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CASE NUMBER: BC 360274
CASE NAME: BARBARA J. O'NEIL, ET AL.
VERSUS
BUFFALO PUMPS, INC., ET AL.
LOS ANGELES, CALIFORNIA MONDAY, JANUARY 7, 2008
DEPARTMENT 42 HON. ELIHU M. BERLE, JUDGE
APPEARANCES: (AS HERETOFORE NOTED.)
REPORTER: LINDA NISHIMOTO, CSR NO. 9147
TIME: 1:30 P.M.

(In open court; jury present:)

THE COURT: Good afternoon, ladies and gentlemen back on the record in the case of O'Neil versus Buffalo pumps. All members of the jury are present and seated counsel are present. We are still on the opening statements. Do you wish to continue shall Mr. Mo land.

MR. MOLLAND: Thank you, your Honor.

Good afternoon, ladies and gentlemen.

I am going to pick up where I left off I am almost done with the Yarway equipment but a couple of more minutes on that, five or ten more minutes on some other minutes and then I will pass to the other defense counsel.

We were talking when we broke for lunch, about insulation and the fact that Yarway didn't make it. I am not going to repeat ought that. It's clear Yarway was not insulation manufacturer or supplier. That is not how the insulation got on the Arizona because the Navy require the insulation and required the asbestos in it and bought it

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1 from others like Celotex or Johns Mansville or made it
2 itself out the Amosite from its contract shipyards or Navy
3 ship yards.

4 Steam trap. The drawings that we have for
5 the ex-ex-class destroyers showed there was any asbestos in a
6 steam trap but I have to tell you this. Mr. Hart showed you
7 flanges there are flanges on the steam trap. The flanges
8 are right here. These flanges on the steam traps were --
9 gaskets were used on them. And this type of gasket that was
10 used on this type of steam trap, it is metal. It has and
11 during the time of Mr. O'Neil was on the Oriskany, this
12 particular type of gasket was called a metal spiral wound
13 gasket. It did have small pieces of asbestos paper in the
14 rings of this metal gaskets and they fit on the sides of the
15 steam trap and Yarway didn't make them. And Yarway didn't
16 supply them. The Navy bought them from others. Principally
17 some other companies of names that you will hear. The Navy
18 put them on. The Navy took them off and when the Navy
19 bought the steam trap from Yarway to put on the Oriskany,
20 these didn't come with them. But the Navy put them on and
21 the Navy took them off and if there was asbestos in them, it
22 was because the Navy required it to be there. If there
23 wasn't asbestos in them and sometimes there wasn't, it was
24 because the Navy said it shouldn't be there. That was up to
25 the Navy.

26 There are documents in this case for Yarway
27 that show on Essex class destroyers like the Oriskany, what
28 kind of steam traps it had on that ship. There were -- most

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1 of them, almost all of them look like this one. Probably a
2 little smaller but they sort of looked like this one and the
3 drawings that we had, the documents that we have show there
4 wasn't any asbestos in them. Now, because everything I have
5 told you, the plaintiffs Navy expert was going to tell you
6 about how the Navy constructed the ships and what was on
7 them has testified and we believe he will testify again that
8 as far as the Oriskany is concerned, he has not seen any
9 documents that show that Yarway when it sold the Navy
10 equipment in the 40s and 50s to put on a ship, put any
11 asbestos on that ship through the equipment it sold the
12 Navy. That is what the plaintiffs' expert has said based on
13 the documents he has reviewed.

14 A couple more subjects, I told you about the
15 Navy and I told you about asbestos use and I told you about
16 what the Navy knew about asbestos and when it knew it. I
17 want to now turn to what the connection between Mr. O'Neil
18 and the Navy and Yarway is. The bottom line is that as far
19 as Yarway is concerned, Mr. O'Neil we believe never worked
20 with any Yarway equipment. He didn't work with -- never
21 took apart a steam trap and never took apart a gauge glass.

22 From time to time he was on -- because he
23 was aboard that ship like hundreds of other officers and
24 sailors he was around equipment when it was repaired and he
25 may have been around some Yarway equipment when it was
26 repaired. That is the connection between Mr. O'Neil and
27 Yarway. Now, I have told you what was in the Yarway
28 products that we know from the documents at any rate, and I

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1 have told you what was on the ship because the Navy required
2 it as far as insulation was concerned. Mr. Hart said that
3 the greater amount of Mr. O'Neil's exposure to asbestos on
4 the Oriskany was from insulation. That is right. In fact,
5 we will have evidence that it is the overwhelming part of
6 his exposure to insulation that the Navy bought from others
7 under their requirements and to asbestos containing pads the
8 Navy pad.

9 Industrial hygienist named professor Nicas
10 will testify in this case and he has done a calculation
11 which shows either Mr. O'Neil was exposed to nothing or
12 close to nothing from anything inside a Yarway steam trap or
13 gauge glass or if there was anything, it was something in
14 the order of 1 to 1,000th or one part to 100,000th something
15 in that order, a very trivial amount of exposure if anything
16 at all.

17 That is why when we conclude, we will ask
18 you to return a verdict that Yarway was not a substantial
19 factor in causing Mr. O'Neil's mesothelioma.

20 Now, there is just one other subject that I
21 need to cover with you because Mr. Hart did and I think the
22 evidence on the subject will be somewhat different than he
23 said so I need to tell you what our evidence will be. That
24 is what he preferred to as the warning issue and the issues
25 of what equipment manufacturers could or should have told
26 the Navy about dangers of asbestos, especially asbestos
27 insulation.

28 The fact and we believe the uncontested

1 (Pages 49 to 52)

Page 53 1 evidence will be -- of all of these hundreds of makers of 2 equipment that the Navy purchased and of all of the 3 manufacturers of the insulation the Navy purchased, in the 4 50s up until the time Mr. O'Neil left the Oriskany, none of 5 those manufacturers and none of those suppliers ever told 6 the Navy about the dangers of asbestos insulation. 7 It is true that the six defendants didn't 8 tell the Navy about the dangers of asbestos insulation, but 9 no manufacturer of any equipment that we know of that went 10 on that ship did either up until the time Mr. O'Neil left 11 it. 12 We have two witnesses that will testify on 13 the subject, Dr. Hughson and Admiral Sergeant. And perhaps 14 a witness named doctor gomer. They will say that there were 15 basically four reasons for this. The first is the Navy 16 specifically required asbestos when it wanted to use it 17 aboard ship. In other words, the companies didn't have to 18 tell the Navy if there was asbestos in their products 19 because the Navy told the companies that it would either 20 have to have it there or the Navy was aware it was there 21 because it was part of the rules, part of the 22 specifications. 23 The witnesses will also testify that the 24 Navy had superior knowledge not just equal knowledge but 25 superior knowledge about the risks of asbestos containing 26 insulation used aboard ships compared to any equipment 27 manufacturer and that is because it was testing and doing 28 studies on asbestos insulation during World War II, during	Page 55 1 it. It did so after it made independent decision about the 2 risks and benefits of asbestos containing insulation aboard 3 its warships. It required the sailors to use 4 asbestos-containing insulation and repair it without 5 precautions. This was something the Navy decided as part of 6 its military decisionmaking. It wasn't a decision made by 7 Yarway and with Yarway manufacturing steam traps, it could 8 have told the Navy about asbestos and t would not have 9 changed the way that the Navy conducted its business during 10 the time of war. 11 Ladies and gentlemen I thank you very much 12 for your attention. I am going to conclude my opening 13 statement now. Several other defense counsel are going to 14 follow me and I simply ask that you give them the kind 15 attention you gave me and Mr. Hart and I look forward to 16 presenting our case to you. Thank you very much. 17 THE COURT: Thank you. 18 Who wants to go next. 19 MR. SLAUGHTER: Your Honor, I would. 20 THE COURT: You may proceed. 21 MR. SLAUGHTER: Thank you very much. May it please 22 the court, ladies and gentlemen of the jury, my name is Ed 23 slaughter and I represent the Warren pump company. 24 Obviously there are things in the course of the trial that 25 people disagree about. And you will hear the evidence on 26 the points. It would have been absolutely forbidden for the 27 Warren pump company or any other defendant in this case to 28 refuse to manufacture products for the United States Navy
Page 54 1 the 1950s and in fact, even when Mr. O'Neil was aboard ship, 2 it was testing and working with asbestos containing 3 insulation to find out whether it was dangerous. 4 And I have already mentioned to you it 5 published one the leading studies in the medical literature 6 on whether or not asbestos containing insulation was 7 dangerous. 8 The warning wasn't given to the Navy about 9 asbestos containing insulation as far as equipment 10 manufacturers were concerned and certainly as far as Yarway 11 was concerned because the Navy wrote the book on it starting 12 in the 1940s. 13 Number three, there was nothing in Yarway 14 gauge glasses or steam traps which would have required a 15 warning about asbestos, either there was no asbestos in them 16 as far as the steam traps on the Oriskany or if there was 17 some small amount it was so small it was far below that 18 standard, remember the 5 bill particles per cubic foot 19 standard that was in place in the United States and the law 20 in the Navy that our witnesses will testify no reasonable 21 scientist could have thought that amount of asbestos could 22 be dangerous and would have required a warning. 23 And there is a fourth reason. This will be 24 testified to by Admiral Sergeant. It has to do with 25 military decisionmaking. The military controlled Ensign 26 O'Neil when he was in the Navy. It gave him his orders and 27 he gave his orders to the sailors. The Navy required that 28 the insulation and the pads on the Oriskany have asbestos in	Page 56 1 during a time of war. In 1943, the products component parts 2 began to be built for the USS Oriskany, it would have been a 3 felony for Warren pump to refuse to build things for the 4 Navy when the Navy asked that it do so. 5 In fact, the Navy had the ability through 6 the United States government to seize control of Warren 7 pumps' plants and put naval officers into the plants and 8 force them to make products just like all of the other 9 companies in this case. That is exactly what happened. 10 What happened in a time of war is that all 11 of the companies here, but far with the patriotic 12 obligations and as a matter of law were required to assist 13 the war effort. Not only were they required to build those 14 products, those components, they were required to put 15 asbestos in those products when the Navy called for 16 asbestos. 17 You have heard a little bit about military 18 specifications. What those specifications did was set out 19 for companies like Warren pumps precisely how components 20 parts like pumps had to be made. Routinely the Navy wrote 21 specific military specifications that specifically required 22 asbestos components. This was not a suggestion. It was not 23 a recommendation. It was a requirement written in a 24 document. You are going to see those documents during this 25 trial. That direct evidence of exactly what the military 26 required people like Warren pumps to do during a time of war 27 and the other defendants in in case. 28 I suppose one of the questions is why was

