosis is dose-and-time related -- that is, it develops only after inhalation of excessive concentrations of asbestos dust over a period that averages 17 years.

Some medical studies have reported an association between the disease "asbestosis" and an increased risk of a certain type of lung cancer (bronchogenic). Even though the number of lung cancer cases among workers heavily exposed to asbestos fiber is only a small fraction of the total employed, the industry considers the problem serious. It 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.

In the recent past, 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 diseases among the workers has been greatly reduced.

NO RISKS TO GENERAL PUBLIC SHOWN IN STUDIES

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.

Studies of asbestos exposure and human health of the general public 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 long-time, heavy occupational exposures. 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. He concluded that any asbestos that might come from brake lining wear was "an inconsequential health

CONFIDENTIAL

October 24, 1966

TO: H. N. Bates
F. E. Dutcher
Roger Hackney
D. L. Hinmon
C. W. Hite
F. H. May, Jr.
R. F. Orth

TO: H. M. Ball
H. M. Jackson
K. V. Lindell
A. C. Smith
K. W. Smith

CC: C. B. Burnett
F. J. Solon, Jr.

POSITION PAPER ON THE HEALTH ASPECTS OF ASBESTOS

Attached is a copy of the position paper on asbestos, put together by the Task Force with Hill and Knowlton. This document, largely a result of Hill and Knowlton's initial search of medical papers, speeches, publication clippings, etc., presents a factual appraisal of the pros and cons and the best answers that are presently available, to the health claims made against asbestos.

This position paper is being given limited distribution, as indicated above. It is intended to serve as guidance material for discussions you find necessary to have with employees, customers, Q.A.M.A. members and the like.

It will also guide the actions of this Department in handling such problems as the recent Chemical Week article and in answering legitimate press inquiries in the future.

It is our plan to revise and re-issue this position paper as additional evidence or changing circumstances make appropriate.

Bill Raines

W. P. Raines

CONFIDENTIAL

October 11, 1966

Mr. Carl Thompson, Vice President
Hill and Knowlton, Inc.
150 East 42nd Street
New York, New York 10017

Dear Mr. Thompson:

The following are the paragraphs we reviewed in yesterday's discussion of the "white paper":

Page 2, Paragraph 2

Today, with the greatly improved health of the average individual, people are living longer. Life expectancy in 1920 was only fifty years--today it has increased to over seventy years. With this increased longevity, people now are developing many more chronic, disabling diseases than they did years ago. For example, fewer people today die at an early age from tuberculosis or rheumatic fever. They survive to develop chronic heart disease, arthritis and cancer typical of older age groups.

Page 5

Anthrophyllite is mined and processed chiefly in Finland. It is not associated with other medical conditions such as cancer, but great attention has been given to the association of this fiber with plueral plaques. It is interesting to note, without the X-ray film, this plaque formation would never have been discovered since few, if any, [redacted] individuals are disabled. The condition is really more of a [redacted] scientific curiosity than an indication of disabling disease.

Page 8, Paragraph 2

. . . the fact that the diagnosis of asbestosis itself still is difficult. Despite undeniable evidence of the disease and recent extensive reporting in the medical literature, the great majority of

physicians cannot diagnose asbestosis. In relation to other disease entities, asbestosis occurs so rarely that it is not on the teaching curriculum in medical universities and the average doctor has no exposure to a patient with this condition either in his training or in his practice.

Yours very truly,

H. M. Jackson
Director of Industrial Relations
and Management Development

Copy to: Mr. W. P. Raines

factor in urban air pollution." The study provided scientific evidence refuting much recent 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 a brake lining 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 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 Drs. P. E. Enterline and M. A. Kendrick reported on the reduction of asbestosis among workers in asbestos fabricating industries where protective measures have been taken. 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 (caustion) of disease."

SO-CALLED "ASBESTOS BODIES" NOT RELATED TO DISEASE

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. 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. L. Anjilvel and W. M. Thurlbeck noted that there is no risk of cancer to the general population from asbestos exposure. These researchers said:

> "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

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studied, and thus casual exposure to asbestos is not an important cause of malignancy in the general population."

Other authors 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 name "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 over-growth 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." 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." 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'."

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MANY THINGS BESIDES ASBESTOS MAY CAUSE 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. 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 orgin 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

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asbestos -- in schools, houses, theaters, ships, aircraft, offices and other public buildings, furnances, boilers, firefighting equipment and in a myriad of everyday products.

With the 20th 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 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 having the finger pointed toward it 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.

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The point is that nearly everything we use and create in our increasingly complex society has been suspected, by someone, of being a potential hazard.

To forego the many benefits of these 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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# #

July 1, 1968

ASBESTOS - - A FAMILY OF MINERALS

SUMMARY:

This paper sets forth some of the reasons why the term "asbestos" should not be used loosely in discussing medical questions.

There is no single mineral known as asbestos. "Asbestos" is a name given to a family of minerals. It includes two major groups, containing a total of six varieties of asbestos. Each of these six differs from the others, physically, chemically and inbiological effect. Any study of the effects of asbestos is complicated by this diversity.

Studies of both people and animals show differing types of reaction to the various types of asbestos. Animal studies of excessive exposure indicate that of the three major commercial types of asbestos, commonly used chrysotile is least likely to produce a reaction.

Because different varieties of asbestos produce different reactions, scientists are working on better methods for identifying the types of asbestos involved in their studies on human health. Other complications arise because trace amounts of mineral impurities are often found in samples of raw asbestos ore and refined fiber.

WPR/eb

VARIOUS TYPES OF ASBESTOS

Any attempt to assess the effect of asbestos on health is complicated by the fact that asbestos is not a single chemical or physical entity. "Asbestos" is a generic name given to a group of hydrated silicate minerals that have one common attribute, namely, the ability to be separated into relatively soft, silky fibers.

The known varieties of these minerals can be divided into two main classes on the basis of their crystal structures: serpentine asbestos and amphibole asbestos. The lone member of the serpentine class is chrysotile asbestos, which is by far the most common of the asbestos minerals. About 95 per cent of the asbestos used in this country is chrysotile,principally from mines in Canada.

There are five recognized varieties of amphibole asbestos: crocidolite, amosite, anthophyllite, tremolite and actinolite. Of the amphiboles, crocidolite and amosite have the greatest commercial significance, although the use of anthophyllite is increasing.

Each of the six types of asbestos differs from the others, chemically and physically. To add to the complexity, the chrysotile from one Canadian mine, for example, will differ in chemical impurities and in physical properties from the chrysotile from another Canadian mine.

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CHARACTERISTICS OF THREE MAJOR TYPES

Each of the three types of asbestos that are most important commercially - - chrysotile, crocidolite and amosite - exhibits distinguishing characteristics.

CHRYSOTILE - By far the leading producers are Canada and the Soviet Union. Smaller deposits are found in South Africa, Rhodesia, China, the United States and Italy. Chrysotile is a white serpentine asbestos and occurs in areas where serpentine rock was cracked by earth movement long ago and subjected to intense pressure and volcanic waters. This transformed some of the granular serpentine into fibrous chrysotile. Chemically, chrysotile is hydrous magnesium silicate with a magnesium hydroxide surface. It has a positive electrical charge. It can be attacked by acids. It is a flexible fiber and does not pulverize readily. Commercial fibers contain small and varying amounts of iron and calcium compounds, depending upon origin.

CROCIDOLITE - The bulk of the world's supply comes from South Africa. There are also small deposits in Australia, but they are no longer being mined commercially. It is an amphibole asbestos occurring in iron-rich sedimentary rock. Chemically, crocidolite is a ferrous sodium silicate with a silica surface. It has a negative electrical charge.

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It is acid-resistant. It is characterized by a deep blue color. Crocidolite is less flexible than chrysotile.

AMOSITE - The Transvaal district of South Africa is the only place where amosite is mined commercially. It is a member of the amphibole asbestos family, occurs in the same type of rock as does crocidolite, and has the same negative electrical charge, but is brown in color. Chemically, amosite is a ferrous magnesium silicate with a silica surface. It is also acid-resistant, but less so than crocidolite. It is brittle and pulverizes easily.

The major characteristics of these three types of asbestos are summarized in a table attached to this paper.

Because of the basic chemical and physical differences among chrysotile, crocidolite and amosite, it would be expected that overexposure to the three varieties would show varying biological effects. Scientific observation confirms this expectation. There seems to be broad agreement that chrysotile, the type of asbestos most heavily used in the United States, is least likely to produce asbestosis, a non-malignant lung disease brought on after inhalation of excessive concentrations of asbestos dust over a period of many years.

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ANIMAL EXPERIMENTS SHOW DIFFERENT EFFECTS

Dr. J. C.Wagner experimented with all three types of asbestos on various laboratory animals, and found that crocidolite produced the most severe asbestosis and that amosite was more than five times as likely to produce a reaction as chrysotile. He reported, in 1963:

> "With chrysotile dust it was possible to produce severe lesions in the lungs of guinea-pigs, slight fibrosis in monkeys, while no significant effect was observed in two rabbits. Amosite dust causes marked asbestosis in all three kinds of animals. Lesions occur more rapidly in guinea-pigs exposed to this dust than in those exposed to chrysotile. There is an indication that the disease is progressive in monkeys and rabbits. Similar pathology to that which occurred in a monkey exposed to chrysotile for 22 months was observed in a monkey exposed to amosite for four months. The impure crocidolite dust caused severe disease in guinea-pigs, and the rate of respiratory infection among animals exposed to this dust was more marked than with the other types. It is possible that this may be due to the high quartz content of the dust.
>
> "Finally, asbestos bodies could be demonstrated in the lungs of animals exposed to all three types of asbestos dust. These were scanty in the animals exposed to chrysotile and usually segmented. Only occasional fibers were observed. In contrast to this, the asbestos bodies in the animals that were dusted with amosite were plentiful, and segmentation was rare: fibres were extremely numerous and far outnumbered the bodies."

Following further investigation, Dr.Wagner offered an explanation for this observation at a medical symposium in 1965:

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"A method of producing asbestos dust clouds has been devised and an animal inhalation experiment carried out to test it .... The elimination rate of Rhodesian chrysotile has been found to be three times greater than that of the amosite and crocidolite, which suggests an explanation for the previously observed reduced fibrogenicity of this dust. The reason for the difference in the elimination rate remains to be determined."

COMMERCIAL ASBESTOS CONTAINS OTHER MATERIALS

Asbestos ore and refined asbestos fiber contain mineral impurities, trace elements, and trace quantitites of organics, which vary from type to type and from mine to mine. In transit the ore may pick up additional trace organic impurities.

These trace materials are also the subjects of medical study to see if they may have a role in any of the health effects observed in animals. Trace impurities of nickel, chromium and manganese for example, were found by Dr. L. J. Cralley and associates in samples of chrysotile used in the asbestos textile industry. Other impurities in commercial asbestos fiber include iron, aluminum, calcium, sodium and potassium.

WORLD ASBESTOS BANK

Much scientific research has focused on studying the varying biological effects of different types of asbestos and on developing techniques for identifying asbestos fibers of unknown origin. In 1967 a "World Asbestos Bank" was established in Johannesburg,

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South Africa, under the direction of the British Medical Research Council. The purpose of the "bank" is to provide standardized samples of asbestos from regions all over the world to be supplied to medical researchers for chemical, physical and biological investigation and for comparision purposes in clinical studies.

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T A B L E

CHARACTERISTICS OF MAJOR COMMERCIAL TYPES OF ASBESTOS

NAME	Chrysotile	Crocidolite	Amosite
CLASS	Serpentine	Amphibole	Amphibole
COLOR	White	Blue	Brown
CHEMICAL COMPOSITION	Hydrous Magnesium Silicate	Ferrous Sodium Silicate	Ferrous Magnesium Silicate
SURFACE COMPSITION	Magnesium Hydroxide	Silica	Silica
ELECTRICAL CHARGE	Positive	Negative	Negative
REACTION TO ACID	Susceptible	Resistant	Resistant
TEXTURE	Flexible	Medium Flexibility	Brittle

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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.

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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.

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 diagnois 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 fibers 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.

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

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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 MEDICINE

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.

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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January 15, 1968

INTERIM POSITION STATEMENT

ASBESTOS AND HEALTH

March 3, 1967

(NOTE: The following deals with many more items than are expected to arise at any given meeting or press conference. However, each of them has been in the news during the past year.)

ON GENERAL QUESTION OF HEALTH HAZARDS FROM ASBESTOS

We recognize that questions about asbestos and health risks have been raised to which answers should be found. But the problems are complex and offer no quick answer -- any more than there is a quick easy answer to the cause and cure of cancer.

Johns-Manville is undertaking directly, or participating in, research programs directly bearing on these health matters.

Johns-Manville is a contributing member of the Asbestos Research Council, with headquarters in England. The Council conducts research on asbestos and health questions in laboratories and research institutions all over the world. We are also co-sponsors of The Institute of Occupational and Environmental Health which recently was formed in Canada, where 90 percent of our asbestos is mined. The Institute's research which is primarily concerned with asbestos, is now getting under way under direction of a Scientific Advisory Committee. We also cooperate with the United States Public

Health Service and with other agencies and investigators on health problems.

In addition studies on the physical properties of asbestos, as they relate to health, are being conducted in Johns-Manville's own research facilities and through projects with other research institutions.

Industry has long recognized risks entailed in excessive exposure to asbestos dust and has introduced protective measures to reduce these risks, which were resulting primarily in the occupational disease of asbestosis. If there are other health hazards associated with asbestos, Johns-Manville wants to know about them so that appropriate steps can be taken to cope with them.

ON ASBESTOS AND LUNG CANCER

As we all know, the increase in lung cancer cases in recent years has been subject of many studies and theories, and research on this problem continues. Just a couple weeks ago, President Johnson called upon the Health, Education and Welfare Secretary to name a special task force on this problem. Some studies suggest that risk of lung cancer is increased through certain industrial exposures, including exposure to asbestos, and we agree that a better understanding of these possibilities is needed, and that all such risks should be reduced. Certainly, however, the basic cause of

cancer remains unclear and certainly goes far beyond exposure to any single industrial product.

ON MESOTHELIOMA

This is considered a very rare disease and apparently nobody knows very much about it, including me. Some studies have indicated that this rare tumor may be associated with certain types of asbestos, but currently the great need is to find out more about it. We are cooperating in some projects that I hope will bring more knowledge.

ON RISKS TO THE GENERAL PUBLIC

There has been some suggestions that segments of the general public may be exposed to asbestos in the aire, but there is a dearth of factual data to support this. U. S. Surgeon General Stewart in running through a list of many substances that may be detectable in the aire, including asbestos, said that further investigation is needed to determine whether there are any publice health hazards. In these days, when everything in the air, water and even the food we eat is under scrutiny, it is not surprising that asbestos is among the subjects. And we support such investigations.

Although we have seen postulations about significant amounts of asbestos getting into the air from, say, brake linings, we have seen no evidence that this is so. Our own tests on asbestos

brake linings show that only about one percent of the dust generated from repeated application of auto brakes consists of asbestos fiber. These tests are being continued and extended to other asbestos products.

ON "ASBESTOS BODIES" FOUND IN LUNGS OF CITY DWELLERS

One recent report on post mortem studies emphasized that the subjects did not die of any respiratory disease nor did the presence of so-called "asbestos bodies" in the lungs of some of them appear to have any effect. There is much medical debate over whether the term "asbestos body" should be used at all, because some experts estimate that as many as 32 different substances ranging from carpet fibers to whiskers from an electric shaver, can result in what are now loosely called "asbestos bodies" -- even though there may be no asbestos involved.

ON RISKS TO ASBESTOS WORKERS

Naturally we do not consider it advisable to inhale quantities of any foreign substances including asbestos. We control dust levels in our plants and mines to protect our employees from this kind of exposure. Some reports tend to talk about so-called "asbestos workers," in the insulating and building trades. These people however work with a variety of different materials which may or may not include asbestos. They are exposed to various types of dust. Studies are going

forward to learn more about these workers and their health.

ON SEPTEMBER 10, 1966 - CHEMICAL WEEK ARTICLE (ATTACHED)

The prompt published refutation by Johns-Manville as well as by the United States Public Health Service, of the misstatements in that article apparently set the facts straight. I refer you to those statements in CHEMICAL WEEK of October 8. There has been nothing further head from this.

ON DIVISION OF OCCUPATIONAL HEALTH NEWS RELEASES (ATTACHED)

We have seen only the press summary of this study. We know the workers were not Johns-Manville employees. But we do not know the time period covered, we do not know the population studied, nor do we know what protective measures, if any, were instituted for these workers. The news release did say that the exposures probably occurred years ago prior to present-day protective measures. Also the statement stressed the need for additional information concerning questions raised in this survey.

ON AIR AND WATER POLLUTION

Every industrial operation produces wastes and Johns-Manville is no exception. In our many installations we have introduced practices and devices to help bring our waste disposal under control. However, to be perfectly

frank, like other companies we probably could do much more. We are now in the process of examining our operations to determine what further steps may be advisable and feasible in the further clean-up of air and water around our installations. To that end, we established, last month, a new Department of Environmental Control which will direct and coordinate all activities necessary to improve environmental conditions within all Johns-Manville operating facilities and their surrounding areas. This will include water pollution, air pollution, industrial hygiene, accident prevention engineering, and product toxicology.

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