

DR. KOTIN'S COMMENTS ON ASBESTOS
RELATED DISEASES TO THE
NEW YORK SOCIETY OF SECURITY ANALYSTS
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PLAINTIFF'S EXHIBIT

CT-278

"Thank you. I'd like to say this is a new experience for me, but I'd be lying. I was part of a chautauqua when we had a stock issue some two years ago, and that's when I was introduced to what is really an awesome concept--the financial community. For the next fifteen minutes (Unlike Fred Pundsack, whether I have much to say or little to say, I always take a long time saying it), I'm going to treat you as a combination of medical students, public health officials, as well as members of the financial community. What I'd like to discuss is the general area of asbestos-related health problems, including asbestos-related disease---what are they, and what it is that everybody should know. Secondly, I'd like to review who is a risk and what the dimensions of that risk are, and, finally, in a chronological way, to compare the distant past with the immediate past, with the present, and then do a little crystal ball gazing.

Let me begin by just describing very briefly what the asbestos-related diseases are. The longest known disease is the disease of asbestosis which is a first cousin to silicosis, berylliosis and coal-miner's pneumoconiosis--terms I'm sure you've come in contact with in your financial wanderings. These "osis" diseases are really generic terms for the replacement of the functional part of the lung by scar tissue. And this is due to the inhalation of excessive amounts of asbestos, and I say deliberately excessive amounts because, for all external agents there is a built-in defense capability that has evolved over eons of time. First, then, if we can formulate a series of maxims as we go along--exposure to asbestos does not carry with it the inevitable corollary that you're going to get an asbestos-related health problem or an asbestos disease. Again, asbestosis--scarring of the lung--is rather typical. It is a disease easily diagnosed by a specialist in the field of chest diseases or x-ray, and it is progressive unless there is some intervention in the form of, for example, taking people out of the environment early enough to halt the disease. It can also be beneficially impacted by giving up smoking if the person does smoke or never smoking if they don't. In general, as you might suspect, asbestosis interferes with the breathing capacity of the person when it becomes advanced enough. He has less air space in the lung, therefore he gets short of breath easily. Asbestosis is not cancer, it never can become cancer, it never will become cancer. Heaven only knows its bad enough to have asbestosis without cancer.

Let me move on to the next asbestos-related disease--one characterized by the tongue-twisting title of "mesothelioma". (I'm a pathologist by specialty training and such tongue-twisting names are pathologists' stock and trade.) The cells that line the chest

CTD032329

city and the abdominal cavity as well as the cells that cover the lungs and the intestines and the abdomen are known as mesothelial cells. They're special silicone-type cells which help keep the surface of the intestines, the lower diaphragm, and the lungs above the diaphragm slick. They also line the two abdominal cavities and keep them slick, so that when you inhale and your lungs expand and bump up against the inner lining of the chest, they don't stick but slide off one another in a very smooth way. This allows for the expansion and contraction of the chest. And in the abdomen it allows for the normal contractions of the intestines (peristalsis) where, again, the outer walls of the intestines rub against one another or against the lining of the peritoneal cavity and the silicone substance keeps them from irritating and forming scars.

For reasons we don't clearly understand, only a very small percentage of persons exposed to asbestos get this disease. (Even the wildest projections, in the most heavily exposed, put the attack rate at perhaps 7-9%--and in terms of decades). At any rate, it is a very uncommon disease, and it is a disease that is truly a cancer. Because it comes from mesothelial cells, we call it a mesothelioma. It is invariably fatal, rather rapidly, and we have no treatment for it. But again, let's formula maxim #2--as with all cancers, asbestos is not the only known environmental agent that can cause mesothelioma. In fact, we know of a lot of hybrid substances in the laboratory that can cause the disease when they are injected into the chest cavity or the abdominal cavity of an animal. In certain instances, exposure by inhalation can cause it. There are certain types of fibers, such as zeolites, which are part of the earth's crust and which have been associated with this disease (particularly with a couple of villages in Turkey, where zeolites of a fibrous type compose the main part of the earth's crust there). These aren't occupational exposures; the victims are the people who live in the area because they live in houses built from blocks hewn out of the local rock. The mesothelioma attack rate there is pretty high--many times greater than with asbestos. I think one must recognize, from the first breath that a newborn inhales in this area, to the last breath an elderly person unhalles prior to death, there is zeolite suspended in the air.