Page 57 1 that required. Well, it was recognized by the United States 2 government that asbestos was vital to the war effort. The 3 president of the United States actually signed an order 4 conserving asbestos. 5 The president of the United States, 6 recognizing that asbestos was vital to the war effort 7 because it was the only product at the time that would 8 safely and efficiently insulate these products, actually 9 issued a dictate that no one in America could use asbestos 10 for anything but filling naval and military orders to make 11 these products consistent with the military specifications. 12 That is just how important asbestos was to the war effort. 13 I don't think you will hear any dispute in 14 this case about that. Why was it so important? You have 15 heard about rear Admiral Sergeant. He is going to come and 16 explain to you why asbestos was vital to the war effort. 17 Asbestos was light weight. As you can imagine trying to 18 float a city on the ocean and drive it at speeds sufficient 19 to fight a war required all the lightest materials in order 20 to insulate these pieces of equipment. Asbestos was the 21 only thing that the government concluded would work or at 22 least work best to help win that war. 23 It would as you have already heard improve 24 the efficiency of the machinery. It would as you have 25 already heard keep work areas safe and protect the sailors. 26 Asbestos was not an option. It was a requirement and it was 27 a necessity. I don't think you will hear much dispute about 28 that in this case.	Page 59 1 discussion about that already and I won't belabor the point. 2 But we are going to show you actual documents during the 3 course of this trial that tells you what the Navy knew. In 4 1922, the United States Navy put out a naval medical 5 bulletin. It's a document and you will be able to see it 6 and you will hear witnesses talk about it that said way back 7 in 1922, the United States Navy new ways to protect people 8 from any hazard of asbestos. 9 You have heard a little bit about the use of 10 respirators and exhaust systems and keeping things moist. 11 Well, the United States Navy knew about that in 1922. They 12 wrote it in their own manual long before they started 13 dictating to people that you must put asbestos components in 14 products. 15 You will see the documents that show you 16 exactly what the Navy knew and exactly when they knew it. 17 You will see another document from relating 18 to industrial health. That talks very specifically about 19 requiring respirators, air supplied respirator and 20 industrial respirators for anyone who is working with 21 asbestos. That is because the Navy knew. The Navy knew 22 that protection was necessary. 23 We will show you another document, actual 24 piece of paper that a witness can talk about, where the Navy 25 wrote their Hospital Corps the doctors and nurses in the 26 Navy who knew about health protection where the hospital 27 corps in 1939 said you knew to use masks for asbestos 28 workers to protect them from asbestos.
Page 58 1 Let me be very specific. And I hope you can 2 see at least that this is a long list. There were at least 3 35 different kinds of asbestos-containing products that the 4 United States Navy required be included in products for 5 ships. And what I mean is they wrote a military 6 specification that said: You must use asbestos for this 7 component. And if you can see it, at the end of each of 8 these thing I have given you a number. Asbestos boards, 9 NAVSPEC 17-16 D. Well, there are very specific pieces of 10 paper, direct evidence for each one of these types of items 11 like packing and gaskets that we will show you during the 12 course of this trial where the United States Navy expressly 13 required demanded that people like Warren pumps use asbestos 14 when making these products. These products that were 15 required to be used by the Navy. 16 Let me be clear about that, the Warren Pumps 17 company never made asbestos contain product period. The 18 Warren pump company like some of the other defendants made 19 metal products which the Navy then required we sometimes go 20 and purchase small components to include made by other 21 people that had asbestos in them. 22 You will hear testimony about that and you 23 will see the documents. The only reason there was asbestos 24 in those products was because the Navy said you have to do 25 it. And they wrote it on a piece of paper and we will show 26 you the piece of paper. 27 This is also very important to focus on 28 exactly what it is the Navy knew and you have heard some	Page 60 1 I don't think there is going to be any 2 dispute about the document. They are real pieces of paper 3 we are going to show them to you. 4 So what we would ask you to keep in mind is 5 that the United States Navy had a need. The United States 6 Navy in a time of war fully understood the perceived hazards 7 of asbestos on their ships but because asbestos was the only 8 thing that the Navy concluded would make their ships 9 efficient and safe for their sailors, they concluded that it 10 had to be used during a time of war and required the 11 companies in this room to do that. 12 That is why it was done. 13 Let me talk to you very specifically about 14 my client Warren. Warren pump did exactly as I have told 15 you, they turned the whole plant over or most of their plant 16 over to Navy production during World War II because they 17 were required to. It was the right thing to do but they 18 were also required to do it. They made metal pumps, 19 similar, larger but similar to some of these metal pieces of 20 equipment that you have seen that were used on the ship for 21 a variety of things including preventing it from sinking. 22 They sold those pumps in 1943 because the 23 Navy told them to. What Warren did not do -- what Warren 24 never did was make asbestos gaskets or asbestos packing or 25 asbestos insulation. If gaskets or packing ended up in one 26 of their products that contained asbestos it's because the 27 Navy required that we go and buy it and put it in there. 28 If insulation ended up on the outside of

Page 61 1 these pads that you heard about, it's because the Navy 2 bought it from someone else and put it on there. If any 3 other kind of asbestos component ever ended up associated 4 with a Warren product it's because it was required by the 5 Navy or put thereby the Navy. 6 The other important point as relates to 7 Warren in this case is regardless of where any asbestos may 8 have ever come from or why it was there, the evidence is 9 going to be absolutely lacking to indicate that Mr. O'Neil 10 ever inhaled any amount of asbestos that was associated with 11 the Warren pump. You are going to hear one witness, witness 12 that the plaintiffs will present who will tell you he 13 believes he may have seen Mr. O'Neil 20 or so feet away from 14 a Warren pump being worked on one time in the 1960s. 15 More than 20 years after it was sold: This 16 piece of metal equipment was under some sort of remayor 17 while Mr. O'Neil stood 20 feet away for no more than 10 18 minutes. Plaintiffs' own witness can't tell you that any 19 asbestos was ever disturbed. 20 Ladies and gentlemen, the simple fact is 21 that Warren like most of the defendants if not all the 22 defendants in this case did what they were required to do by 23 the United States Navy during the time of war and the 1940s 24 when the ship was built. They did it under the Navy's 25 direction, under the Navy's control. The Navy understood 26 the potential risks and hazards of the things they made 27 Warren include in products. They had to do it because that 28 is what made ships work and it's what made it possible to	Page 63 1 business of Leslie during World War II was to provide 2 products to the Navy in accord with the specifications 3 provided by the Navy. 4 Just so you understand this a little bit 5 more, the evidence will in fact show that the control was 6 such that Navy officers and Navy inspector were actually at 7 the Leslie plant on a daily basis. And those officers and 8 those inspectors were tasked with the job of ensuring that 9 whatever products Leslie gave to the Navy met the 10 requirements and the specifications of the Navy and if those 11 products did not meet the requirements and the 12 specifications of the Navy, they were rejected. And those 13 Navy inspectors were there. They looked at the equipment. 14 They studied it to be sure that it complied with their 15 requirements. They tested it. It wouldn't go on a Navy 16 ship unless the Navy had approved it and thoroughly tested 17 it and inspected it. 18 Now, in this case we have the benefit of 19 knowing very specifically what Leslie equipment is involved. 20 Some research has been done at a facility called the 21 national archives where incredibly enough they keep records 22 of the construction of ships like the Oriskany. And the 23 researchers have found documents that show that the Leslie 24 equipment was on the Oriskany. And the researchers have 25 actually found engineering drawings that the Navy kept that 26 showed what the Leslie equipment looked like. On the 27 Oriskany we know Leslie had pieces of equipment called pump 28 governors. Also sometime called pump regulator and I will
Page 62 1 have an efficient powerful Navy. 2 Thank you. 3 THE COURT: Thank you. Who is next? 4 MR. SCADDEN: Good afternoon, ladies and gentlemen 5 My name is Jim Scadden and I represent Leslie Controls in 6 this case. I am going to try to be brief because my 7 colleagues have already described to you many of the factors 8 that I wanted to describe in relationship to Leslie Controls 9 in this case. 10 As I mentioned before I got a head cold that 11 just won't go away. I think I have given it to everybody 12 else in the courtroom too they are all sniffing too. 13 Let me tell you a little bit about Leslie 14 Controls. The evidence is going to show that Leslie has 15 been in business for about a hundred years. Leslie Controls 16 began as a company owned and operated by a family, the 17 Leslie family. Members the Leslie family certainly at all 18 times pertinent to this case ran Leslie Controls from a 19 facility in New Jersey at a manufacturing plant and they 20 employed some people there and they built products for 21 customers like the Navy to use in steam systems and power 22 plants and other things of that sort. 23 Specific to this case as you have already 24 heard from Mr. Slaughter and to an extent in Mr. Molland 25 when World War II was in full swing, the Navy also 26 approached Leslie to provide products to the Navy to use on 27 the warships. As was explained by other counsel, the Leslie 28 plant was essentially taken over during word war 2. The	Page 64 1 switch off between the two pump governors or pump regulator 2 These pieces of equipment are used the steam 3 power trap as you have heard from the other attorneys and 4 they performed a function to make sure the pumps in the 5 system acted in a proper fashion as they were designed to 6 work. 7 We know on the Oriskany there were a 8 dozen -- some witnesses say 18, maybe as many as 24 Leslie 9 pump governors on the Oriskany on the ship that is 900 feet 10 or more long that is adequate to maintain and transport 11 3,000 sailors and air men and to provide them all of the 12 equipment and all the needs that they required to be at sea 13 for weeks and weeks if not months on end. 14 Maybe, maybe as many as 24 Leslie pump 15 governors. 16 There has also been reference to another 17 product that Leslie provided for the Oriskany and that is a 18 thing called a steam strainer. Similar not identical to the 19 steam trap that Mr. L Molland has already explained to you. 20 Quite frankly I believe the evidence is going to touch on 21 that equipment very little. There seems to be lit or not 22 allegation that Mr. O'Neil had any type of exposure 23 associated with that so I am going to talk to you about the 24 pump governors. I want to give you a better idea of what 25 these things were. 26 I am showing you now -- 27 THE COURT: There is an easel in the corner if you 28 want to use that.

Page 65 1 MR. SCADDEN: If I can just hold it for a moment, 2 is that okay? 3 This is enlargement of the Navy engineering 4 drawing that was found in the archives that shows the pump 5 governors that were actually the Oriskany. This is the 6 actual engineering drawing taken from the archives. This 7 is an enlarged meant. It is actually bigger than the piece 8 of equipment in question. Though these are substantial 9 pieces of equipment. We might bring in one. We might not 10 because I don't want to hurt my back because these pieces of 11 equipment virtually all metal could weigh as much as 80 or 12 90 pounds. The ones on the Oriskany weren't as big as this 13 drawing. The ones on the Oriskany would stand from the 14 bottom of the drawing about halfway up. What is that? 2 15 and a half feet tall maybe? Maybe a little more. 16 They weigh about 80, 90 pounds. And you are 17 going to hear in this case about the asbestos components 18 that were associated with these pump governors if any and I 19 can identify them for you because we have the drawings and 20 we have testimony from Leslie and the experts to closely 21 define what that asbestos-containing component may or may 22 not have been. 23 Basically three. This governor is made up 24 of basically three units what we call the top cap and the 25 body of the pump governor and the bottom cap. 26 Where the top cap bolts on to the body of 27 the governor -- and let me switch. I got a better drawing 28 for you. It's easier to see on this one.	Page 67 1 There would be another. 2 ATTY1: Your Honor, so we are clear that this 3 example he showed was not one of those. 4 THE COURT: All right, is my understanding. It's 5 just a sample of copper. 6 ATTY1: Thank you. Sorry for interrupting. I just 7 want to make sure it's clear. 8 MR. SCADDEN: There is another gasket on the pump 9 governor where the bottom cap and body comes together that 10 is metal. It doesn't have asbestos at all. 11 The next place you might have asbestos 12 associated with the pump governor on the Oriskany would be 13 packing used in portions of the pump governor. You can see 14 here on the drawing there is a place where something is 15 labeled a needle valve. Some valves require some packing to 16 seal the fluids within the valves. The gasketing around 17 this needle valve, we believe was in fact a packing -- I'm 18 sorry around this needle valve we believe was 19 asbestos-containing because what is what the Navy specified 20 required for that application. 21 There may also have been some packing around 22 this stem of the valve which again we believe may have been 23 asbestos as required by the Navy and finally down here in 24 the bottom, some more packing may have been utilized. It 25 was asbestos-containing. 26 And I happen to have exemplar of some 27 packing and I am not going to say it's asbestos but this is 28 an exemplar of a tube of packing similar to what would be
Page 66 1 I am now showing you an enlargement of a 2 drawing that was taken from an official naval textbook 3 engineering textbook prepared during the time of World War 4 II describing the Leslie equipment. 5 You can see here the top cap, body, bottom 6 cap. Where the top cap bolts on to the body, you have two 7 pieces of metal coming together. To ensure there is no 8 leakage of any fluid or steam, you put a gasket between 9 those two pieces of metal to make sure you have got at that 10 good seal. The gaskets used here on the top cap and the 11 body come together was referred to as a copper jacketed 12 gasket. And I just so happen to have a copper jacketed 13 gasket. That is a copper jacketed gasket. 14 Copper jacketed gaskets are just what you 15 would expect. It's a copper jacket around an insert between 16 the layers of copper. For these gaskets on these pump 17 governors, the Navy design required copper jacketed gaskets 18 that had asbestos inserts between the layers of copper, 19 inside there. 20 That is one asbestos component of these pump 21 governors. 22 ATTY1: Mr. Scadden I don't think we discussed you 23 were not going to represent this container with asbestos. 24 THE COURT: Sit down. 25 ATTY1: We had a discussion. 26 THE COURT: We will discuss it later. Move on. 27 MR. SCADDEN: The copper jacketed equipment used 28 with the equipment on the Oriskany had asbestos inserts.	Page 68 1 used in one of these pump governors. And the way the 2 packing is used is where you have a metal rod or shaft 3 passing through another piece of metal and you want to have 4 a good good seal to avoid any leakage. 5 You put rings of packing around that shaft 6 and squish it down. Pack it in the space so that it expands 7 and fills the space so that nothing can leak around the 8 shaft. It would be packing similar to this that would be 9 used in the Leslie governors found on the Oriskany. 10 Leslie as you heard from some of the other 11 counsel, Leslie didn't manufacture these copper jacketed 12 gaskets. Leslie obtained the copper jacketed gaskets from 13 other suppliers who during the war years were also 14 facilities subject to the Navy control and Navy 15 specifications and these copper jacketed gaskets would be 16 fabricated at those plants where Navy inspectors would look 17 them over and verify them and allow them to be shipped to 18 Leslie where Leslie would incorporate them into their pump 19 governors again pursuant to Navy inspection and direction. 20 Same for the packing. Leslie didn't make 21 this packing. They obtained it from another vendor who was 22 a contractor with the Navy. 23 You probably noticed that you haven't heard 24 me say anything yet about insulation. The pump governors 25 provided by Leslie to the Navy were sold just as I have 26 described them. Without any insulation on them. Leslie 27 never provided any insulation on a pump governor. Leslie 28 never installed any insulation on the pump governor for the

