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HEALTH RISKS DOSE-RELATED

DR. GEORGE W. WRIGHT - INTERVIEW

To learn more about the present state of our medical knowledge on the health effects of asbestos, we interviewed Dr. George W. Wright, a leading authority on respiratory disease and asbestos health research.

Q: In 1969, an article published in the American Review of Respiratory Disease, you reviewed the knowledge we had gained up to that time from asbestos and health research. Has there been a great increase in our knowledge since then from additional research?

GW: A great deal of research has been carried out since 1969 along two lines. First, we have conducted or initiated a number of epidemiological studies of populations occupationally exposed to asbestos. These studies have been conducted throughout the world and from them we have gained valuable knowledge about occupational exposures and biological responses.

Second, we have been attempting through animal research to learn more about the geometry of fibers and whatever biological response occurs. There also has been some effort to use animals to look at the normal way in which humans are exposed - in contrast to putting materials into the pleura or peritoneal space, which is not comparable to human exposures.

I would say that we are in a far better position to look at the whole problem in a more rational way than we were in 1969. This isn't to say that everything has been done, since there still are some areas where we would like additional information.

Q: It is generally acknowledged that asbestos exposure can lead to increased risks of developing asbestosis, bronchogenic cancer, and possibly, mesothelioma. Have other health problems related to asbestos exposure been identified or brought under suspicion in recent years?

GW: Among the things that have come to light since 1969 is the information that there may be two other tumors occurring in excess among people who have been exposed to asbestos fiber by inhalation. In occupationally-exposed groups, there does appear to be an excess of the broad category of

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DR. WRIGHT INTERVIEW, continued

of gastrointestinal (GI) tumors. But studies indicate that if this excess does in fact occur, it is of a very low order. Moreover, it occurs only in those who are the most heavily exposed - the kinds of exposures that simply do not occur at the present time and probably have not occurred in the last 10 to 15 years.

The second tumor reported as occurring in excess in workers occupationally exposed to asbestos is cancer of the larynx. This has been reported from a very small scale study. In larger studies, such as those done by Dr. Corbett McDonald in Canada and Dr. Irving J. Selikoff in New York, and large scale studies in Great Britain, an excess of laryngeal tumors has not been noticed. This is a matter that needs more study, and is being studied now.

Q: In that light, you noted in your 1969 review that the knowledge required to protect all workers was not yet available, and that its development was one of the urgent tasks of the immediate future. Have we made progress in that direction?

GW: The question of whether we can, in occupational and public exposure settings, set a limit that will protect all people from any possible harm from asbestos is still somewhat up in the air. To develop information along these lines requires not only the ability to recognize the biological effects, for which we are reasonably well-equipped at the moment, but also to reconstruct past exposure histories. While we can measure recent exposure histories with some degree of validity, reconstructing exposures back over 30 or 40 years is quite another matter. We do have the ability to categorize people into light and heavy exposure groups in the past, but we encounter difficulty in the intermediate ranges.

I believe we are in a position now to completely support the view I expressed in 1969 that both asbestosis and bronchogenic cancer are dose-related. In other words, there is a level of exposure where one would anticipate that the risk of getting cancer of the lung or pulmonary fibrosis would be inconsequential. With respect to mesothelioma, there is evidence that this tumor likewise is dose-related...and this certainly is new information since 1969.

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DR. WRIGHT INTERVIEW, continued

Q: Do you believe then that the present proposals by OSHA that would further lower the asbestos standard are necessary and achievable?

GW: First, it is important to indicate that our ability to control dust emissions in the workplace has been enormously augmented in the past five to six years. What at one time seemed a monumental task - that is achieving a 2 fiber per cc exposure limit - has now been shown to be, in most circumstances, an achievable one. If the proposed standard of 0.5 fibers per cc comes into being, I suppose some could say that the current view that 0.5 cannot be achieved is not very reasonable. On the other hand, I do believe that the effort to get to 2 fibers per cc utilized available methods that perhaps weren't being applied. It would be my judgment that, at this time, currently existing methods that will drop everything to 0.5 fibers or below are not available. They would have to be developed, and in that sense, we are in a very different position than we were in 1972. While I think we can get down to 2 fibers in most manufacturing, although maybe not milling operations, I think we would have to develop new methods to get below that. And, I must emphasize that while we have been learning things on the biological side to indicate that 2 fibers per cc represents a very high probability of protection, we've also gotten indications that this level can be achieved.

Q: Are you saying that you believe that a 2 fibers per cc standard will protect everyone from asbestos-related health risks?

GW: I say it has a strong probability of protection. The problem of human susceptibility is such that short of the agent being completely absent, we will have little hope of saying that any level on the low side will protect millions and millions of people who might be exposed. There always will be the one or two individuals out of many millions who might be so susceptible for various reasons that levels that completely protect 99.999 percent of the population might fail with 0.001 percent. This is true no matter what you are doing, whether you are talking about how people live in society, drive cars, swim or eat food. You can't really protect absolutely everybody.

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DR. WRIGHT INTERVIEW, continued

Q: Are you still convinced that cigarette smoking among people exposed occupationally to asbestos greatly increases the risk of lung cancer?

GW: Such studies that have been made since 1969 support the concept that smoking cigarettes acts synergetically with whatever the phenomenon is of asbestos that promotes bronchogenic cancer. Whether or not asbestos is a carcinogenic agent in its own right has been looked at, and I think the consensus at the moment is that it is not. But, it acts in providing a substrate on which smoking can play its role in a more potent way than it does in the absence of asbestos.

Q: You've stated in the past that much of the disease being seen today is the result of working conditions that existed in the past. Can we expect a leveling off or decline in these cases at some time in the future?

GW: There's no question about that. There is no evidence of an excess of disease in persons who have been employed in the asbestos industry during the last ten to 15 years. Only when we go back beyond that do we see cases in people who were occupationally exposed 20 to 25 years ago - maybe only for a few years, but with heavy exposures that began 25 years ago.

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Here we get into the matter of latent periods. No matter what your exposure, it takes a certain length of time for disease to develop. Also, whether your exposure was light, moderate or heavy plays a role. So the facts are that what we are observing today is disease occurring in people whose initial exposures were years before, when the levels of exposure were much higher than they are today.

I sincerely believe that people exposed today at levels exposures ought to be - let's say 5 fibers per cc or less - will not have any abnormalities at the end of 30 years.

I would think that as far as pulmonary fibrosis and bronchogenic cancer are concerned, we could expect to see an excess of that for another 10 years, maybe a bit longer. My reason for saying that is that the industry really didn't get down to contrastingly low exposure levels until about 15 years ago, and the biggest change has been in the last 10 years. Now, that isn't to say nothing was done before that. We began improving dust controls in the 1930's, and work environments in 1935 were certainly cleaner than in 1925, and by 1950 they were again cleaner than they were in 1940. Beginning about 1965 some intensive efforts were again made, and I would say that from 1965 on we began to get close to the low exposure levels where we are now.

DR. WRIGHT INTERVIEW, continued

I think that, providing the industry continues to do what it should be doing to reduce exposures, anyone beginning their work in the industry now should have nothing to fear. There still is a danger from the intermittent high exposure due to equipment failure and problems, but we have learned how to control these by requiring protective equipment such as respirators and following other emergency procedures.

Q: Do you still believe there is no significant threat to the public from ambient exposure to asbestos fiber?

GW: Although we still do not have a great deal of knowledge about the numbers, lengths and diameters of asbestos fibers in the air and water, what we do have substantiates over and over again that the general air and water contains very small numbers compared to occupational environments. Even the lowest occupational exposure is many times greater than that from the general ambient atmosphere. Furthermore, they are almost solely very short fibers, and therefore, constitute an exposure that animal experiments have shown to be no significance or an exceedingly minor one. I believe that any new information we have developed in the last 5 to 6 years thoroughly substantiates my belief that there is no threat to the public from ambient asbestos exposure.

Now, I want to make the distinction between public and para-occupational exposures, which is not done too often. There are people in the public who are not employed in the asbestos industry, but are associated very intimately with people who are - either their families, neighbors or they could be do-it-yourself types who don't know they are being exposed. Some of these individuals may experience a substantial exposure to asbestos. If you exclude that group along with the occupational one, then the remainder of the public is at no risk at all, as far as I'm concerned.

There are still those in the public who exaggerate the problem based on the occasional isolated case - which is very difficult to be certain about in terms of exposure. Some people have exposures they don't even know about, or have forgotten. These could be important factors in the occasional cases that are exaggerated.

Q: One last question. How would you feel today if someone very close to you was considering going to work in the asbestos industry?

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DR WRIGHT INTERVIEW, continued

GW: I wouldn't be concerned at all if I knew where he was going. If he was going into a plant where little or no attention is paid to environmental control, I certainly would encourage him not to do that. If I knew he were going into a facility where they were taking the necessary precautions, I'd prefer to see him there than out somewhere in an unknown area. There are other hazards besides asbestos, and some of these are not as well controlled. Also, I would do my best to give him some background information, and I would hope the industry that employs him would do the same. Any man who goes to work under these circumstances should be educated about the possible health risks....not so that he can go somewhere else, but so he can do what the industry can never do for him - and this is to work carefully and not do things that lead to a breakdown of all the precautions that are being taken to protect him.

DR. GEORGE W. WRIGHT

Now an independent medical consultant, Dr. Wright was Director of the Department of Clinical Physiology at the Saranac Lake, N.Y. laboratories of the Trudeau Foundation, where he was instrumental in developing the pulmonary function test now widely used to measure lung capacity and ability. He also served as head of the Department of Medical Research at St. Lukes Hospital in Cleveland and Professor of Medicine at Case-Western Reserve University in Cleveland. At the present time, he is Chairman of the Scientific Committee of the Institute for Occupational and Environmental Health - which funds many asbestos-related medical studies, and is a member of the Permanent Commission and International Association for Occupational Health. His professional memberships and list of medical papers he has written are numerous.

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ARTICLE 2

WHAT ARE THE HAZARDS?

Three human diseases are associated with excessive inhalation of asbestos fiber. They are asbestosis and an increased risk of bronchogenic (lung) cancer and mesothelioma. It is possible that there also is an associated excess risk of developing gastro-intestinal (GI) cancer.

ASBESTOSIS is a non-cancerous lung condition that can be caused by excessive inhalation of asbestos fiber over many years. It is one of several diseases classified as pneumoconioses, each of which is caused by inhaling a specific foreign material into the lungs. Other diseases in this category include siderosis, caused by iron dust particles; silicosis, caused by free crystalline silica; and coal workers pneumoconiosis, caused by coal dust.

A person with asbestosis may experience unusual breathlessness after periods of physical exertion. This occurs because an excess of dust in the lungs causes a generalized thickening of the delicate lung tissue. The result is that the lung cannot do the job it is supposed to - provide oxygen to the body.

Asbestosis can be detected through the regular medical exams provided by the Company. Since modern environmental controls have greatly reduced the amount of airborne asbestos fiber workers could be exposed to, most experts believe asbestosis will cease to be a significant health risk in the future.

The cause of BRONCHOGENIC (LUNG) CANCER, like many other human cancers, remains a medical mystery. This form of cancer is identical to that prevalent among heavy cigarette smokers.

With only one or two exceptions, bronchogenic cancer has been found only in asbestos exposed workers who also smoke cigarettes. Many researchers believe that if an asbestos exposed worker does not smoke cigarettes, he has no greater chance of getting this disease than any other person who does not smoke.

MESOTHELIOMA is a very rare cancer of the lining of the lung or abdomen cavities. Little is known about the biological factors involved with development of this disease. Recent research appears to indicate that asbestos is not the only material - if indeed it is one of the many - that might cause this disease. There are numerous reported cases of mesothelioma among people who appear never to have been exposed to asbestos fiber. Other studies also seem to indicate that other agents or co-factors (co-carcinogens) are necessary before mesothelioma can develop.

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WHAT ARE THE HAZARDS, continued

All of the asbestos-related diseases have long latent periods between the onset of continued exposure and the time of development of the disease. These latent periods range in time from 8 or 10 to 20 years for asbestosis to 20 to 40 years for mesothelioma.

Medical scientists presently are investigating the possibility that asbestos workers face an increased risk of developing gastrointestinal cancer (cancer of the digestive tract). Medical evidence of any increased risk from these additional afflictions still is inconclusive, and it is believed by most experts that efforts to control other known risks will protect against these forms of cancer.

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ARTICLE 3

ENVIABLE MEDICAL CARE PROVIDED J-M EMPLOYEES

Johns-Manville employs more medical doctors than could be found on the staff of most metropolitan hospitals - more than a hundred worldwide.

Medical personnel are assigned to care for the health needs of employees at each of the Company's 129 plants or mines. Complete on-site medical facilities, staffed by full-time physicians, are provided at major facilities such as the Manville plant and Jeffrey Mine. The Waukegan plant and other large operations also have on-site medical facilities, directed part-time by licensed physicians. All other J-M plants or mines have contracts with physicians who spend varying amounts of time tending to the needs of J-M people. A large team of industrial health nurses and other qualified medical personnel complement the quality medical care provided by the Company.

J-M's medical staff does more than tend to cuts, bumps and upset stomachs. In some instances, physicians provide comprehensive medical examinations for employees. At least once a year, every employee who is potentially exposed to asbestos in his work for J-M will receive a free medical examination. These comprehensive examinations, stipulated by the Federal government, include X-rays and pulmonary function tests to detect early signs of any health problem associated with asbestos exposure.

X-Rays are one of the most important diagnostic tools used to keep a constant check on the health of asbestos-exposed employees. They are read by qualified radiologists, also employed by J-M, and periodically are rechecked by other qualified radiologists to assure accurate readings and/or diagnosis.

If a health problem is detected in a medical examination, either the employee or the employee's personal physician will be alerted, whether the problem was occupational in nature or not. If additional testing is required as a result of the Company-provided exam, this also is provided free to employees.

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ARTICLE 4

DON'T TAKE DUST HOME

It's been one of those days.

You work with asbestos and you just put in a hard shift. You can't wait to get home, take off your shoes, and just relax until dinner is on the table. What the heck. You'll just go home in your work clothes today, and clean up there. Nothing wrong with that, right?

W R O N G!

There is something wrong with that attitude, a far too frequent one among workers who may come into contact with asbestos on the job.

While the Company is doing everything it can to maintain a clean workplace, it is almost impossible to prevent some contact with asbestos fiber in many operations. That's why work clothes and other items that might possibly have collected asbestos fiber should not be taken home. Rather, workers should change clothes at the plant, and then periodically take their work clothes home for cleaning separately.

Asbestos fiber on clothes, shoes and equipment miss the normal maintenance procedures in J-M operations. Therefore, going home in work clothes poses a risk that other persons might unknowingly be exposed to airborne asbestos.

Although the cases are very rare, there have been reported incidents of family members being unnecessarily exposed to fiber brought home on work clothes, shoes and other items. For the health of all concerned, employees should change from work clothes to street clothes at day's end. And, washing work clothes separately from other items will prevent any transfer of dust from garment to garment.

Sounds like a lot of trouble. But, then, isn't the health of family members and friends worth it?

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ARTICLE 5

FOR THE CUSTOMER'S SAKE

Johns-Manville's dust control expertise travels with every bag of asbestos fiber it sells - even when the fiber is not in the bag.

J-M believes that control of asbestos fiber in the workplace is a responsibility that extends beyond our plants into those of customers and other users. Years of research and product development efforts have gone into assuring that asbestos can be safely handled and used once it is sold.

Each year, J-M sells more than 775,000 tons of asbestos from two mines in Canada and each shipment of fiber is designed to create the least amount of handling problems for purchasers.

Customer concern starts with the bags - four different types are available. The standard bags are of strong construction to reduce the chance of breakage. But beyond that, J-M also is shipping fiber in a pulpable paper bag that can be dumped unopened in papermaking operations, and in a polyethelene bag that also can be dropped unopened in certain other manufacturing processes, such as floor tile. Each bag is pressure packed to reduce dust generation in case of broken bags.

Shipments by water routes are made in containerized trailer units, which can be loaded on and off ships without opening the units. Bags of fiber can be shipped either on pallets or cardboard deck sheets to facilitate unloading. Greater use is being made of "assigned" railroad cars with double-wide doors that enable fork lift trucks to load and unload easier.

Part of this shipping procedure involves inserting inflatable dunnage between the pallets to prevent shifting during transport.

If a customer requests it, entire pallets of bagged fiber can be covered in shrink-wrap polyethelene film as further protection from dust.

Very often, fiber handling systems developed for J-M operations find application in customer plants. Examples of these are in-plant fiber handling systems (J-M will supply schematics and cost estimates) and advances in automatic bag opening equipment. In the latter case, automatic bag openers have been developed by J-M and other manufacturers' systems have been put to practical testing at J-M mines and mills.

Product research by J-M has resulted in the development of pelletized fiber, which now is being shipped to many customers. The pellets use water as a binder and are virtually dust free. Development work also is continuing on high density asbestos fiber blocks, also dust free with the added advantage of consuming less space than pressure-packed bags.

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ARTICLE 5

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FOR THE CUSTOMER'S SAKE, continued

All of these concepts in fiber packaging and shipping are geared toward making control of airborne asbestos fiber in our customers' plants easier or unnecessary.

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