That's the second disease of the triad of asbestos-related diseases. The third is lung cancer. Lung cancer perhaps merits special attention. First of all, people who never heard of the word 'asbestos'-- who couldn't spell it, let alone be exposed to it environmentally--face an increased risk to lung cancer if they smoke cigarettes. This has been thoroughly documented, and rather precise data correlating the risk with exposure are available in scientific literature. The combination of asbestos and smoking is particularly dangerous--deadly, if you will, because smoking converts an innocuous level of exposure to asbestos into a harmful one. Lung cancer is a cancer derived from the cells that line the bronchial tubes.

Now normally--again except on the top of Mr. Everest--we are all inhaling alien substances from the air and have been since long before the industrial revolution (including the erosion of irritating dusts from the earth's crust by winds). Built into the lungs are a couple of defense mechanisms that are very exquisite. I won't go into detail other than to say that one of these mechanisms is a layer of mucus formed by cells that line the bronchial tubes: it acts as a mechanical barrier over the cells so that anything that settles out after you inhale, settles on this mucus barrier. In addition to these mucus-producing cells, and located next to them in the lungs, there are cells called cilia that have little whip-like processes which are the motive power for the mucus blanket. From your moment of birth to your moment of death, they propel the mucus blanket in the form of an escalator up to your throat where you unconsciously may swallow the mucus. If there's an excessive amount like when you have a cold, or if you smoke cigarettes, you hack and cough to get that extra amount of mucus out.

When asbestos is inhaled at levels which are non-disease producing in the presence of cigarette smoke, the smoke, diabolically does two things to this defense mechanism. First, it paralyzes the cilia-- slows them down--and essentially brings the escalator to a stop. So that instead of physiologically clearing the asbestos from your lungs it piles up. It's as though people were continuing to go onto an escalator that had stopped. Each level would begin to get 3 people. 4 people, and one would be piled on top of another in sort of a helter-skelter way. And really, quite precisely that's what happens. If the best brains in the world--everybody from Caltech to MIT--were to put their minds to work to devise an aerosol, something you could inhale that would specifically destroy this defense mechanism, they couldn't do a better job than nature did, in terms of the combustion products of tobacco.

The second defense that the body has is a series of cells called phagocytes. These cells have the capacity to ingest fibers, ingest bacteria, ingest dirt. Once ingested, they're essentially immobilized; germs, particularly in the case of infectious diseases such as pneumonia or the flu (unless there's an overwhelming dose) are immobilized and destroyed, so that even if you're exposed to somebody with the flu or with a cold, you always don't get the flu or a cold. And it's the same with asbestos fibers, or silica, or aerosol beryllium or just plain dirt from Central Park after three or four weeks of non-rain. Well, cigarette smoke diabolically destroys these cells, too. So the two defenses nature has evoked over cons of time are destroyed by cigarette smoke. This, as I say, allows asbestos in an occupational setting or in the general environment (asbestos in concentrations which would normally have no adverse effect) to be transformed into something lethal. I take this time with lung cancer for two reasons. First of all, lung cancer is the most pervasive of all the asbestos-related diseases.

could add up all the cases of asbestosis, which is pretty much a controllable disease even after it has occurred, and all the cases of mesothelioma, and put an exponent of 3 or 4 opposite this number, and they still wouldn't add up to the morbidity and mortality associated with lung cancer. In fact, asbestos wouldn't be worth a line on page 27 if it weren't for the lung cancer component. And it is all the greater tragedy, because asbestos is the modifier in the lung cancer development--and this applies to cancer of all sites, though we'll concentrate on the lung. I'll give you three examples of what I mean: uranium mining carries with it a lung cancer risk, coke oven working in the steel mills carries with it a lung cancer risk, and asbestos carries with it a lung cancer risk. For all three of these diseases, the determinant is the smoking: If it weren't for the cigarette smoking by the person working top side at the coke oven or with asbestos or by the person mining uranium (oh, he might get a different kind of cancer because of ionizing radiations--bone marrow effects like leukemia formation or thyroid effects) we really wouldn't have lung cancer as a problem.

Now, you may ask how do you know which is the determinant and which is the modifier. I could tell you very, very, simply. If you remove the modifier from the group of two areas--let's say take two agents, smoking and asbestos--you will have a minimum if any impact on reducing the risk. If you remove the determinant, you will have a major impact on the reduction of the risk. And lo and behold, as has been known for cigarette smoking and by general public for years and years, that cessation of smoking will reduce your risks. I don't care how long you've smoked or how much you've smoked--even 2 packs a day, for 20 years. If you started at 20 and stopped at 40, by the time you reached 50 you would just about return your risk level to that of a non-smoker. The same thing happens with asbestos. An asbestos worker who has a history of long-term exposure who stops smoking and who is lucky enough not to have any problems for the next decade, has reduced his risk by at least half--maybe more. I won't repeat this anymore, though it's something that probably could be discussed for hours. But I think it can be summed up in really one sentence: Except for cigarette smoking, lung cancer would not be an asbestos-related disease. And since, asbestosis is a controllable disease and mesothelioma is a lethal but rare disease, it all comes back to lung cancer. And it all adds up to one hell of a bum rap (so I won't be parochial) coke ovening, beryllium or uranium mining and for asbestos.

I should mention for the sake of completeness that you may read in much of the material that you have before you that gut cancer, (stomach and colon cancer), larynx cancer and esophageal cancer are also reported to be associated with asbestos exposure. Larynx and esophageal cancer can be disposed of with a flat statement: There still has yet to be a case of laryngeal cancer or esophageal cancer in an asbestos worker who's not a cigarette smoker. That's a flat statement. As far as gut cancer is concerned, there's no doubt

It a small increased risk has been demonstrated in workers exposed to heavy, heavy exposures in the past. But now we're beginning to see that the validity of the association between the occurrence of gut cancer and asbestos exposure--if there ever was one-- is becoming more and more suspect. This, of course, has great impact on the company I happen to work for, because of the fact that asbestos cement pipe is a first rate product that we make for the conduiting of potable water. And many questions have been raised about why asbestos cement pipe is used for potable water if GI cancer is a risk. Again you can make the flat statement that there's no evidence (and it isn't because nobody hasn't sought it) that asbestos in drinking water has any kind of an impact on increasing the risk of cancer. The data aren't just about water from asbestos pipes but from parts of the world where asbestos is part of the earth's crust, and is present in the water in concentrations that are heroic-- 10^6 , 10^9 , or a billion fibers per liter. In areas adjacent to mines--adjacent, in fact, to our own mines, both in Newfoundland and in Quebec--the concentrations of asbestos in the water are very, very, very high. And they've been high since the beginning of time--since the first caveman dug a cave. And it isn't that the Canadian government hasn't looked for associations, or that we haven't looked for associations between ingestion of asbestos and increased risks of any form of cancer. There just aren't any.

Okay, now for the past, present, and future. There is little doubt that every study that has been done by the government by the National Cancer Institute, by the National Institute of Occupation Safety, by industry itself in the United Kingdom, by Johns-Manville, and by independent academic institutions--perhaps the most famous of which was done in your own town here, by Mt. Sinai--clearly demonstrate a decreasing risk of asbestos-related disease associated with the cleaning up of the occupational settling and the general environment over the last decades. And we can say--not even in the anthropologist's sense of time, but in the time of many of you people in this room--that asbestos-related diseases, certainly lung cancer and asbestosis, will have disappeared two or three decades from now, if smoking becomes a nonhabit for those exposed to asbestos. In terms of asbestosis, we've already taken care of it. Not a single firm in compliance with OSHA standards is generating any new cases of asbestosis or in non-smokers any new cases of lung cancer.