Page 69 1 Navy. Leslie never manufactured any insulation that was put 2 on a pump governor for the Navy. 3 The insulation if any that was used on the 4 pump governors as you have heard from other counsel was 5 selected by the Navy sometime fabricated by the Navy and 6 installed by the Navy after the equipment had left Leslie's 7 plant and shipped to the ship yard somewhere across the 8 country. 9 You will hear in the testimony in this case 10 different opinions as to whether or not these pump governors 11 would even be insulated. Mr. Lowell, Captain Lowell, who 12 has extensive experience in the shipyards and with the Navy 13 has testified that in his experience these pump governors 14 were always insulated. You are going to hear from another 15 fellow named James Delaney with years and years of 16 experience in the Navy on the ships in the compartments 17 where the pump governors were used and his testimony is he 18 doesn't remember them ever being insulated. They both agree 19 that whatever insulation, if any, was used came from the 20 Navy and not from Leslie because Leslie wasn't in the 21 business of ever providing any insulation for any of these 22 pump governors. 23 We are also going to try to produce for you 24 a representative of Leslie, a gentleman named Mat Roble. 25 Mr. Roble has been with Leslie for 40 years. He is perhaps 26 the most senior fellow still at Leslie. Even he certainly 27 doesn't date back to World War II when this equipment was 28 manufactured. There is nobody at the company who dates back	Page 71 1 wouldn't provide that kind of supervision. He would provide 2 the supervise that making sure the tailers would stand watch 3 from noon to 4 were at their station. That if they had been 4 assigned to do a 6 month maintenance on a particular piece 5 of equipment they in fact did it. 6 Mr. O'Neil was not the type of fellow who 7 be leaning over the shoulder of machinist mate and saying: 8 "Watch out. Don't put that there." That wasn't his 9 experience or background. 10 Something I want to mention that I forgot, 11 going back to my drawing. One other thing that may come 12 into the discussion is flange gasket for these pump 13 governors. It's hard to tell if you are not familiar with 14 this equipment. You can see the arrows here. That is where 15 a pipe would come in to deliver the fluid to the pump 16 governor and where that pipe would meet the pump governor is 17 a flange. 18 And to make that seal tight they put a 19 gasket in there and they are called flange gaskets 20 remarkably enough. Flange on the opposite side where the 21 pipe comes to carry the fluid away. Leslie Controls did not 22 fabricate install sell or provide any of the flange gaskets 23 that were used for these governors. They were selected bite 24 Navy and they were obtained from other Navy contractors and 25 install at the Navy's direction. Whether they were asbestos 26 or not Leslie Controls didn't provide them, didn't design 27 them and didn't fabricate them and didn't install them. 28 Going back to Mr. O'Neil. It is my
Page 70 1 to World War II. It was 60 plus years ago when these 2 contracts were let. 3 Mr. Roble knows about the company and he 4 will testify on behalf of company. And he will tell you 5 that in his own experience sometimes these pieces of 6 equipment like this were insulated in the ships. Sometimes 7 they were not. It was the decision of the Navy or the ship 8 yard that was making the ship for the Navy or even the 9 skipper of the ship as to whether or not they would insulate 10 it. If they did insulate it the selection of materials and 11 the manner in which the insulation was applied was done by 12 somebody other than Leslie. 13 How does all of this tie in with Mr. O'Neil? 14 You have already heard Mr. O'Neil was an officer on the 15 Oriskany starting in 1965 and was in fact an officer on the 16 ship for about two years. The evidence will show that 17 Mr. O'Neil was not trained in college as an engineer. He 18 was not trained by the Navy or anyone else for that matter 19 as a mechanic. Didn't have any particular mechanical back 20 grounds or experience. So while it is true that Mr. O'Neil 21 supervised sailors like machinist mates who were specially 22 trained by the Navy to work on equipment like this, that 23 supervision was not at a level of telling the mechanics how 24 to do the task. You need to tighten that nut torque it down 25 to 50 pounds not 45. On that flange you got to seat the 26 surface better. That is not the kind of supervision that 27 Mr. O'Neil would provide because he doesn't flow that stuff. 28 He wasn't engineer or machinist or mechanic himself. He	Page 72 1 anticipation that there there not be any evidence describing 2 for you even one particular instance where Mr. O'Neil -- 3 where the circumstances of Mr. O'Neil's exposure to Leslie 4 equipment can be described with any specificities at all. 5 The evidence will be I believe anticipating nothing more 6 than that Mr. O'Neil was in the machinery spaces. There 7 were other sailors in the machinery spaces. There was 8 Leslie equipment in the machinery spaces. It is possible 9 that Mr. O'Neil was in the vicinity of somebody else doing 10 some work on some Leslie equipment at some time without any 11 particulars provided. 12 Another factor to bear in mind here as I 13 heard, the ship had been in service a number of years before 14 Mr. O'Neil came on board. All of the naval experts in this 15 case are going to agree that by the time Mr. O'Neil got on 16 board, whatever original gaskets and packing had come with 17 these pump governors was long gone. It had been replaced at 18 least once if not several times with whatever replacement 19 material were selected by the Navy. And installed either by 20 the Navy or at the Navy's direction. If these pump 21 governors were insulated as Captain Lowell believes but 22 Mr. Delaney disagrees, whatever insulation had initially 23 been installed on the exterior would have been long gone by 24 the time Mr. O'Neil got on board. It would have been 25 replaced at least once if not many times by other materials 26 selected by the Navy and/or their shipyards and installed by 27 the Navy and/or the Navy shipyards. 28 A minor point but let me digress just for a

Page 73 1 moment. Captain Lowell testifies that in his recollection 2 these pump governors were insulated. Even if Captain Lowell 3 says there was insulation on the pump governors, it would 4 have been on the body. Neither on the top cap nor the 5 bottom cap. The caps would have insulation on the body of 6 the governor not the top cap and not the bottom cap. There 7 is a good reason for to manipulate and adjust these pieces 8 of equipment you have to have access to the top cap and the 9 bottom cap. Both the top cap and the bottom cap have 10 moveable parts around you can't bind them up in insulation 11 to interfere with their movement. 12 Furthermore, the vast majority of any work 13 that any sailor would be doing on this piece of equipment 14 would be done to either the top cap or the bottom cap and it 15 wouldn't require a disturbance of any insulation if it was 16 even there. 17 A few more quick point. There isn't going 18 to be any evidence that any of the Leslie pump governors 19 were made improperly. No witness is going to say that one 20 of these pump governors exploded or leaked or broke or 21 malfunctioned. In isn't going to be any evidence that any 22 of these pump governors failed to meet the design the Navy 23 dictated. No one is going to say that Leslie provided 24 improper materials, made a surface too shallow, didn't 25 manufacture their equipment properly. It functioned as it 26 was designed to function and it met the design that the Navy 27 required. To a.m. my things you heard from other counsel. 28 You heard that the Navy knew about asbestos hazards at some	Page 75 1 that were on the ship at the time of Mr. O'Neil's service, 2 the risk to Mr. O'Neil of ever contracting any asbestos 3 disease would have been greatly reduced and perhaps 4 eliminated. 5 Let me restate that. If the officers on the 6 Oriskany had read the instructions that were on the ship and 7 followed them as the Navy required, the risk to Mr. O'Neil 8 would have been greatly reduced and perhaps eliminated. 9 Final quick point. You have heard about 10 warning. I know in is tough time in the afternoon. Lawyers 11 hate to be the guy to talk at this point in the afternoon. 12 Human biology it's time to take a nap. Let me finish up 13 quickly and then I will leave you alone. 14 Warnings, you have heard about the Navy's 15 knowledge of asbestos hazards and that is certainly extended 16 to any risk associated with insulation materials. That was 17 well known and the Navy had instructions not just in general 18 but on the Oriskany about dust from insulation. 19 The evidence is also going to show that at 20 the times pertinent to this case certainly in the 40s and 21 even into the 4050s and even into the 60s the evidence is 22 going to show that medical science, scientists in general 23 didn't recognize any health hazard for sailors and other 24 workers using gaskets and packing that contained asbestos. 25 This is actually from one of plaintiffs' experts doctor 26 Barry Horn. And you will hear that Dr. Horn is a man who 27 has been involved in asbestos research himself. He did some 28 research and work in the shipyards in the 70s. He has
Page 74 1 fashion at various time and issued various instructions and 2 orders as to those various hazards. Let me draw that to a 3 finer point. The evidence in this case is going to show 4 that on Navy ships in general and the Oriskany in 5 particular, it was the obligation of the officers and the 6 crew to maintain certain instructions and orders that were 7 disseminated by the Navy. And the documents are going to 8 show that the USS Oriskany was inspected several times 9 before ensign and Lieutenant O'Neil came on board and that 10 the required instructions and orders were in fact maintained 11 on the Oriskany properly. 12 And the evidence is going to show that some 13 more of these instructions and orders were actually 14 delivered to the Oriskany while Mr. O'Neil was on board. 15 And the orders and instructions I am talking to you about 16 are orders and instructions that specifically addressed 17 taking precautions regarding asbestos dust. 18 Let me state that again. Before Mr. O'Neil 19 got on the Oriskany and while Mr. O'Neil was on the 20 Oriskany, the Oriskany received orders and instructions from 21 the Navy about taking precautions with asbestos dust. The 22 naval officers are going to testify for you here I think 23 without exception are going to say it's the obligation of 24 the officers in particular on these ships to know those 25 orders, to understand those orders, and to see that they are 26 followed. And I believe the medical experts in this case 27 including plaintiffs' expert Dr. Horn will testify for you 28 that had the officers on the Oriskany followed the orders	Page 76 1 published on the issue and he has testified in many of these 2 cases over the years and he has seen patients of his own 3 with asbestos disease and he is called as an expert on 4 behalf of firms like Mr. Hart's in these cases on a regular 5 basis. And Dr. Horn has said that at the time pertinent to 6 this case in the 40s and 50s and 60s medical science didn't 7 even recognize any hazard associated with working with 8 gaskets and packing. 9 In closing I would like to thank you for 10 your time and attention there are other counsel that may 11 wish to speak to you briefly and I thank you for your 12 attention. 13 THE COURT: Thank you. Who wishes to go next? 14 MR. GILL: I will, your Honor. 15 THE COURT: You have about 12 minutes collectively 16 the defendants have 12 minutes. 17 MR. GILL: Good afternoon, ladies and gentlemen. 18 Again re gill on behalf of Crane Co. And obviously we know 19 that this is a very empathetic case and we all feel for the 20 family. As far as the facts are concerned, I just want to 21 be very clear, there are two key facts in this case. One 22 Crane Co valves did not call Mr. O'Neil's tea cease. 23 Number two, Crane Co valves were considered 24 safe at that time the time they were manufactured and sold. 25 Now, there has been some discussion about 26 what this case is all about. There has been discussion 27 about the asbestos -- 28 ALTERNATE JUROR NO. 4: Could you put the poster

Page 77 1 down? 2 MR. GILL: There has been discussion about the 3 asbestos thermal insulation in the Navy the protections that 4 were or were not taken by the Navy. As far as those 5 exposures were concerned, the scientific evidence that low 6 exposure Crysotile products which are the components of 7 gaskets and packing that were contained in the valves at 8 Crane Co had aboard the Oriskany did not cause mesothelioma 9 and that the scientific evidence is going to show that is 10 the a.m. pa bell Amosite fibers that are contained in the 11 thermal insulation that have the hypo Tennessee that cause 12 the type of disease that Mr. O'Neil contracted. 13 A little bit a brief history on Crane Co. 14 The company is 150 years old. It was founded by two 15 brothers. Richard and Charles Crane. It's a company that 16 is made up of a lot of people. You have got shippers, truck 17 drivers, valve assemblers, secretaries, a lot of people go 18 into this company in order to manufacture the valves that it 19 distributed over the years, and it made many many types of 20 valves which on a very simple level essentially just 21 controlled the flow of fluids or steam within a system of 22 pipes that are connected into a larger overall system. 23 Crane Co built valve for many businesses in 24 the industry including the U.S. Navy. Not all of Crane Co's 25 valves used asbestos gaskets and packing and the gaskets and 26 packing material that went into the valves were actually 27 manufactured by other parties and Crane Co purchased those 28 materials from the other parties and then put them into the	Page 79 1 insulation. And you can see by looking at pictures there is 2 vast difference in the make up the fibers. 3 Crysotile fiber are curly and in fact you 4 will hear that they are shorter fibers. The Amosite fiber 5 are really straight and long they look like spheres, they 6 look like dag that's right is what make them dangerous and 7 they are long. It will be undisputed the longer fiber are 8 another dangerous fiber and you will hear Dr. Brody talk 9 about that plaintiffs' expert probably later today. 10 There are vast differences between gasket 11 and packing. Let me show you some gasket and packing you 12 have seen larger valves. This is a smaller valve that was 13 manufactured by Crane Co. And the gasket material that would 14 be in some of the valves in between the bond net area here 15 it looks like this. It's just like cardboard like paper 16 it's encapsulated by the way this couldn't contain asbestos 17 none of these. And to the extent that back in the time that 18 this type of gasket contained asbestos, they were 19 encapsulated within the matrix of this cardboard. Same with 20 the packing material. It looks like rope but it's kind of 21 square. To the extent that there was asbestos in it, it was 22 inside. 23 Now, you are going to hear about the thermal 24 insulation on the mile of pipe on the Oriskany. I don't 25 think anyone has described it. You are going to see 26 pictures and you may see samples of it in this trial. And 27 generally what it looked like would be say three foot long 28 pieces kind of half moon shaped very chalky have dusty that
Page 78 1 valves that they assembled. 2 Evidence is going to show that Crane Co's 3 men and women who designed these products believed that they 4 made a good high quality and safe product. I won't show you 5 any more about valves I think you have seen enough about 6 valve. 7 Quite a number of different valve that Crane 8 Co manufactured over the years. Gate and globe valves will 9 come up in this case. 10 A few valve basic. Although we have talked 11 about packing and gaskets associated with valves, not all 12 valves use packing. They were different types of mechanical 13 seals. They would be valve that were on the Oriskany that 14 department use packing and not all valves used internal 15 gaskets. Some of them were welded together. There was no 16 need to seal the connection with any type of paper gasket or 17 otherwise. Not all valves use flange gaskets and you see 18 the valve has the flange on the ends that connect to the 19 pipes sometimes those were welded together. And not all 20 packing or gasket materials contain asbestos. That will be 21 undisputed and all of the experts will agree to that. 22 I am not going to go into some of history of 23 asbestos. Let's talk a little bit about the difference in 24 asbestos fibers. You will see on these pictures the 25 Crysotile fibers on the left are the types of fibers that 26 you are going to find in the gasket and packing material. 27 The Amosite fibers in the middle, those the 28 fibers you are going to find in the asbestos thermal	Page 80 1 piece would be put on top of a pipe and cover half of the 2 pipe. Half moon would be stuck on the bottom so the whole 3 pipe would be covered and wrapped with chicken wire. Maybe 4 asbestos-containing cement would be put on top. And that is 5 material is called fryable. This gasket is not fryable. 6 What fryable means is if you hold that 7 thermal insulation that goes around the pipes, you go to 8 crunch it with your hands and it will follow apart and there 9 will be dust in the air. In fact just hold holding that 10 asbestos insulation and moving it around very slightly you 11 will see dust release into the air. 12 Huge contrast between something like this 13 which is encapsulated. So there is a huge distinction types 14 of products that Crane Co puts inside its valves and the 15 thermal insulation which just as with the other products at 16 issue in this case Crane Co did not design insulation that 17 was put on its valves on the Oriskany. It is not supply 18 it. It -- it did not manufacture it. It did not specify 19 it. It did not require it. The Navy made the decision 20 after this valve was sold and Crane Co was out of the 21 picture selling valves to someone he will to put insulation 22 on it. The fibers that were just shown on the back picture, 23 two slides again, the Crysotile fiber on the left and the 24 Amosite in the middle, here is a summary of the differences 25 in in the properties of those fibers and explanation as to 26 why the Amosite is the hypo tenth see, the high cars genic 27 fiber that causes mesothelioma. 28 Crysotile the short and curly. The short

Page 81 1 and curly fibers Mrs. Is Crysotile fibers will break up and 2 into smaller pieces and will expel themselves from the body 3 through the body defense mechanisms. 4 The Amosite the long straight daggers they 5 get stuck in the system and they stay there and they contain 6 iron which the Crysotile fibers do not contain and this 7 makes it a very durable hard fiber that really retains in 8 the human system and does not expel itself from the body. 9 And just a last note on that and as a result 10 of these different potent cease, there will be scientific 11 evidence that basically shows that minors and the like who 12 were exposed to very very high doses of Crysotile only 13 fibers were getting mesothelioma and were developing 14 mesothelioma in very, very rare cases. So you have a 15 situation where minors are getting this disease with very, 16 very limited frequency with those such high exposures that 17 they were experiences as compared to a gasket which the 18 evidence will show and there will be studies presented in 19 this trial about the amount of fibers that were released 20 when this is worked with, there is absolutely no comparison. 21 So we have talked a little bit about safe 22 level. This ties in to the levels of Crysotile exposure 23 that would be required to cause mesothelioma and there will 24 be expert testimony which shows that it's only possible for 25 Crysotile fibers to cause mesothelioma if the exposure 26 levels are in the magnitude of 100 fiber per cc years which 27 one could never get by working with gaskets or packing 28 material for their whole life.	Page 83 1 Now you have to understand the time. 2 Asbestos was being used every where. It was very important 3 in the industriaization of many countries and obviously 4 including the United States. Everyone has indicated that it 5 was used in literally thousands of products for many many 6 decades. So when they looked at it they thought if we can 7 employ the standard of keeping the level of exposure to 8 safe levels, then we can continue to use the product. It 9 will continue to have value to society and people will not 10 get sick and will not develop diseases. 11 There was concept of latency touched upon a 12 little bit which means from the time that you are exposed to 13 asbestos to the time that you actually develop the disease, 14 it takes 20, 30, maybe 40 years and what happened is this is 15 what caused the delay in the developing knowledge as to wha 16 the safe levels of asbestos exposure were, it took them 20 17 years or so before they saw that people with exposures below 18 5 million particles per cubic feet were getting sick. 19 Because it's a dose response disease, if you are getting 20 less exposure it takes longer to get ill. Higher exposures 21 you are going to get ill quicker. 22 That is why we see we go into the second 23 wave of developing knowledge of asbestos hazard when they 24 start to look at insulators and Dr. Selikoff starts to do 25 some studies and sees that these people who are working with 26 the products that were being made by the textile workers, in 27 other words the end users are starting to develop diseases. 28 Dr. Selikoff, it will be undisputed by all
Page 82 1 And the notion is that perhaps in the 2 Crysotile there may be some trace elements, a contaminant of 3 the Amosite type fibers a fiber called tremolite which is a 4 very, very miniscule amount. Barely even noticeable. 5 Barely even determinable when you are testing Crysotile type 6 product. But if the exposures were at such a high level of 7 these 100 fibers per cc years maybe the trace elements what 8 I cause in some people very few people mesothelioma. 9 I just want to touch a little bit on state 10 of the art and the the developing knowledge of asbestos 11 hazards. Back in the 1930s and 1940s, when the inspector in 12 London that Mr. Hart talked about was looking at people who 13 were developing asbestos diseases, these were textile 14 workers. They were taking asbestos and manufacturing 15 different type of asbestos contain textile products 16 asbestos-containing blankets and the like for use in the 17 industry and the conditions they were working in again was 18 being exposed to very very high level of asbestos almost raw 19 asbestos Amosite containing fibers and they were developing 20 diseases. 21 Then what happened is the researchers 22 noticed that the people in those factories who were being 23 exposed to the super high level of exposure, those who were 24 being exposed to 5 million cubic foot or less were not 25 getting diseaseed. They thought maybe if you are not 26 exposed to level that exceed 5 million particles per cubic 27 foot then people won't get disease and asbestos can be 28 worked with safely.	Page 84 1 of the experts in this case, defense and plaintiffs, he is 2 was the most preeminent asbestos researcher of all time. He 3 dedicated his life essentially in the mid 60s to trying to 4 determine what types of diseases asbestos was causing and in 5 what trades and how it could be worked with safely of in the 6 mid 1960s he worked with thousands of insulators. He 7 studied them. He put together several different reports and 8 was published in the literature and it was at that point in 9 time that it was indicated perhaps these insulators were 10 having problem with the exposures, and that is really when 11 the focus on thermal insulation became an issue in basically 12 society. 13 Now, -- 14 THE COURT: Mr. Gill, are you ready to wrap it up? 15 Just a couple more points here. Dr. 16 Selikoff now in the mid 1960s and this is about the time 17 that Mr. O'Neil is boarding the USS Oriskany, he is for the 18 first time indicating that thermal insulation could be a 19 problem. Through 1967, which is the time period when 20 Mr. O'Neil left the Oriskany, Dr. Selikoff believed that 21 asbestos gaskets and packing were not hazardous. 22 And when plaintiffs' counsel indicates that 23 well, you know in the mid 1950s and the mid 1960s there were 24 700 article that showed that asbestos caused disease, well, 25 you have to take that into context. It's a question of what 26 were they looking at the time. They were looking at safe 27 level and you know Dr. Selikoff who is the guru of asbestos 28 research at the time, he reviewed all of the articles and he

Page 85 1 didn't say wow, this is a no brainer we have to get rid of 2 asbestos. No, he didn't say or advocate banning asbestos. 3 He said we need to investigate this. And that is what he 4 did. 5 So one cannot just say because there were 6 all of the articles out there, that everyone should have 7 known in was particular problem with asbestos and we needed 8 to do something about it at that time. The most preeminent 9 researcher said we need to investigate it and determine if 10 there are safe level and he did that and spent a lot of time 11 on it and started to work with the insulation unions and 12 what he decided what we need to do is make sure that the 13 unions and the workplace follow the safety standards of 14 trying to keep the dust levels down in line with the common 15 sense notion keep those dust levels down people breathe less 16 of the asbestos they are not going to get sick. 17 How this all kind of fits together is during 18 this period of time, there was nothing wrong with making 19 asbestos-containing products. They were in thousands of 20 products -- 21 MR. HART: Objection. It's argumentative. 22 THE COURT: Can you come to a conclusion? The 23 time has expired pursuant to the agreement between 24 plaintiffs and defendants. 25 MR. GILL: A couple more minutes, your Honor. 26 And so the products could be sold and what 27 the researchers and the doctors and the government thought 28 was the best way to handle this in the context of safe level	Page 87 1 anyone or allow anyone to discuss the case with you, not to 2 discuss the case among yourselves, and not to form any 3 opinions or come to any conclusions. 4 We will be in recess for ten minutes. 5 (Jury not present.) 6 THE COURT: Still on the record outside of the 7 presence of the jury. Let me ask counsel for the plaintiff: 8 I do have copies of the deposition of Maxwell and West I 9 don't have -- do you have the others? 10 MR. KIM: We have it prepared and it should be 11 here. 12 MR. HART: I just wanted to advise the court that 13 the next witness is Dr. Arnold Brody and I have advised 14 counsel for the defendants that he has a conflict tomorrow. 15 If they do not complete their cross-examination, he will be 16 available later in the plaintiffs' case in chief and they 17 have agreed if they don't complete today. We have another 18 witness tomorrow. 19 MR. SCULLY: One last thing for the record. It was 20 my intent on behalf of Elliott to reserve a short opening. 21 THE COURT: Well, you don't have much time. In 22 fact, you have expired -- 23 MR. SCULLY: Thank you. 24 THE COURT: -- all of your time but I will allow 25 you to take one or two minutes and the same thing with 26 Mr. Wallace. Very brief one or two minutes. Counsel had 27 agreed hour and a half and defendants surpassed that. 28 MR. KIM: Couple of minor housekeeping points, the
Page 86 1 of asbestos exposure is who controls that the best? Well, 2 it's the workplace. It's the employer, it's the Navy. They 3 are the ones who can provide ventilation if there are dust 4 level that. 5 MR. HART: Objection, this is argumentative. 6 THE COURT: Objection sustained. Anything further, 7 Mr. Gill? 8 MR. GILL: Just a couple of last points. The 9 notion was that the employers could have the ability to keep 10 those. 11 THE COURT: The objection was sustained to any 12 argument. 13 MR. GILL: Okay, your Honor. 14 I will end by saying what the evidence will 15 show again in the context of the safe level and the 5 16 million particles per cubic foot that any exposures from 17 gaskets or packing were always well below those threshold 18 limit values and were all below the safe levels of exposure 19 at the time and that is really the key here. 20 Thank you. 21 THE COURT: Thank you. That concludes our opening 22 statements from counsel. 23 The next stage of the trial will be the 24 presentation of evidence. What we will do is we will take a 25 ten-minute recess so parties, clients lawyers can set up and 26 then we will begin the testimony. 27 At this time I will admonish the jury let me 28 remind the jury once again not to discuss the case with	Page 88 1 ex parte on the pro hac vice, would the court like to do 2 that at the end of the day or do it now and a second issue, 3 your Honor, is I believe I would like to resubmit an amended 4 exhibit list. The exhibits are the same but they have been 5 renumbered. A lot of the defendants have premarked exhibits 6 and have exhibit numbers that they have premarked and so we 7 just tried to accommodate those numbers so we have to amend 8 the list that we would like to submit. 9 THE COURT: Okay, there is Mr. Oliver. There are 10 not enough attorneys here we need more? 11 MR. KIM: We need more from Texas I think. 12 MR. HART: We are out numbered. 13 THE COURT: I will take a look at it and review it 14 later. We will be in recess for ten minute. 15 (Recess.) 16 THE COURT: Good afternoon. Back on the record in 17 the case of O'Neil versus Buffalo pumps. All members of the 18 jury are present and seated. Everyone have their afternoon 19 sugar fix. 20 All counsel present. Plaintiff ready to 21 call your first witness? 22 MR. HART: Plaintiff calls Dr. Arnold Brody to the 23 stand. 24 + DIRECT EXAMINATION 25 MR. HART: 26 Q. BY MR. HART: Dr. Brody, would you please 27 introduce yourself to the ladies and gentlemen of the jury? 28 THE COURT: He already did. Next question.

Page 89 1 Q. You are a doctor, is that correct? 2 A. I am a PhD. 3 Q. And what is your field of specialty, sir? 4 THE COURT: Just a second. May I ask the clerk to 5 distribute the notebooks? 6 THE COURT: You may proceed. 7 Q. Dr. Brody, what is your field of specialty, 8 sir? 9 A. It's called cell biology. 10 Q. First of all, you said you practice 11 pathology, is that correct? 12 A. Experimental pathology. Study of disease, 13 pathology. 14 Q. And you have a doctorate in that area, is 15 that correct. 16 A. That's right. 17 Q. And Dr. Brody, have you conducted research 18 concerning asbestos and how asbestos causes disease 19 including mesothelioma? 20 A. For decades, yes, sir. 21 Q. And are you here today to testify about your 22 research to this jury? 23 A. That's right. 24 Q. And before we get into that, let me get some 25 information about your background r, please sir. Where do 26 you live? 27 A. In Raleigh, North Carolina. 28 Q. What is -- your position in Raleigh?	Page 91 1 study of diseases caused by asbestos? 2 A. Since the middle 70s. 3 Q. And let me go back to your education. Can 4 you give us a brief overview of your education? 5 A. After high school in New Hampshire, I went 6 out to Colorado to do a Bachelor of Science degree in 7 zoology. That is the study of animals. Then I went to the 8 University of Illinois where I received a master of science 9 degree in anatomy. Human anatomy and animal anatomy, how 10 the parts are put together. 11 Then I went back to Colorado to do the PhD 12 the doctorate in cell biology as I described. Then three 13 years of post doctoral study at Ohio State University. 14 Q. And what was the post doctoral study in? 15 A. That is really where I started interest in 16 lung disease, allergies, and asthma and that sort of thing. 17 Q. And, doctor, can you give us an overview of 18 your work experience before moving to North Carolina? 19 A. So post doc at Ohio state, I did -- I 20 accepted what is called an assistant professor position. 21 That was a beginning professor in the pathology department 22 at the University of Vermont. That was in the medical 23 school and I was there for six years. That is again where I 24 started studying asbestos disease. 25 Q. Excuse me. Earlier you developed an 26 interest in lung pathology or how the lung is made up and 27 then when you went to Vermont and you began focusing on 28 asbestos in the lungs, is that correct?
Page 90 1 A. I am a professor in the department of 2 molecular biomedical sciences at North Carolina State 3 University. 4 Q. What does that mean? 5 A. Biomedical means the biology of medicine. 6 Medicine you understand. Biology is the way it works and 7 biomedical sciences deal with how diseases develop and we 8 say molecular, that means at the genetic level. What is it 9 about our genes that drive disease. 10 Q. And can you give us just an overview of the 11 type of work you do on a day in and day out basis please 12 sir? 13 A. Yes, right now we are trying to understand 14 the genes that control various lung diseases like scar 15 tissue formation, certain cancers including mesothelioma, we 16 have -- we work with cells, we work with animal models and 17 of course the idea is to understand human disease so we are 18 working with human stem cells. They are called umbilical 19 cord stem cells and stem cell derived from umbilical cord 20 blood from people and we are trying to use those cells to 21 develop treatments for these diseases where currently there 22 is no such treatment. 23 Q. Does some of your research deal with 24 diseases caused by asbestos? 25 A. Exactly. That is what the National 26 Institutes of Health supports my work to understand -- 27 the -- very many of asbestos induced diseases. 28 Q. And how long have you been engaged in the	Page 92 1 A. Right. Because I worked with Dr. Wagner. I 2 don't know if you heard about Dr. Wagner yet. 3 Q. Not yet. 4 A. I met Dr. Wagner and worked with him and he 5 introduced me to these diseases and then I was there at 6 Vermont for six years and accepted a position at the 7 National Institutes of Health and I was the head of the lung 8 pathology laboratory for 15 years at the national institute 9 of environmental health sciences. Following that, 15 years, 10 in 1993, I accepted a position as a full professor at the 11 Tulane university medical school in New Orleans and I was a 12 professor there and then I was promoted to vice chairman of 13 the department so I was vice chairman of the pathology 14 department in the medical school at Tulane university for 13 15 years. 16 We had this little storm called Katrina and 17 Katrina changed my life there as well as a lot of others and 18 so right after that, I accepted a position at North Carolina 19 State University where I currently am. 20 Q. Now, you mentioned Dr. Wagner, tell the 21 ladies and gentlemen of the jury who he is and who he was 22 excuse me -- and how he affected your study on asbestos? 23 A. In 1974, Dr. Wagner came to very visit the 24 University of Vermont. He had discovered in 1960 that 25 asbestos causes mesothelioma. This cancer I know you have 26 heard about mesothelioma. 27 He saw the work that I was doing using what 28 is called an electron microscope. This is a kind of

Page 93 1 microscope that I was using that allows investigators to 2 magnify things hundredsd of thousands of times. He had 3 developed an animal model of asbestos disease. And he asked 4 me if I would be interested in coming and working with him 5 Wales, the United Kingdom, which is where he was at time and 6 developing this model system; and of course I thought that 7 was fantastic idea and did that and that was really my 8 introduction to asbestos disease. 9 Q. And you worked with Dr. Wagner for how long? 10 A. It was for summers, about 8 weeks. 11 Q. Now, you mentioned that you were employed at 12 the National Institutes and Environmental Health Sciences, 13 correct? 14 A. That's right. 15 Q. What is that institute? 16 A. So that is one of the 15 or so National 17 Institutes of Health. You may have heard of the National 18 Cancer Institute. National Heart, Lung, and Blood 19 Institute. National institute of allergies and infectious 20 disease. These are all institutes that make up this 21 government agency known as the National Institutes of Health 22 and they are dedicated to learning sufficient -- 23 sufficiently about the diseases to be able to treat them. 24 Q. Is that a branch of our government that is 25 dedicated towards science? 26 A. Exactly. 27 Q. And your position there was the director of 28 pathology?	Page 95 1 Q. Teaching at universities? 2 A. That's right. In the medical school and 3 also graduate students and medical doctors, sure. 4 Q. And after Tulane you went to North Carolina? 5 A. That's right I am currently in North 6 Carolina State University. 7 Q. Are you involved with the medical school 8 there? 9 A. So at North Carolina State University, we 10 have a vetinary school and I also regularly associated and 11 work with the medical school at University of North Carolina 12 and Duke university, but we have this concept in medicine 13 called one medicine. What is good for your dog and cat is 14 good for us. In other words the medicine is very much the 15 same. 16 Q. And is that why sometimes animals are used 17 for experiments rather than -- helpful in experiments in 18 finding out information about human and human disease? 19 A. Sure. You have to absolutely right. I and 20 thousands of other scientists around the country use animal 21 models of human disease. Now, we have to prove to the 22 scientific community that we have a model that teaches us 23 about human disease, because not everyone one, not all of 24 the models do that, but if you have one that does, then you 25 can prove to the scientific community that it helps then 26 sure. 27 Q. Doctor, have you had occasions to present 28 the results of your research to the scientific community for
Page 94 1 A. No I was the head of the lung pathology 2 laboratory. 3 Q. Now, you mention the earlier P M.D., are you 4 medical doctor? 5 A. No. 6 Q. How did you get to be head of that 7 laboratory of pathology if you are not a medical doctor? 8 A. The same question could be asked how do you 9 get to be the vice chairman of pathology department in the 10 medical school and the answer is that it's not unusual for 11 PhDs to be professor in medical schools. Go to any -- I am 12 going to USC tomorrow to give a talk in the department of 13 pull money and critical care medicine and they have. 14 Q. That is the school of medicine here? 15 A. That's right. And they have a number of 16 PhDs in their department just as I was and we teach the 17 basic sciences to the medical students before they go into 18 their clinical sciences and things, they need to do bio 19 chemistry it's not that usual for a PhD to be vice chair of 20 a department, but that is what I was. 21 Q. That is what you were in Tulane? 22 A. That's right. That's right. 23 Q. And you were vice chairman over the 24 Department in the medical school in Tulane, is that right? 25 A. That's correct. 26 Q. And during your professional career, have 27 you been involved in teaching? 28 A. That's right. Regularly, sure.	Page 96 1 them to evaluate? 2 A. Many times. 3 Q. And how do you normally do that? 4 A. There are a couple ways. The most important 5 way is to publish your work in the open medical literature. 6 And that is called the peer review science. 7 Q. What does that mean, peer review? 8 A. So that means if I do a series of experiment 9 in my laboratory and I think it's that work is ready for 10 anybody to read, I put together a manuscript, a paper and 11 send it to the editor of one of 25 or so different bio 12 medical journals. You can only send it to one at a time. 13 And that journal -- then the editor of that journal sends my 14 paper to two or three or four of my peers, other scientists 15 anonymously to review my work and they pass judgment on the 16 work and send a written review back to the editor. And then 17 the editor decides whether or not it needs more work, needs 18 further writing needs more experiments. And then finally 19 when that paper finally appears, if it does, then that is 20 called the peer reviewed literature. 21 Q. And what is the purpose of publishing the 22 research in peer reviewed literature? 23 A. Well, that is the way you provide new 24 information to the world's literature. In other words, you 25 don't get to redo just what somebody else has done. You 26 have to advance our understanding of a disease process. And 27 that is the idea of this work. 28 Q. Okay, and does publication of your article

Page 97 1 allow other scientists to check your research and try to if 2 they want to replicate it to see if they can reach the same 3 result with your methods? 4 A. Exactly. Not just to replicate it but to 5 advance beyond that. If you are just replicating someone 6 else's work it's probably not going to be accepted. But you 7 can replicate part of it and then advance beyond what I have 8 done or I do the same thing. I know what other people have 9 done in the literature and I work beyond that. 10 Q. And now, during your career, where has most 11 of the funding for your research come from? 12 A. It's all come from the National Institutes 13 of Health. And in a very competitive process. 14 Q. And how do you obtain your funds for the 15 research that you are conducting? 16 A. I have to write what are called grant 17 applications. I put an application in along with the tens 18 of thousands of other scientists across this country and so 19 I compete with the great scientists at USC and northern 20 California and Texas and Boston and everybody else across 21 the country and about 10 to 15 percent of the applications 22 are funded. And so when I say competitive, that is what I 23 mean. It's a very competitive process. 24 Q. I forgot to ask a moment ago. You mentioned 25 that you had result of your research published for other 26 scientists to review. How many times have you had that 27 done? 28 A. I have 146 peer reviewed papers. I have	Page 99 1 obviously knew that asbestos caused disease and it causes 2 asbestosis, scar tissue in the lung, lung cancer and of 3 course mesothelioma as we have heard. 4 So we knew that, but when I asked a simple 5 question where does the asbestos go when it gets in the 6 lung. We know it goes into the lung but where does it go? 7 Where does it land in the lung? How does it injure lung 8 cells? What are the mechanisms through which it can move 9 through the lung? These are questions that were not 10 answered so I started considering those question. 11 After those questions were answered we asked 12 questions what are the factors, what are chemicals in the 13 body that can control cell growth? Cell growth is 14 important to the disease asbestosis and to cancer and then 15 finally in the last ten years or so we are very interested 16 in the genes -- which genes control these disease process. 17 Q. Doctor, from time to time are you invited to 18 come present talks at scientific gatherings? 19 A. Many times. 20 Q. And what types of scientific groups have 21 asked you to come speak to them? 22 A. Let's start with tomorrow. I have been 23 asked by the department of pulmonary medicine which is of 24 course lung disease, pulmonary and critical care medicine 25 USC to give a talk and I expect in that audience to be 26 physicians, scientists physcains, graduate students, 27 doctors, people who are interested in lung disease. That is 28 sort of typical.
Page 98 1 also 50 book chapters and proceedings. And you also asked 2 me why we do that. I mean, I couldn't compete for those 3 grants unless I published my work in the open medical 4 literature for everybody to see. 5 Q. So one of the things that the government 6 wants you and other researchers to do with their research is 7 to publish it and share it with everyone? 8 A. That is a requirement. Absolutely. 9 Q. You have done that over 140 times? 10 A. I have. 11 Q. And what is the difference about the book 12 chapters? Tell us about that please? What are they 13 designed for? 14 A. Well, these are invited reviews. In other 15 words somebody is writing a book for example and they want a 16 chapter on asbestos disease and which I have done many times 17 and submit that. And it's a review of my work and others. 18 Q. Are these books ones that are used by 19 medical student to teach medical students? 20 A. Used in medical schools, graduate schools 21 and other sites. 22 Q. And are they used to teach scientists who 23 are not doctors, right? 24 A. That's correct. 25 Q. Tell us some -- if you can just very general 26 term some of the topics that you have researched over the 27 years that deal with asbestos and asbestos disease? 28 A. When I started my work with Dr. Wagner we	Page 100 1 And then I have been asked to give talks at 2 various meetings in countries and states around the world. 3 Q. So you have actually traveled around the 4 world at the request of scientific groups to lecture them? 5 A. Many times. I was visiting professor at 6 medical college of Beijing a couple of years ago. I gave a 7 talk last Christmas at Lutven in Belgium. I have been to 8 many different countries. 9 Q. And all of this relates to your study of 10 asbestos and asbestos disease? 11 A. Right. Tomorrow I will talk about the 12 genetics that control the development of abnormal cell 13 growth. 14 Q. And when you give these talks to scientists 15 and doctors and these other groups, do you employ slides to 16 assist you? 17 A. Always. 18 Q. And do you have some of those slides today 19 to show to the jury later on in your testimony? 20 A. Some of those very slides that I will use 21 tomorrow at USC, that is correct. 22 Q. And before we get there, let me ask you 23 this: Have you ever been asked to sit on the panel to 24 review articles that others have written before they are 25 published in journals? 26 A. Many times. 27 Q. And do you presently serve on any such 28 panel?

Page 101 1 A. Yes, I do. I am on the editor on the board 2 of the American Journal of Respiratory and Cell Molecular 3 Biology and the American Journal of Pathology and a number 4 of others. I have a paper in my briefcase from that journal 5 that they have asked me to review. 6 Q. Doctor, during your career have you received 7 honors as a result of your research? 8 A. Yes, I have. 9 Q. Can you describe some of those to the ladies 10 and gentlemen of the jury? 11 A. Well, the largest honor actually is 12 receiving support from the National Institutes of Health 13 because it's so difficult to get that kind of support, I 14 consider that an honor to be supported by the National 15 Institutes of Health. 16 I also have received a traveling fellowship 17 award from Burroughs welcome company to go to other 18 universities and present my work. 19 Q. Doctor, have you studied the -- you said you 20 studied the mechanism of how asbestos causes disease, is 21 that correct? 22 A. That's right. 23 Q. And your Honor, at this time we would like 24 to offer Dr. Brody as an expert in that field. 25 THE COURT: Okay. Next question. 26 Q. BY MR. HART: Thank you. 27 Your Honor, may I approach and use the 28 easel?	Page 103 1 their lung over time and so what they receive then is a 2 cumulative dose. 3 Q. And what role does this play in the disease 4 a person may develop particularly with respect to 5 mesothelioma? 6 A. Particularly a person is exposed over their 7 history to a number of different sites. Whatever their 8 exposure. And whatever that site, that site can offer and 9 be a place of exposure. Whatever that site is, that is part 10 of the cumulative exposure. 11 Q. And have some of the research you have done 12 looked at disease and how it relates to cumulative dose? 13 A. Right. We have done a number of studies 14 showing how asbestos fibers accumulate in the lung over 15 time. 16 Q. And we will get to some of those slides in a 17 moment I will come back to that. 18 Let me ask you about the types of asbestos. 19 Are you familiar with? 20 Q. Cryotile Amosite and Crocidolite. Are you 21 familiar with those types of asbestos. 22 A. Yes. 23 Q. Have you done research concerning some or 24 all of those? 25 A. All of those. 26 Q. And according to your research are all of 27 these capable of causing mesothelioma in human beings? 28 A. So I have done kinds of experiments with --
Page 102 1 THE COURT: Yes. 2 Q. And may I just set this down, the 3 instructions here? 4 THE COURT: Yes. 5 Q. Let me can you a couple of things about 6 asbestos and asbestos disease, and if you feel at any time 7 that you can draw or write better than me, please feel free 8 to take over here. 9 I want to ask you some questions about some 10 terms as they relate to asbestos disease. Are you familiar 11 with the term latency? 12 A. Sure. 13 Q. What does that mean? 14 A. That is the time from first exposure, from 15 the time the person was first exposed to the time they came 16 to the clinic with their presentation of their disease. 17 Q. And how do that play a role in asbestos 18 disease particularly mesothelioma? 19 A. Well, mesothelioma can have quite a variable 20 latency, but typically it's around 30 years. It could be 20 21 years. It could be 50 years. But it's usually been that 20 22 to 50 year period. 23 Q. Are you familiar with the term cumulative 24 dose? 25 A. Cumulative dose means that as a person is 26 exposed, whatever they are exposed to is their dose. And as 27 they are exposed, wherever they are exposed, that 28 accumulate. Some proportion of that dose accumulates in	Page 104 1 MR. WALLACE: Objection, your Honor. The question 2 calls for a yes or no answer. 3 THE COURT: You may answer yes or no and then 4 explain your answer. 5 THE WITNESS: No the kinds of experiments I have 6 done don't establish whether or not a specific asbestos type 7 cautions mesothelioma. I have studied the process through 8 which these fibers get into the lung and cause changes in 9 the lung that can lead to mesothelioma. 10 Q. As a result of your studies, have you 11 arrived at your opinion concerning whether your studies or 12 your own research and your investigation elsewhere, whether 13 or not these three types can cause mesothelioma? 14 A. Yes. 15 Q. And can they? 16 A. Yes, it is my opinion all three of those 17 fiber types can get to the site and cause the genetic errors 18 that can cause the production of mesothelioma. 19 Q. Have you done research on studying those 20 mechanisms for each of those fiber types? 21 A. So Cryotile is the one that I have done 22 most of my work with. I have done some studies with Amosite 23 and Crocidolite but it's Cryotile that I have done most of 24 my work with. 25 Q. In the United States what has been the 26 predominant form of asbestos that has been used when abestos 27 was used in the 1900s? 28 MR. WALLACE: Objection, your Honor. Overly broad.

Page 105 1 lacks foundation. 2 THE COURT: Overruled. 3 THE WITNESS: Crysotile is the fiber used most. 4 About 95 percent of all of the asbestos used in the world is 5 Crysotile. That is one of the reasons I typically use 6 Crysotile. 7 Q. What was that percentage? 8 A. About 95 percent. 9 Q. Now, your Honor, may we show the jury the 10 slides that the doctor has brought? 11 THE COURT: Have you shared them with defendants? 12 MR. HART: Yes, your Honor, we have. 13 THE COURT: Any objection. 14 MR. MOLLAND: No objection here 15 Q. Doctor, do you have the slides to discuss 16 your research please, sir? 17 A. I do. 18 Q. What -- and again these are slides you use 19 when you give talks at other scientific groups and doctors 20 and scientists, correct? 21 A. That's right. Some of them. Of course I 22 will add some more slides about the current genetics when I 23 talk tomorrow but this is the basic talk, sure. 24 May I stand, your Honor? 25 THE COURT: All right. 26 MR. WALLACE: Your Honor, there is no question 27 pending. 28 MR. HART: I haven't had a chance, sir.	Page 107 1 see running around the lung that presence the pleura. 2 P-L-E-U-R-A. Very thin membrane. Saran thin membrane. 3 Wrapped around the outside of the lungs and makes the lungs 4 air tight and that is where mesothelioma develops. 5 Q. Can you give us the idea of the size of the 6 fibers that reach this area of the exterior of the lung and 7 the pleura? 8 A. We will see them in just a minute, but I 9 mean, they are well below what you can see with the naked 10 eye. They are tenths, hundredths of millimeters. We will 11 see a picture and their sizes in just a minute. 12 Q. What is your next slide sir? 13 A. These diagrams are useful but it's very good 14 to be able to see what these things actually look like, so 15 to do that I use what is called an electron microscope. 16 This is the electron microscope I had in my laboratory right 17 up through Katrina. This microscope was a victim of the the 18 hurricane. You can see I had it for a long time by the gray 19 in my hair. 20 I can take a period at the end of the 21 sentence or a structure as big of this device I am holding 22 and put that tissue in to this door right here, an electrons 23 come down from the top of the chamber. Inside the chamber 24 there is a vacuum and it strikes that sample and then in 25 front of me, there is an image, electron image which is 26 re-creation of whatever I have put in the door and then just 27 off the screen is a camera so I can take a permanent image 28 of what is it is I am looking at.
Page 106 1 Q. What does this slide represent, doctor? 2 A. So obviously this is a diagram and you can 3 see that -- 4 THE COURT: Mr. Wallace, I suggest you move out of 5 the way unless you want to get a beam of a laser. 6 Thank you. 7 MR. WALLACE: Certainly, your Honor. Is this all 8 right? 9 THE COURT: If you want to be in the way of the 10 laser light. 11 Go ahead. 12 Go ahead, sir. 13 A. So obviously this is a diagram and you can 14 see where your lungs are sitting in the chest and when you 15 take a breath, the air comes down this tube that we call the 16 trachea and you can feel the top of the trachea in the Adams 17 apple. That is the top of the trachea or your windpipe and 18 the air gets carried down into the tubes that we call 19 conducting airways because they conduct air down into the 20 lung. 21 Q. And is this where the asbestos fibers go? 22 A. That is right. 23 Q. When they are breathed in? 24 A. They go all throughout the respiratory 25 tract. Some of them get caught up in the nose and the back 26 of your mouth and some of them get caught in the tubes. But 27 the ones that cause mesothelioma can get all of way out to 28 the edges of the lung and that is this black line that you	Page 108 1 So, for example, if I cut a piece of tissue 2 out of the lung, and you can see this tissue where the 3 pleura runs over the top and the airways run up and I take a 4 picture of that. You can see what your lung looks like. It 5 looks like a big sponge. Here the airways running up to the 6 lung and the thin pleura that runs outside of the lung. 7 The airways conduct air out into the gas 8 exchange where we exchange oxygen and carbon dioxide and the 9 diseases that develop in the lung, you can see asbestosis 10 develops out in the gas exchange area. 11 Q. Mesothelioma develops in the mesothelial 12 cells that line the outside of the lung, doctor, and 13 asbestosis is scarring inside the lung? 14 A. That's right. 15 Q. And mesothelioma is the cancer outside the 16 lung? 17 A. On the outside of the lining of the lung. 18 Q. Both of those diseases are caused by 19 abestos? 20 A. That's correct. 21 Q. So I want to go on -- 22 A. I want to show you couple of defense 23 mechanisms. We have very good defenses against the dust and 24 particles and bacteria and things we face every day. And 25 the defense mechanisms start in the back of your throat and 26 run all of the way down into your lungs. And we have a very 27 important defense mechanism that lines our airways and I am 28 going to show you that by focusing the microscope right down

Page 109 1 on the surface of this airway and I am going to fill the 2 screen with what is in this red spot. And so I am going to 3 take a picture. It could be anywhere along our airways. I 4 am going to focus the microscope and take a picture and is 5 that what it looks like. 6 And you see -- 7 Q. What does it show you? 8 A. You can see this says human bronchial. 9 Bronchial is a small airway and our airways are lined by 10 these little hair like structures. They are not really 11 hairs. They are extensions of the cell surface and they 12 move in a synchronous like fashion. So if something lands on 13 the surface of our airways it gets swept up to our mouth 14 where we can swallow it or spit it out. 15 Some of these cells have cilia and some of 16 these cells outline through here, some of them make mucus 17 and so this culmination of mucous cushion and cilia we call 18 the mucocilliary escalator because it escalates up to the 19 mouth. 20 Q. Those things that look like hairs are 21 actually portions of cells? 22 A. Extension of the cell surface and this is 23 human bronchial but rats and mice and guinea pigs and dogs 24 and cats all have those very same structures on the surface 25 of their airways. 26 So that surface then covers all of our 27 airways. 28 Down in the lower right-hand corner you can	Page 111 1 airway because this is where the asbestos fibers land when 2 they go past the escalator. Many of them just go flying 3 right past the escalator. Asbestos fibers line up in the 4 flow of air and go right past the escalator and land down in 5 the gas exchange surface. So I want you to see what that 6 looks like and so we can then follow this marker right out 7 to the end of the airway which is here. The end of the 8 airway where it opens out into the gas exchange area. 9 Q. This is an enlargement of the outer 10 portion of that earlier pictured lung? 11 A. That's right. We have been looking out here 12 and now I am focusing the microscope into this area right 13 here and there we are and you can see a few of the 14 thousands -- hundreds of millions of air space that we have. 15 This is a 100 micron bar and you can see our lung is made up 16 of these little air spaces you can think of as individual 17 room if you like. Sort of like this courtroom. And if you 18 look down on the courtroom floor you see a carpet that runs 19 along the courtroom floor and that is very much like our air 20 space where we have a kinds of cell that covers the floor 21 and actually goes up over the walls into the next air space 22 as well. 23 And those cells, those carpet cells, we can 24 see in the next picture because I am going to focus the 25 microscope right down on the floor of a single human air 26 space. 27 Q. You are going to zoom in? 28 A. I am going to zoom in on one of the air
Page 110 1 see a size marker because you were asking me how big and 2 small these things are. You will see on the micrographs on 3 the pictures, there are size markers so that we can always 4 tell how big and small these things are. 5 Q. That is your point of reference? 6 A. Right. That is our point of reference to 7 know. For example this bar that you can see here is 10 8 microns long. It's easy for you to see 10 microns because 9 this a magnified many thousands of time. But the question 10 is how big is a micron. I can tell you that if you take 11 your thumb and forefinger and make a little space that you 12 can just barely see with your naked eye, you have made just 13 about one millimeter. Now take that millimeter and divide 14 it one thousand times. So now what you have done is you 15 have made one thousand microns. So you can fit one thousand 16 microns into this millimeter and that means you can barely 17 see with your naked eye 1,000 microns. 18 Now with the electron microscope that's easy 19 to see 10 microns. Of course can't see that with your naked 20 eye. And that is as we go through these structures you will 21 be able to see how big and small these things are. 22 Q. If something was floating in the air 10 23 microns long and thin like that line, you would not be able 24 to see it? 25 A. Not at all. Not even close. You can barely 26 see a thousand microns. 27 So now we are going to go past this 28 microcilliary escalator and go out in the gas exchange	Page 112 1 spaces and look down on the carpet and there we are and here 2 we are looking down on the carpet and you see this that I am 3 outlining for you here, that is a single human carpet cell. 4 Of course we have a name for that scientists name 5 everything. And we call this an epithelial cell. Epithelial 6 cells cover surfaces. So if you are looking down on the 7 carpet that covers the floor of our air space, we are 8 looking at these epithelial cells. 9 Q. Now, I am outlining this one cell sort of 10 like -- think of it it sort like carpet square. Nature 11 doesn't like square. Nature makes smooth surfaces and it's 12 next to another big oddly shaped cell and those are tightly 13 fit from one side of the cell to the other side of the cell 14 is about 40 microns. 15 Q. So you don't -- obviously you can't see your 16 individual cell that cover your surfaces of your air space? 17 A. There are some smaller cells that have bumps 18 all over them. Those cells are actually the mother cells of 19 these big flat ones. If the big flat cells are injured by 20 asbestos or infection or for whatever reason, these smaller 21 cells start to grow and take their place. So we have this 22 very effective very important repair mechanism in all of our 23 air space. 24 I have one more line of defense I want to 25 show you and to do that I am going to focus the microscope 26 down on the carpet. Remember the cell with the bumps all 27 over it and now I am going to focus you -- the microscope 28 down here and there is the cell with the bumps all over it.

Page 113 1 So you can see, I focused the microscope right down on the 2 carpet. Here is the carpet and here is the cell with the 3 bumps and there are two other actors. There is this one 4 that is sitting ruffled not going anywhere and there is this 5 cell with the tail end and a front end and this cell was 6 moving in this direction when I caught it in the act. And 7 these cells right here are called macrophages. Macro mean 8 big and phage means eater. They are the big eaters of the 9 lung. They patrol our air space surfaces and they can 10 detect particles that don't belong our our air space 11 surface. 12 So this air space once belonged to a person 13 who was killed in a motorcycle accident. I was on the 14 medical examiner's autopsy call and I went down and prepared 15 this person's lung so we could look at it. When I was 16 looking through the air space I saw these two cells. This 17 one and this one going after this pollen grain right here. 18 And so this cell was in the act of crawling towards this 19 pollen grain and was going to ingest the pollen grain and 20 digest it and carry the debris up on to the escalator. And 21 every time you swallow, in fact you swallow a few of your 22 friends, these macrophages because they are constantly 23 searching for things that don't belong in our air space 24 surface. We swallow them and that is what you are supposed 25 to do. 26 Off course when asbestos lands in the sites 27 they find asbestos and we actually discovered in my 28 laboratory the chemical signal that attracts macrophages to	Page 115 1 well. 2 So what I did was I had the animal model -- 3 we know that Dr. Wagner showed that rats when exposed to 4 asbestos get all of the diseases that people get. So I was 5 able to use this animal as a model to find where the fibers 6 go and find out how they injure lungs. 7 Q. All right, now doctor, you said asbestos 8 fractures and makes tinier fibers. Is asbestos an unusual 9 mineral in that respect? 10 A. It is, sure. 11 So here we are now. Now we are in the lung 12 of a rat. And I know it looks the same as I was showing you 13 as the lungs of human. If a rat or mouse went running by 14 here right now, he would be doing exactly what you are 15 doing, inhaling and exhaling the room air using the same 16 structures that we have been talking about. 17 And here you can see the end of the airway 18 where it opens out into the gas exchange area. And I have 19 exposed this particular animal to a single hour of Crysofile 20 asbestos and then after the hour was over I took the animals 21 out and gave them an overdose of anesthetic and of course 22 they don't wake up from the overdose and I prepare the lungs 23 as I have just shown you and I can then if I see the 24 asbestos in the lung, I know when it got there. It got 25 there during that hour of exposure. That is the only way it 26 can get there. And then if I look at the animal hours 27 later, days later, week later, month later, year later, I 28 can follow that process of what the asbestos is actually
Page 114 1 asbestos fibers. 2 Q. So all of these -- that hairy thing we 3 showed earlier, you showed us earlier part of that 4 mucocilliary escalator, the particle fibers or particle 5 cells and macrophages all help protect the body from things 6 that invade the lungs? 7 A. Absolutely they are a very effective defense 8 mechanisms that can eliminate over 90 percent of whatever we 9 are exposed to. That is correct. 10 Q. All right, what is this slide? 11 A. Now you have seen all the cells that you 12 need to know or to see or understand what happens when 13 asbestos gets in the air so we can talk about asbestos. And 14 you can see now that this says Crysofile asbestos fiber 15 bundles. You asked me about the asbestos varieties. This 16 is what Crysofile look like. 17 Here is the size marker to answer your 18 question how big these fibers can be or how small. There is 19 a 1 micron bar which you can easily see at a magnification 20 of 4,300 times. 21 Now you can see if you lay this bar along 22 side the fibers, you can see that some of them may be 23 hundreds of microns long, some of them 5 or 6 microns long. 24 Some of them extremely thin. Tenths of one micron. That is 25 the point that asbestos can reach huge variability in size 26 and shape. Infinite variety of sizes and shapes. And it's 27 constantly breaking down. Fibers not only fracture off of 28 these bundles outside of the lung but inside the lung as	Page 116 1 doing to the lung. 2 Q. And doctor, have you found that the action 3 of asbestos on the rat and -- is it rat lungs here? 4 A. This is -- we have used rats and mice. 5 Q. Rat and mice lungs are similar to the action 6 of asbestos on human lungs? 7 A. You don't get to follow it in people. That 8 is the thing. By the time the person comes to the clinic 9 decades later, you don't get to see what is going on in the 10 lungs. So that is why we use the animal models. 11 The question is does the disease develop in 12 the animals from the same cells as it does in people in the 13 same sites. In the same anatomic spots. The answer is yes 14 And that means we can use them as models. 15 Q. Okay? 16 A. So here now in this particular animal I am 17 going to take a picture of this spot right here immediately 18 after this single hour of exposure and I am going to focus 19 the microscope right here and take this picture right here 20 and now you can see sitting on the carpet cells. There are 21 the carpet cells down here in the air space. You can see 22 sort of a short asbestos fiber here. This is 10 micron bar. 23 So that means this fiber is about 10 micron long some of 24 them are shorter. Some of them are longer. Some of them 25 are straight and some of them curled. That is the point you 26 saw earlier when I showed you the fiber. Now they are 27 sitting on the carpet of this animal's lung. The lung. 28 What I found was the carpet cells respond

Page 117 1 very quickly to the presence of asbestos. They actually 2 come over the top of the fibers and you can see some of that 3 happening right here and the fibers disappear from view. 4 They disappear from view within that first hour of exposure 5 and they get shoved under the carpet. 6 Now, I don't know if you heard about 7 background asbestos. 8 Q. We haven't heard. You are the first witness 9 in the case, doctor. 10 A. So we all are exposed to a little bit of 11 asbestos every day. A few fibers floating around in the 12 air. And so as a result, we all have some asbestos in our 13 lungs. Not enough to cause disease, but enough so that if 14 you measured it as we have, you can find some asbestos -- a 15 little bit of asbestos in everybody. And that little bit of 16 asbestos is sitting under our carpet cells. And the way it 17 got there was by being inhaled and going back past the 18 escalator landing on the carpet getting picked up and shoved 19 under the carpet. And that is what you expect and that is 20 normal and that is what you see in just about everybody's 21 lungs. 22 Now, when it happens in sufficient numbers 23 to cause disease, then that is the process that we are 24 trying to understand, we are trying to follow. If it 25 happens in sufficient numbers for mesothelioma, that means 26 that some proportion of those fibers that got under the 27 carpet have gone to the pleura because that is where the 28 target cell is. I don't know if I used that term. Target	Page 119 1 lung. Most of it is covered. There is fiber down here that 2 is completely covered and you can just see a little bit of 3 end of it poking through, almost through the cell. 4 Maybe you have noticed these characters look 5 kind of like doughnuts. Obviously you don't have doughnut 6 in your lungs. This is what your red blood cells look like. 7 Your red blood cells. This is the lung of a rat. But our 8 red blood cells look exactly like mouse accurate blood cells 9 and they are the same size and do exactly the same thing. 10 They carry oxygen and carbon dioxide. And they look like 11 doughnuts because they have a depression in the center not a 12 hole but a depression. And so notice that these red blood 13 cells are marching through the lung in single file through 14 the small vessels called capillaries. Capillaries are the 15 smallest blood vessels and they carry blood through the lung 16 and all the blood in our bodies versus to run through our 17 lungs because wherever we are making carbon dioxide in our 18 brain and fingertips and toes we have to give off the carbon 19 dioxide in the lung and pick up the oxygen from the room air 20 and that happens right across this membrane right here right 21 across this membrane where we are exchange oxygen and carbon 22 dioxide. 23 Wherever blood flows in the body there is a 24 fluid call lymphatics. Lymphatics are clear fluids that run 25 head to toe in our bodies. Wherever the blood flows there 26 are lymphatic flow around the blood. 27 Now the lymphatic flow in the lung flows to 28 the pleura. I can show you that in the next slide.
Page 118 1 cell is the cell from which that disease develops. 2 If there is mesothelioma, that means that 3 sufficient fibers have reached the target cell to cause 4 genetic damage. In the next few slides I am going to show 5 you how the fibers get from the site on the carpet out to 6 the target cell. 7 Q. What kind of asbestos did you use in this 8 experiment? 9 A. This is Crysotile. 10 Q. That is the top one I have written here? 11 A. That's right. 12 Q. And when you mentioned when the greater 13 amounts accumulate, is that you are referring to dose there 14 when somebody has a greater dose of asbestos in the 15 background level? 16 A. That is right. Whatever the person is 17 exposed to is their dose. 18 Q. Okay. 19 A. Whether it's the few fibers at a time 20 outside or whether it's something that has been in an 21 occupational environmental setting. That is the dose. 22 So let's follow the fiber and let's go to 23 another experiment. Another animal. Here is the air space, 24 there is another air space and another one here. You can 25 see that there a little fiber bundle right here. This is 26 several hours after exposure and you can see some of the 27 fibers here, but most of them are covered by the carpet 28 cell. There is a little bit of a fiber on its way in to the	Page 120 1 Q. All right. 2 A. So this you can see is a Netter diagram. 3 Dr. Netter was a physician who has fortunately for us 4 produced Atlas in the human body in health and disease. And 5 this particular diagram from Dr. Netter shows the 6 distribution of lymphatic vessels in the lung. 7 They are small half moon of which end that 8 is the pleura and that is this network that you can see Dr. 9 Netter has provided us with a picture of out at the surface 10 of the pleura. 11 Now, you may -- you can also see these 12 little green blobs here. And these little green blobs 13 represent what are called lymph nodes. Lymph nodes filter 14 lymphatic fluid. And you may have felt your lymph nodes on 15 the side of your neck or your arm pits or groin. Sometime 16 they get swollen or uncomfortable because the lymph fluid 17 can carry cells of the immune system of so if you are 18 fighting a cold like I am or if you have some kind of an 19 infection, you may feel your lymph nodes responding to the 20 presence of that infection. 21 Now, the point here is that we go back to 22 the previous picture that I am showing you here is the entry 23 way of fibers that have been inhaled to the lymphatics. So 24 you are in an atmosphere, someone is in an atmosphere where 25 there is asbestos. Some proportion lands down to the 26 carpet. The carpet picks those cells up and shoves them 27 under the carpet and some proportion of those can get into 28 the lymphatic system and we know that because carpet) some

Page 121 1 scientists study the lymph nodes and they said, "Well, if 2 asbestos in fact gets into the lymph, then we should be able 3 to find it in the lymph nodes which filters all of the 4 lymphs" and in fact that is what happened. 5 So we know that the fibers get into the 6 lymph and here is how they get into the lymph. And there is 7 one more diagram that we can look at here that explains that 8 a little further. This is from a diagram from a chapter in 9 a book and it actually shows the fibers so here is the end 10 of the airway. Asbestos getting down into the airways and 11 landing in the lung as I showed you and here is a single 12 fiber with a little bit of a sticking out into the air space 13 and then down into the lymphatics and the artist called this 14 lymphatic fiber transport to the pleura. 15 So what the artist didn't know or he was 16 drawing a picture of exactly what I showed you here with 17 this little fiber sticking out into the air space and then 18 the rest of it on its way into the lymphatics. 19 Q. Doctor, let me ask you: Can Crysotile 20 fibers go into the lymphatic system and reach the pleura? 21 A. Absolutely that has been shown. Some 22 investigators actually looked at the pleura and collected 23 the fibers that were -- that had reached the pleura. In 24 other words, they actually digested the pleura and asked 25 what kinds of fibers were there and they found predominantly 26 Crysotile. All the asbestos varieties certainly can reach 27 the pleura. 28 Q. But in the scientists who have studied and	Page 123 1 holds the stomach and intestines. 2 Q. What is this one? 3 A. So -- 4 Q. Can you go back to previous slide and I just 5 want to ask you: So the thickened area represents the 6 mesothelioma? 7 A. That's right. 8 Q. That is the cancer? 9 A. That is the cancer. 10 Q. And that is normally as thick as a piece of 11 saran wrap in a healthy human being? 12 A. Is that what it should be, that's right. 13 Q. And can you describe for the ladies and 14 gentlemen of the jury, how fast or aggressive this cancer is 15 once it's diagnosed compared to other cancers? 16 A. Well, typically it grows very quickly. 17 Unfortunately it's unusual to have a person live as long as 18 18 months. That would be a long time. 19 Q. And can the cancer although it beginning in 20 the pleura travel to other areas of the body? 21 A. Exactly and you can see that here as well. 22 Q. And do doctors have methods of determining 23 if they find a cancer elsewhere determining where that 24 cancer originated, where it began? 25 A. Sure because there are special stains that a 26 pathologist, a diagnostic pathologist can say where these 27 mesothelial cells are and go back and see if in fact where 28 the mesothelioma originated.
Page 122 1 this and examined humans they found the majority are 2 Crysotile that reach the pleura? 3 A. That's right. 4 Q. All right. 5 A. I'm sorry. I just wanted to show you these 6 macrophages are trying to clean up. Here are a few of them. 7 1, 2, 3, 4, 5. They are sharing fibers with one another. 8 And it's a constant process where the macrophages are trying 9 to clear the lung of what is deposited in the lung. 10 I can spend the rest of time I have five or 11 six more slides. 12 Q. I don't think we are going to use this. 13 A. Just for one second. 14 Q. Let's skip this one and this is a slide of 15 what, sir? 16 A. This is mesothelioma. 17 Q. