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UNION CARBIDE CORPORATION
Nuclear Division

New York, N. Y.

PLAINTIFF'S EXHIBIT
UC-861

M E M O R A N D U M

January 12, 1965

To: Messrs. T. Dougherty
R. A. Miller
R. Stobaeus
T. R. van Fleet

cc: Messrs. K. W. Lentz
A. E. Pufahl

G. S. Jordan
H. F. Reichard
N. J. Setter
R. G. Woolery

J. A. Riddle

Dr. C. U. Dernehl

Subject: ASBESTOS TOXICOLOGY REPORT

Gentlemen:

Recently several reports were given at technical meetings and summaries of them carried by the national wire services concerning possible carcinogenic properties of asbestos. Some of you may have received questions from your customers on this subject.

In order to counteract any serious problems or worries before they get out of hand, we have asked Dr. C. U. Dernehl, Director of Toxicology, Union Carbide Corporation, to formulate a statement for us. A copy of his statement is enclosed. Additional copies can be obtained from me or you may make your own copies if you wish to pass them on to interested customers. You will note that, in essence, the report states that good housekeeping -- such as would be required in any dust-producing operation -- should be sufficient to prevent any problem with asbestosis. You will also note that he mentions use in a wet system -- which certainly applies to the paper mill -- and a pellet form -- one of the strong points of our asbestos -- as additional means of minimizing any potential problem with the product.

Further, other asbestos producers and those acquainted with the subject feel that the original data upon which the cancer-producing report was based did not take into account any outside influences, such as smoking or corrosive atmospheres, which also might produce cancer. Here, it should be noted that much asbestos usage considered in the technical papers is in conjunction with tar and pitch compounds which are known to contain carcinogenic materials.

A03133

You should have this statement available for any questions which might arise from your customers. If appropriate in your judgment, perhaps it should be discussed with certain customers who have not yet raised the subject. I do not feel we should make a big issue of it thereby drawing unnecessary attention to the subject since the conclusions are still questionable.

If you have any questions, please discuss them with me.

Very truly yours,

Thomas J. Hall

T.J.Hall/dk

enc.

A03134

UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

ASBESTOS TOXICOLOGY REPORT

It has been known for many years that some persons working in asbestos production were prone to develop a disabling lung disease. In time, this condition became known as asbestosis and was related to exposure to high concentrations of asbestos dust. With further experience, it was found that men could work with asbestos without development of lung disease if dust concentrations were kept below a certain level. It is now generally accepted that a man can work a 40-hour week for a lifetime without developing asbestosis if the asbestos dust particle count is kept at or below 5 million particles per cubic foot of air. This dust concentration of 5 million particles per cubic foot of air is the Threshold Limit Value for asbestos, and no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, despite large-scale utilization (now approaching one million tons per year in the U.S.A.). This concentration of dust is generally not visible in the average work area unless a beam of light causing a Tyndall effect is present. Usually the dust concentration must be from 8-10 million particles per cubic foot before its presence is visible in average lighting conditions.

Several years ago, it was reported that there was an increase in the incidence of cancerous tumors, especially of the lung, associated with asbestosis. Recently there have been reports of some cancers occurring in individuals exposed to asbestos dust, but who have not developed clinical asbestosis. It is believed by most authorities that these cases have been associated with exposures significantly exceeding the Threshold Limit Value. A major manufacturer of asbestos products who also mines asbestos has not been able to show an increase in cancerous growths in men working where dust concentrations were maintained at the Threshold Limit Value.

Control of asbestos dust exposure is therefore necessary. The control methods are the standard ones applicable to a variety of dusty operations. They include closed flow systems, wet processes where possible, and adequate exhaust ventilation where openings in the system are necessary. Pelletizing is sometimes used to improve the handling characteristics of otherwise dusty materials. Where satisfactory containment to stay within the Threshold Limit Value is impractical or impossible, efficient and reliable respirators are available for the protection of the employee. A program of environmental monitoring is highly desirable to determine that Threshold Limit Values are not being exceeded. In paper manufacturing, it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the pulp slurry. Concentrations should also be determined where dusting occurs in

A03135

finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

Pre-employment and periodic physical examinations of workers are desirable. These should include chest X-rays to insure that the worker has no chest condition prior to work with asbestos and to determine that no lung changes are resulting from work with asbestos.

It is believed that the addition of asbestos at the proposed levels during the manufacture of paper products would be harmless to the consumer. Total dusting would have to be well in excess of any levels acceptable to the consumer for the asbestos concentration to approach the Threshold Limit Value.

In conclusion, while asbestos dust in excess of the Threshold Limit Value is potentially harmful, as are many other dusts encountered in industry, it is as readily controlled as other such dusts and it can be used safely with appropriate precautions.

Carl U. Dernehl, M.D.
Director of Toxicology

K. S. Lane, M.D.
Assistant Director of Toxicology

A03131

INTERNAL CORRESPONDENCE

UNION CARBIDE CORPORATION • 270 PARK AVENUE, NEW YORK, NEW YORK 10017

(Name) Messrs: C. Benjamin
T. F. Frangos
B. E. Godard
J. L. Myers
J. A. Riddle
N. J. Setter
J. T. Sinclair
J. R. Stickney
W. S. Young

Date: April 3, 1969

Originating Dept.: Medical Department

Answering letter date:

Subject: Asbestos

RECEIVED
APR 7 1969
U.C.C. CHEM. & PLASTICS

Gentlemen:

Both because of changes in regulations and availability of data developed after the issuance of our report in 1964, Dr. Dernehl and I have revised the asbestos memorandum. A copy of the revision is enclosed.

The major changes are the decrease in the Threshold Limit Value from 5 million particles per cubic foot of air to 2 million particles per cubic foot of air. (There is also a provision for another method of counting but it does not appear applicable to our short fiber asbestos.) We briefly discuss mesotheliomas, but data is too scanty as yet for a definite policy to be established. It is worth mentioning that the American Conference of Governmental Industrial Hygienists considered in 1968 a requirement that airline respirators be required for all contact with crocidolite asbestos. The resolution did not pass, but may come up again in future meetings.

Any questions or comments will be welcome.

Very truly yours,

K. S. Lane, M. D.
Assistant Medical Director

KSL:lk
Enclosure

A03137

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ASBESTOS TOXICOLOGY REPORT

It has been known for years that some persons working in asbestos production were prone to develop a disabling lung disease. In time, this condition became known as asbestosis and was related to exposure to high concentrations of asbestos dust. With further experience, it was found that men could work with asbestos without development of lung disease if dust concentrations were kept below a certain level.

It has been generally accepted that a worker will not develop asbestosis if he is exposed to no more than 5 million particles per cubic foot of air, even if this exposure continues for his entire working lifetime. Although no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, the ACGIH (which sets the threshold limit value (TLV) in the U. S. A.) has indicated they intend to lower the TLV for asbestos to 2 million particles per cubic foot in an effort to increase the safety factor incorporated in the limit. The U. S. Department of Labor has already issued a regulation under the Walsh-Healy Act placing the TLV for asbestos at 2 million particles per cubic foot for public contracts in which they have jurisdiction. This concentration of dust is generally not visible in the average work area unless a

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beam of light causing a Tyndall effect is present. Usually the dust concentration must be from 8-10 million particles per cubic foot (MPPCF) before its presence it visible in average lighting conditions.

Several years ago, it was reported that there was an increase in the incidence of cancerous tumors, especially of the lung, associated with asbestosis. Recently there have been reports of some cancers occurring in individuals exposed to asbestos dust, but who have not developed clinical asbestosis. It is believed by most authorities that these cases have been associated with exposures significantly exceeding the Threshold Limit Value.

A type of cancer named mesothelioma has been noted to be associated with asbestos exposure in recent years. These tumors, while rather few in number to date, may occur in individuals with histories of only slight exposures, and that as much as twenty to forty years earlier. There is considerable evidence that crocidolite is most frequently associated with mesotheliomas. From the data available it appears that the TLV of 5 MPPCF is not low enough to protect against mesothelioma, and it is quite possible that 2 MPPCF is not, either. Research on the problem continues.

Control of asbestos dust exposure is therefore necessary. The control methods are the standard ones applicable to a variety of dusty operations.They include closed flow systems,

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wet processes where possible, and adequate exhaust ventilation where openings in the system are necessary. Pelletizing is sometimes used to improve the handling characteristics of otherwise dusty materials. Where satisfactory containment to stay within the Threshold Limit Value is impractical or impossible, efficient and reliable respirators are available for the protection of the employee. A program of environmental monitoring is highly desirable to determine that Threshold Limit Values are not being exceeded. In paper manufacturing, it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the pulp slurry. Concentrations should also be determined where dusting occurs in finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

Pre-employment and periodic physical examination of workers are desirable. These should include chest X-rays to insure that the worker has no chest condition prior to work with asbestos and to determine that no lung changes are resulting from work with asbestos.

It is believed that the addition of asbestos at the proposed levels during the manufacture of paper products would be harmless to the consumer. Total dusting would

A03140

have to be well in excess of any levels acceptable to the consumer for the asbestos concentrations to approach the Threshold Limit Value.

In conclusion, while asbestos dust in excess of the Threshold Limit Value is potentially harmful, as are many other dusts encountered in industry, it is as readily controlled as other such dusts and it can be used safely with appropriate precautions.

Industrial Medicine And
Toxicology Department
Union Carbide Corporation

A03141

MEMORANDUM

TO: Messrs. T. Dougherty
R. A. Miller
R. W. Stobaeus
B. K. Barton
J. E. Skvarla
N. J. Setter
R. T. Larkin

CC: L. S. O'Rourke
T. J. Hall
H. F. Reichard/R. G. Woolery
J. A. Riddle
J. Derbecker
P. R. Chestor.
T. F. Frangos

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Shifters ☒
A. A. Andrade ☐
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DATE: September 9, 1966

SUBJECT: Asbestos - Toxicology

RECEIVED
SEP 12 1966
U.C.C. - MNG. & METALS DIV.
KING CITY, CALIF.

Gentlemen:

Attached are "tear sheets" from some of the most recent publicity in respect to the subject. The one article appeared in the September 10 issue of CHEMICAL WEEK; the other was passed along to us by Peter Cheston, and appeared in the LONDON SUNDAY TIMES of August 14.

There is no doubt this kind of publicity will persist, and it is important that its inapplicability to our products and our applications not be missed by our customers and prospects. You have some positive positions you can and should take with your customers:

1. It is important that you continue to use Dr. Dernehl's "Asbestos Toxicology Report" as well as the statements made by the Food and Drug Administration (Department of Health, Education and Welfare). I am attaching copies of each; if your file supply of these is depleted, you can either run off copies or get additional from us.

2. In the CHEMICAL WEEK article, if we look at the summary of "sources of airborne asbestos", we see that, to our knowledge, our products now are used only in modest amounts in ceiling and floor tiles, and here in relatively low concentrations. Further, these are applications employing particularly good resin binders, making the loss of asbestos to the air from such compositions appear highly unlikely.

A03142

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3. You will recall (my memo March 26) that there has been medical literature reference to the association between cancer and polycyclic aromatic organic compounds found with certain sources of asbestos -- among them jute oils from sacking materials, and 3,4 benzo(a) pyrene.

   Union Carbide uses no jute bags.

   Analytical tests have established the absence of organic material with Union Carbide asbestos. Some time next week, we expect microanalyses to show specifically no detection of polycyclic aromatic compounds with Union Carbide asbestos of our different grades.

4. Please note the primary concern in these publications deals with "airborne asbestos" - and Dr. Dernehl has stated clearly that "while asbestos dust in excess of the Threshold Limit Value is potentially harmful, as are many other dusts encountered in industry, it is as readily controlled as other dusts and it can be used safely with appropriate precautions". We should take the positive position, important to our customers, that Union Carbide produces and supplies this commodity in pelletized form, a major step in assisting the user to control his own dust hazards. We feel certain this factor has been a prominent one in the decision of certain of our floor tile customers to shift toward use of Union Carbide product.

Very truly yours,

A.E.Pufahl:dk

attach.

AU3143

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UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

ASBESTOS TOXICOLOGY REPORT

It has been known for many years that some persons working in asbestos production were prone to develop a disabling lung disease. In time, this condition became known as asbestosis and was related to exposure to high concentrations of asbestos dust. With further experience, it was found that men could work with asbestos without development of lung disease if dust concentrations were kept below a certain level. It is now generally accepted that a man can work a 40-hour week for a lifetime without developing asbestosis if the asbestos dust particle count is kept at or below 5 million particles per cubic foot of air. This dust concentration of 5 million particles per cubic foot of air is the Threshold Limit Value for asbestos, and no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, despite large-scale utilization (now approaching one million tons per year in the U.S.A.). This concentration of dust is generally not visible in the average work area unless a beam of light causing a Tyndall effect is present. Usually the dust concentration must be from 8-10 million particles per cubic foot before its presence is visible in average lighting conditions.

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Pre-employment and periodic physical examinations of workers are desirable. These should include chest X-rays to insure that the worker has no chest condition prior to work with asbestos and to determine that no lung changes are resulting from work with asbestos.

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Carl U. Dernehl, M. D.
Director of Toxicology

K. S. Lane, M. D.
Assistant Director of Toxicology

A03145

LONDON

Asbestos recognised as cancer risk

By Dr Alfred Byrne

REGULATIONS which acknowledge that occupational exposure to asbestos is causing the most important industrial cancer of our time will be introduced next week by Miss Margaret Herbison, Minister of Social Security.

From August 22 the tumour known as mesothelioma will be included as a "prescribed disease," so that asbestos workers who contract it as a result of their occupation after a certain date will be eligible for industrial benefit. Mesothelioma is an unusual tumour of the pleura—covering the lung—and of similar tissue lining the abdominal cavity, and is invariably fatal. Several steps are being taken towards discovering the full effects of this recently-recognised disease so that measures to prevent it can be devised.

A register of all past and present cases occurring in Britain has been set up by the Medical Research Council's Pneumoconiosis Research Unit, directed by Dr. J. C. Gilson, in Cardiff. They have added 70 new cases to their original nucleus of 120 since the Sunday Times broke the news of this epidemic on October 21, 1965. One hospital in London and another in Belfast are each admitting an average of one new case a month.

An average of 40 years usually elapses between exposure to asbestos and the appearance of the growth. Exposure for only two or three months may cause the cancer. Living near an asbestos works predisposes to mesothelioma, and relatives of asbestos workers can also get it through inhaling asbestos fibres given off the clothing of their menfolk.

Such patients were not working with asbestos, so they will not be eligible for compensation under the Industrial Injuries Act of 1947. Incredibly, perhaps, there are also other mesothelioma victims who are not eligible under the new regulation because they worked for a short time in the industry only before the new Act came into force.

There are three types of asbestos used commercially—chrysotile, crocidolite and amosite—whose possible hazards are now being assessed in the laboratory and the field. With Dr Gilson as chairman, the International Union Against Cancer is arranging mesothelioma surveys in areas where only one type of fibre is produced. Studies in South Africa have already shown that the disease is more common in the neighbourhood of mines producing crocidolite than amosite. To complete the picture the committee are anxious to see a similar study performed in Canada in relation to mines producing chrysotile.

Pathologists in British hospitals are also going back through their records to see if mesothelioma is a "new" disease associated with the commercial use of asbestos, and checking if it is peculiarly related to certain districts. They are also studying the incidence of asbestos particles in lungs examined post mortem. In cities of the U.S, South Africa and Britain the lungs of middle-aged and older people have been found to contain asbestos bodies in from 5 to 56 per cent. of cases. But the medical significance of this, if any, remains to be decided.

Advised by a committee of experts, the Ministry of Labour is drawing up a new code of regulations designed to give persons working with asbestos more protection than they have had from the general factory regulations. Asbestos is now used to make gutters, roofing, tiles, brake-linings and numerous other things not envisaged when the risk of asbestosis was first realised.

The official proposals will therefore include several occupations to which not enough thought is given at present. Permissible standards of dustiness will presumably be proposed for workers exposed to special risk, such as those in the textile industry and men engaged in lagging hot pipes. It is hoped that the first official proposals will be made known by the end of this year.

AU3141

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Taking Giant Steps

Two chemical process companies took giant steps toward diversifying into the oceanography field last week, and two paper companies with combined sales of nearly $1 billion/year reached a tentative agreement to merge.

(1) Bendix Corp. (Detroit) expanded its oceanic activities by acquiring for an undisclosed amount of stock Marine Advisers (La Jolla, Calif.), producer of oceanographic instruments for petroleum and utility companies, state and federal agencies, and firms engaged in scientific programs.

(2) Fluor Corp. (Los Angeles) and B. L. McFarland and Associates (Fort Worth and Midland, Tex.), a group of five companies involved in offshore and onshore drilling operations, have agreed to merge, subject to stockholders' approval. The McFarland group operates five offshore drilling rigs in the Gulf of Mexico.

(3) A tentative agreement to merge has been reached by U.S. Plywood Corp. (New York) and Champion Papers, Inc. (Hamilton, O.). It is subject to both directors' and stockholders' approval. The corporate identities of both companies will be preserved.

Reducing Gas Rates

The Federal Power Commission has ordered El Paso Natural Gas Co. and Transwestern Pipeline Co. to reduce by $17 million/year the price of natural gas in the southern California market.

The rate cut stems from the July 26 decision in which FPC turned down the application of Gulf Pacific Pipeline Co. (a Tenneco subsidiary) to supply gas to the Los Angeles area (*CW, Aug. 6, p. 20*). Gulf Pacific last week filed for a rehearing.

El Paso and Transwestern were told they would have to lower their rates to reflect the lower costs resulting from the bigger deliveries possible in the expanded system. At the same time, FPC said it would conduct further proceedings to decide if customers should get additional benefits resulting from more liberal depreciation allowances.

FPC has given the companies 45 days to show cause why the reduction should not take place.

Sources of airborne asbestos

Asbestos-lined ducts used in centrally air-conditioned buildings.
Asbestos ducts and insulation in home central-heating plants.
Motor vehicle brake linings and clutch plates.
Auto undercoatings.
Asbestos ceiling and floor tiles.
Asbestos shingles and sidings.
Construction and demolition
Fitting, cutting, and removing asbestos-filled wallboards and floorings, piping and insulation.
Incineration of asbestos-filled scrap.
Improperly filtered effluent from asbestos processing plants.

Asbestos: Awaiting 'Trial'

The asbestos industry—whose end products are valued at more than $500 million/year—may be in for a shake-up. It could come in the form of federal legislation limiting the use of asbestos, because asbestos has been accused—though not yet "convicted"—as a significant health hazard. Probable contender for asbestos markets: plastics.

Recent studies have convinced U.S. Public Health Service specialists and other medical authorities that about 40% of all Americans have mild, chronic cases of asbestosis, even though most of them never worked directly with asbestos.

Unlike other airborne dust particles, asbestos fibers have the ability—almost as much as activated carbon—to absorb polycyclic hydrocarbons and arsenicals. Furthermore, says USPHS, in the past 30 years the asbestos-related cancer rate has increased sixfold.

The Inferences: While the average asbestos worker is well protected, the man on the street is not. The 3x1-micron asbestos fibers in his lungs can come from a variety of sources (*table, above*).

And medical experts say there's no way to assess hydrocarbon content in those lung deposits.

American Cancer Society researchers feel certain there is a synergistic relationship among airborne asbestos, smoking and lung cancer. They reason that the nondegradable, hydrocarbon-soaked fibers may well be a constant source of lung irritation.

PHS officials think it may take them up to five years to establish asbestos' true role as an air pollutant. However, Congress may act before the research is finished. Says Representative Robert Watkins (R., Pa.): "We've seen enough evidence already. Asbestos will never get a clean bill of health. With just a little more data we'll move for controls and strict ones."

Some form of asbestos control is in the offing, public health officials are certain, if only part of a larger clean-ambient-air program. However, there is the danger that Congress may enact rigorous controls on the quantity of asbestos that could be used.

In that case both Canada and U.S. asbestos products manufacturers would be hard hit. Of the five forms of asbestos mined today, chrysotile asbestos holds the predominant market position because of its insulating and processing qualities. Canada produces more than 80% of the chrysotile asbestos used in the U.S. In both countries, a number of serious dislocations would occur.

At present, there is no known material that could fill all of asbestos' strategic roles. On the other hand, should federal controls merely call for higher standards for binders and shieldings, that would spark a rise of new products, with plastics taking the lead.

Reason, say industry spokesmen, present polymer technology could easily turn up products to replace asbestos in most end-uses.

AU3147

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ACL Doc 16072 · Page 15 of 31 asbestosclaims.law/library/16072/15

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
FOOD AND DRUG ADMINISTRATION
WASHINGTON 25, D.C. 20204

December 6, 1963

Mr. George T. Scriba
Union Carbide Corporation
270 Park Avenue
New York, New York 10017

Dear Mr. Scriba:

Reference is made to your letter of October 31, 1963, relative to the status of an asbestos fiber as a component of paper and paperboard.

We concur that when used consistent with the principles of good manufacturing practice asbestos as an inert filler in paper and paperboard does not have food additive status. Therefore, there is no necessity for a regulation to prescribe the use of such asbestos fiber as an inert filler in such paper and paperboard.

Sincerely yours,

Frederick A. Cassidy

Frederick A. Cassidy
Food and Drug Officer

A03148

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Our Law Department advises us that the attached exchange of letters with the Food and Drug Administration means that FDA is in agreement with us that the use of asbestos fiber as a component of paper and paperboard used in contact with food is safe and is in compliance with the Food and Drug Act and that no specific regulation under the Food Additives Amendment is necessary. Our letter to FDA is dated October 31, 1963. Their reply is dated December 6, 1963. The correspondence is between Mr. Scriba of our Law Department and Mr. Cassidy of F.D.A.

AU3141

UNION CARBIDE CORPORATION
270 PARK AVENUE
NEW YORK, N. Y. 10017

LAW DEPARTMENT

October 31, 1963

Food and Drug Administration
Washington 25, D.C.

Re: Asbestos Fiber

Gentlemen:

(1) This is to inquire whether you are in agreement with us that the use of asbestos fiber as an integral component of paper and paperboard does not result, and may not reasonably be expected to result, directly or indirectly, in its becoming a component or otherwise affecting the characteristics of the food when the paper or paperboard is employed in contact with food.

(2) If not, whether you are in agreement with us that this use of asbestos fiber is generally recognized as safe among experts qualified by scientific training and experience to evaluate its safety.

(3) If not, we ask you to file this letter as a petition for a regulation under Section 409 of the Federal Food, Drug and Cosmetic Act stating that this use of asbestos fiber is safe. We propose to sell asbestos fiber for this use. Responsible paper manufacturers tell us that it improves the quality of paper and paperboard for certain food contact use. We base this petition on the generally known physical characteristics of asbestos fiber. While we write in terms of "asbestos fiber" without limitation in view of your presumed interest in a broad regulation, our company's direct present interest lies in chrysotile asbestos (a magnesium silicate). We attach a table entitled "Solubility and Dissociation Data for Chrysotile in Water" from The Journal of Physical Chemistry, Vol. LX (1956) page 1220, and our summary of "Properties of Chrysotile Asbestos Fiber". We respectfully propose the following regulation:

¶121.__ Asbestos Fiber.
Asbestos fiber may be safely used as a component of paper and paperboard intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding food.

Very truly yours,
UNION CARBIDE CORPORATION

By_____
George T. Scriba

GTS:R
enc.

A03450

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K. West ☐
G. Vessels ☐
A. A. Andrade ☐
File JAR ☐

RECEIVED
MAR 28 1966
U.C.C. - ING. & METALS DIV.

MEMORANDUM

TO: Messrs. T. Dougherty
R. A. Miller
R. W. Stobaeus
B. K. Barton
T. R. van Fleet
N. J. Setter
R. T. Larkin

DATE: March 22, 1966

CC: L. S. O'Rourke
T. J. Hall
H. F. Reichard/R. G. Woolery
J. A. Riddle ✓
J. Derbecker
P. R. Cheston
T. F. Frangos

SUBJECT: Asbestos - Toxicology

Gentlemen:

Early in March the "New York Times" and the "Herald Tribune", reporting the establishment of a new environmental health laboratory at Mt. Sinai Hospital (New York City), revived some publicity (copy attached) in regard to Asbestos dust as a health hazard. We understand that a few newspapers in other cities picked it up.

"Out of context" reporting leads to erroneous conclusions, and this is no exception. Nevertheless, we should reckon that such a commentary will recur, and all of us should use the tool we now have at our disposal to make certain our customers are acquainted with the facts:

1. You have copies of Dr. Dernehl's "Asbestos Toxicology Report." Additional copies are enclosed. Use these, and call particular attention to Dr. Dernehl's statements in regard to "Threshold Limit Value" for asbestos. Control of asbestos dust exposure is necessary, as is control of exposure to any of a variety of dusty operations.

2. Union Carbide pellets offer a clear-cut means of handling asbestos under exceptionally low dust conditions.

3. No work yet conducted or published presents, nor professes to present, incontrovertible proof of a relationship between cancer and asbestos. Some publications have referred to the association of deleterious organic compounds, among them jute oils from jute sacking material, and 3,4 benzo(a) pyrene. We do not use jute bags. Further, we are

A03151

analyzing random samples of our product, and expect shortly to prove the absence of any polycyclic aromatics.

Your pelleted asbestos affords customers the best means of avoiding dust hazards. Make this clear.

Very truly yours,

A.E.Pufahl/dh

Enclosures

A03152

ress in painting the ...

Asbestos Dust Called a Hazard To at Least One-Fourth of U.S.

By JANE E. BRODY

Asbestos dust, which has already been connected with the development of fatal cancer in one-half of asbestos workers, may be a potential health hazard for one-quarter of the population or more, it was reported yesterday.

This preliminary finding was described by Dr. Irving J. Selikoff in announcing the establishment of an environmental health laboratory at Mount Sinai Hospital. The laboratory will further investigate the dangers to man of asbestos and other environmental contaminants.

Dr. Selikoff said the link between cancer and asbestos had led him to suspect that other mineral dusts that contaminate both urban and rural air might create medical hazards for the public.

The new laboratory will be headed by Dr. Selikoff who, with Dr. Jacob Churg, found that asbestos workers eventually showed to seven times the normal death rate from lung cancer and three times the normal death rate from cancer of the stomach, colon and rectum.

Other Workers Affected

Dr. Selikoff noted that the dangers of exposure to asbestos dust were not limited to those who work directly with this ubiquitous insulator and filler material. The dangers, he said, extend to workers in "contiguous trades," such as other construction workers and their families.

According to the findings of three recent limited studies, the dangers might extend to the general population. The studies, which involved autopsies on 1,100 persons in three cities, showed that 25 per cent of the people had asbestos lodged in their lungs.

Dr. Selikoff explained that the studies had used a "crude technique" that disclosed only those asbestos fibers that had become coated by an iron-rich material while lodged in the lungs. A more refined technique now shows that many persons harbor noncoated asbestos fibers as well, he said.

New Study Started

Dr. Selikoff and his colleagues at the new laboratory have started a three-year study in which they will:

¶Examine, with the deceased's family's approval, the lung tissue of the from 3,000 to 4,000 persons expected to die in the next two years at Mount Sinai, Elmhurst Hospital and Veterans Hospital in the Bronx. The doctors will look for uncoated as well as coated asbestos fibers in the tissues.

¶Look for correlations between the causes of death and the presence of asbestos fibers in lung tissue.

¶Determine the occupational history of the deceased and their relatives and other pertinent background information.

Asbestos is a fibrous mineral highly valued for its noncorrosive and long-wearing properties. In addition to its common use as a fireproof material, Dr. Selikoff said, asbestos makes up about 50 per cent of asphalt tile and is used in dental cement, brake linings, plastics, beer filters, gas masks and paper. Until last year, some schools used asbestos dust instead of sand for children to play in.

Study Links Asbestos To Cancer

By Earl Ubell
Science Editor

Scientists have known for a long time that asbestos was bad for your lungs. Now a study of New York City workers, both roofers and insulation blowers, reveals that exposure to the mineral sends lung-cancer death rates skyrocketing.

The figures—gathered by doctors at Mount Sinai Hospital—show that such workers have eight times the lung-cancer death rate as would be expected in a non-exposed population.

More suprisingly, the studies reveal that such workers run four times the risk of getting cancer in other parts of the body, with cancer of the colon particularly singled out. For all other diseases, the insulation workers have the same death rate as the rest of the population.

These findings were emphasized yesterday by Dr. Irving J. Selikoff, head of Mt. Sinai's Division of Environmental Medicine, on the occasion of the establishment of an environmental health laboratory in the hospital. The laboratory has received grants totaling $324,000 from the United States Public Health Service and the New York City Health Research Council.

Dr. Selikoff also pointed out that cigarette smoking seems to heighten the effects of the asbestos. Among 130 men exposed to asbestos 20 years or more who were nonsmokers, he found one lung-cancer death among 310 smokers, 21 such deaths.

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UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

ASBESTOS TOXICOLOGY REPORT

It has been known for many years that some persons working in asbestos production were prone to develop a disabling lung disease. In time, this condition became known as asbestosis and was related to exposure to high concentrations of asbestos dust. With further experience, it was found that men could work with asbestos without development of lung disease if dust concentrations were kept below a certain level. It is now generally accepted that a man can work a 40-hour week for a lifetime without developing asbestosis if the asbestos dust particle count is kept at or below 5 million particles per cubic foot of air. This dust concentration of 5 million particles per cubic foot of air is the Threshold Limit Value for asbestos, and no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, despite large-scale utilization (now approaching one million tons per year in the U.S.A.). This concentration of dust is generally not visible in the average work area unless a beam of light causing a Tyndall effect is present. Usually the dust concentration must be from 8-10 million particles per cubic foot before its presence is visible in average lighting conditions.

Several years ago, it was reported that there was an increase in the incidence of cancerous tumors, especially of the lung, associated with asbestosis. Recently there have been reports of some cancers occurring in individuals exposed to asbestos dust, but who have not developed clinical asbestosis. It is believed by most authorities that these cases have been associated with exposures significantly exceeding the Threshold Limit Value. A major manufacturer of asbestos products who also mines asbestos has not been able to show an increase in cancerous growths in men working where dust concentrations were maintained at the Threshold Limit Value.

Control of asbestos dust exposure is therefore necessary. The control methods are the standard ones applicable to a variety of dusty operations. They include closed flow systems, wet processes where possible, and adequate exhaust ventilation where openings in the system are necessary. Pelletizing is sometimes used to improve the handling characteristics of otherwise dusty materials. Where satisfactory containment to stay within the Threshold Limit Value is impractical or impossible, efficient and reliable respirators are available for the protection of the employee. A program of environmental monitoring is highly desirable to determine that Threshold Limit Values are not being exceeded. In paper manufacturing, it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the pulp slurry. Concentrations should also be determined where dusting occurs in finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

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Pre-employment and periodic physical examinations of workers are desirable. These should include chest X-rays to insure that the worker has no chest condition prior to work with asbestos and to determine that no lung changes are resulting from work with asbestos.

It is believed that the addition of asbestos at the proposed levels during the manufacture of paper products would be harmless to the consumer. Total dusting would have to be well in excess of any levels acceptable to the consumer for the asbestos concentration to approach the Threshold Limit Value.

In conclusion, while asbestos dust in excess of the Threshold Limit Value is potentially harmful, as are many other dusts encountered in industry, it is as readily controlled as other such dusts and it can be used safely with appropriate precautions.

Carl U. Dernehl, M. D.
Director of Toxicology

K. S. Lane, M. D.
Assistant Director of Toxicology

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RECEIVED
DEC 5 1967
I.F. FRANGOS

UNION CARBIDE BELGIUM N.V.

BRUXELLES 5, 30 November, 1967
149, AVENUE LOUISE

V. REF.
N. REF. 1415 /TJH/MLF

Mr. F. Dexter
Union Carbide Corporation
New York Office

Dear Frank:

As you know we have been trying to keep close to the asbestos toxicology work in the U.K. Fred Mumpton at Niagara Falls arranged for some work to be carried out on a sample and gave us a report on this. Ian Sayers took the report to the laboratory group in the U.K. which is co-ordinating this work. I am enclosing a copy of his hand written report for your information. When they come back to us for additional analytical work we will pass it on to you. There continues to be a great amount of concern about this subject and we are going to have to learn to live with the problem in the U.K. So far there has been no indication of it being passed on to the continent.

OVER

In this report Ian passes on the request for permission to publish our data and I would like your comments on this. Even if you agree we would try to find out in more detail the conditions under which this data would be presented before agreeing directly with them. Perhaps it would be better to have this sort of publication first approved by Carl Dernehl before we finally agree. Also I will ask Ian to follow directly on obtaining the spectrographic analysis method.

If you or any of the others receiving this letter have any comments I would welcome them.

Best regards,

Very truly yours,

THOMAS J. HALT

AU3151

Also is a good deal of background information which is most familiar to me but is supplied here, for your and Bob Zeh matter for discussion with Dan when he gets here.

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SUMMARY ON SAYER'S REPORT OF VISIT TO PNEUMOCONIOSIS RESEARCH UNIT 7-11-67

GAVE DR. TIMBRELL MUMPTON'S ANALYTICAL DATA.

PRU NOW SAYS THAT CHRYSOTILE FIBERS, BEING CURVED, ARE LESS LIKELY TO GO DEEP INTO LUNGS. INJECTED CHRYSOTILE DOES CAUSE CANCER IN RATS, SO THE FACT THAT IN PRACTICE IT IS LESS RESPONSIBLE FOR TUMOR PRODUCTIO IS PROBABLY DUE TO ITS GREATER ELIMINATION RATE AS WELL AS ITS GEOMETR

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INTERNAL CORRESPONDENCE

cc: REO, NT
cc: JAR
5-1-70

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RECEIVED
APR 6 - 1970
UCC - CALIDRIA
KING CITY, CA.

(Name) Mr. C. E. Metten
vision Chemicals & Plastics
cation 2770 Leonis Blvd.
Los Angeles, Calif. 90058

Date March 21, 1970

Originating Dept. Medical Department

Answering letter date

opy to bcc: M. B. VerNooy - TT
W. J. Fitzpatrick - LA
W. G. Farrell - LA
John Meyers - King City

Subject Toxicity of Calidria Asbestos

Asbestos has practically no acute toxicity regardless of its type or form. The harm associated with asbestos is from the fibrogenic properties of the inhaled dust. This usually is seen only after prolonged exposure measured in terms of 15-20 years although cases rarely will occur in less time.

Because of the rather unique structure characteristics of Calidria Asbestos, there was concern that it might be unusually fibrogenic and perhaps cause an acute asbestosis.

To test this possibility, Calidria Asbestos was injected into rats and rabbits intraperitoneally using a standard long fibre asbestos as a control. The results of this test showed Calidria Asbestos to be slightly more fibrogenic than long fibre asbestos but the difference was not so great as to suggest an unusual degree of hazard. From this I conclude that the same precautions to avoid breathing asbestos dust must be observed whether the dust be from Calidria Asbestos or from a standard long fibre form.

Some people believe there is an association between exposure to asbestos dust and the development of lung cancer and mesothelioma. There is no information regarding Calidria Asbestos in this respect as yet. It would be prudent to assume that Calidria Asbestos will behave like other asbestos in this regard.

C. U. Dernehl M.D.

C. U. Dernehl, M. D.
Associate Medical Director

CUD:dp

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Union Carbide Corporation
Mining and Metals Division
270 Park Avenue
New York, New York 10017

RECEIVED
FEB 9 1966
T. F. FRANGOS

February 8, 1966

Asbestos
Toxicology

Mr. Peter R. Cheston
Union Carbide Limited
8 Grafton Street
London, England

Dear Peter:

Your suggestion that we consider including "UK paper industry" comments in our General Sales meeting is well taken -- and I plan to review the notes with Ian Sayers.

Apropos of your letter on toxicological studies relative to asbestos -- we have reviewed the two excerpts you sent us with Dr. Carl Dernehl. He counsels that the papers "do not by any means present incontrovertible proof nor do they profess to do so." Further: "Our position should remain that in United States experience there has been no increased incidence of lung cancer when the threshold limit has not been exceeded."

From past publications, we have also noted the references to organic contaminants, with the thought that proof of absence of polycyclic aromatics in Union Carbide asbestos might be useful, we are planning some extraction studies and analyses for 3,4-benzo(a)pyrene by techniques employed at South Charleston. We will let you know the results, probably in an appropriately written statement by Dr. Dernehl.

The matter of soft papers, facial and other tissues, has been a re-curring subject with us. Primarily this is a question of skin sensitization. While the over-all statements by our Industrial Medicine and Toxicology people should suffice -- we have given thought to "patch tests," which, incidentally, cost appreciably to run. It would be meaningless to conduct such tests with paper containing UCC asbestos, since the other components of the furnish bear on the results. Hence we are considering patch tests using straight asbestos -- which, of course, would absolve only our product. The other components (including, as you know, a variety of organic compounds) of specific furnishes would have to be considered by the paper company involved. We shall let you know our plans.

Very truly yours,

A.E.Pufahl:dk

cc: H. F. Reichard
T. F. Frangos
R. F. Gray (Australia)

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VIREF.
NIREF. 1415 TJH/MLF

BRUXELLES 6, 1 August, 1967
149, AVENUE LOUISE

RECEIVED
SEP 1 1967
T.F. FRANCIS

Mr. Frank Dexter
Union Carbide Corporation
Chemicals & Plastics Division
270 Park Avenue
New York, N. Y. 10017

Re: ASBESTOS TOXICOLOGY

Dear Frank:

During a recent conference on Physics and Chemistry of Asbestos Minerals at Oxford, England, I met with representatives of the group who are coordinating an analytical program for asbestos samples. These were:

Dr. V. TIMBRELL
Medical Research Council
Pneumoconiosis Research Unit
Llandough Hospital
Penarth, Glamorgan. U K

Dr. T.G. MORRIS
M.R.C. Llandough Hospital
Penarth, Glamorgan.

This meeting was to arrange for Union Carbide's cooperation in trace element analyses of standard samples.

Dr. Mumpton, who, incidentally, gave an exceptionally good and well received paper at the meeting, is bringing the samples back to Niagara Falls and is aware of the requirements of the group for analysis. Briefly, they would like to have all possible trace elements analyzed to the highest possible degree of accuracy.

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There are two samples of chrysotile asbestos, one of amosite and, I believe, two of crocidolite. Dr. Timbrell has sizable quantities - close to one ton each of these materials - which have been "thoroughly" blended. In the case of chrysotile he also has samples of the different types from which the standard sample mix was prepared. He asked if we could possibly analyze samples of these original components in order to see if any components were present which might be used as a key to the efficiency of their mixing and blending procedures. Dr. Mumpton agreed to determine the cost of these further analyses to see if we could justify also doing some of them.

We had a lengthy discussion with Dr. Timbrell and Dr. Morris and Dr. Mumpton can fill you in on the details. I believe it is fair to say that there are certainly many questions and problems still unanswered and realistically there is not much evidence yet as to the true "danger" of using asbestos.

I expect to be in New York during the week of August 14 and would like to talk to you more about this and other asbestos subjects.

Very truly yours,

THOMAS J. HALL.

cc: Dr. C.U. Dernehl. M.D.
Mr. F. Frangos - N.Y.
Dr. F. Mumpton - Niagara Falls
Mr. L.D. Polderman - Office
Dr. A.E. Pufahl - New York
Mr. I.C. Sayers - London
Mr. R.G. Woolery - Niagara Falls

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UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

MEDICAL
DEPARTMENT

June 7, 1967

Dr. T. J. Hall
Union Carbide Europa A.A.
40, Rue Du Rhone
1211 Geneve 3
Suisse

Dear Tom:

I have reviewed the report, "Asbestos As A Health Hazard In The United Kingdom", prepared by I. C. Sayers, and in general I find that it is reasonably accurate. I do not attach very much importance to the data on the incidence of asbestosis and death from asbestosis and cancer because these are merely tabulations of events and do not take into consideration the numbers of people who were subjected to the possibility of the event occurring.

We had been interested in the possibility that the short fiber Coalinga product might have a greater hazard than the more conventional forms of asbestos because sub-micron silica has been known to cause a rapidly progressive silicosis after exceedingly brief exposure. We were concerned about whether the Coalinga material with its exceedingly fine fibril diameter might have a similar effect in causation of asbestosis. We therefore made some preliminary studies in which the material was injected into the belly cavity of guinea pigs, rats and rabbits and also was injected intratracheally by a method which distributes the asbestos throughout the lungs of rats. The materials injected were the standard fiber, a refined fiber and a long fiber obtained from Johns Manville for purposes of comparison. In the injection study the Coalinga refined fiber produced the most severe reaction in the belly cavity, whereas the

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standard fiber and the Johns Manville fiber were essentially the same and less severe. In the inhalation study in the lung the crude fibers caused a more severe lesion, the refined fiber was intermediate and the Johns Manville fiber was least reactive. The only conclusion we can draw from this crude test is that it is possible that our Coalinga product may be more hazardous to use than long fiber asbestos in that it may induce the disease, asbestosis, at an early time after exposure.

The question was raised whether the 5 million particles per cubic foot were within the Threshold Limit Value. I maintain that this value is valid insofar in terms of preventing the disease, asbestosis. There is no evidence of asbestosis occurring among people who have worked in an environment where the concentration was kept within the threshold limit value. It is probable that the 5 million particles per cubic foot will not be acceptable for the prevention of mesothelioma. I have no idea what concentration might be effective in preventing this disease and I would wonder whether even a limit of 1 million particles per cubic foot would be effective in this regard.

Finally, I would give my unquestionable support to the request of the Pneumoconiosis Research Council for trace element analysis of the standard sample of asbestos. By so doing we would develop techniques which could be applied to our product from King City and which would be useful in making comparisons with the standards.

I hope this will be helpful to you, if you have any further questions please let me know.

Very truly yours,

C. W. Kreutzer, M.D.
Associate Medical Director

C. U. Dornehl, M.D.
ed

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