What does that do, then, in terms of the immediate future as distinguished from the long-distance future? I think it requires an appraisal of asbestos in terms of what we know about all toxic hazards, and that is that asbestos is not unique. I'm not prepared to tell you that asbestos is good for you but I am prepared to say that to the extent that I know anything about it, there are many many purposes it serves even in my field of medicine, that

CTD032333

require the unique characteristics of asbestos. Nevertheless, asbestos-related diseases or asbestosis conform to all the laws of pharmacology, toxicology, pathology, medicine, and so on, so that there is a dose response. This is terribly important because it is only on that basis that anybody with any kind of responsibility can say that asbestos should have a continuing place in commerce. Second, there's a demonstrated no-adverse effect level--a level to which you can be exposed to asbestos for a full working life time under properly controlled conditions which would not be associated with the generation of any asbestos-related disease. Finally, and perhaps most important, in diseases produced by multiple factors (things in combination) where asbestos is truly one of the factors, the control of the other factor--i.e., smoking represents a potentially rewarding approach to control.

Let me close by taking a pot shot at my former boss--the secretary of HEW. I spent ten years with him, and now unhappily live with many of the regulations I helped promulgate. But that's life. In an case, Mr. Califano made some projections with much fanfare some months ago (I can give you the exact date actually: September 15, 1978) in a speech entitled "The Estimates of the Fraction of Cancer in the United States Related to Occupational Factors". You may recall that in it he said that approximately 20 percent of all cancers in the future were going to be related to occupation and that 80 percent of these were going to be related to asbestos. God knows there's enough in the way of horror in the past of asbestos that's real so that you don't really have to fabricate things. This document has created much concern in the scientific community; it is trotted out everytime anybody talks about what American industry is doing to the American worker. And though industry has done alot to the worker in past decades to be unhappy about, this is not one of the things.

Let me quote from the most distinguished scientist in the world in the field of occupational diseases and epidemiology: Sir Richard Doll. He is Regius Professor of Medicine at Oxford, and you really can't get much higher than that. (As an aside, we've submitted a hundred-odd pages refuting Mr. Califano's document, but we figured that somebody from overseas might have a little more of an impact).

"I can assure you that neither Dr. Schneiderman [Head of biostatistics at the Cancer Institute and generator of the document, per se] nor Dr. Upton head of the National Cancer Institute who, incidentally, worked for me in the past can be in any doubt about my views on the HEW paper. They have been told--and told frankly--that I regard it as scientific nonsense--a view which was widely endorsed at the recent meeting of the American Society of Preventive Oncology.

CTD032334

Oncology being a fancy name for the study of cancer and related diseases. If Dr. Schneiderman regards the comments as 'surprisingly meager to date' This is when Dr. Schneiderman wondered why more people didn't attack the results, it can only be because he was expecting a torrent of criticism".

I know that Dr. John Higginson (director of the International Agency for Research on Cancer) is preparing a public reply. The best that the IARC (an agency of the World Health Organization) can come up with on the basis of its rather sophisticated statistical studies is a 3-5 percent increment for all cancer, including the occupations. This had been their position prior to the 1978 Califano statement. Dr. Higginson's new paper is going to reaffirm it. It all adds up to really what I am herefor, and that is not to do anything other than put asbestos-related diseases in context. They exist. They're the result of phenomenal exposures, unconscionable exposures in the past. They have taken 20-30 years to occur for biological reasons which I'd be delighted to go into at some other time; we're seeing the results of that. But the fact is that we're on the descending slope of the incidence curve in relation to the broad spectrum of asbestos-related diseases. I can't say that about mesothelioma because we don't know that much about it. But in terms of the assumption that asbestos represents a unique hazard--a hazard that is special because of the fiber configuration of asbestos--this is a lot of nonsense. It is potentially hazardous stuff, no less than aspirin--two will cure a headache, 50 will make you sick, and 100 will kill you. A typical dose response--for asbestos no less than for aspirin. I've compressed one year of the pathology of lung diseases and toxicology into 20 minutes. If you have any questions, I'll be very pleased to answer them."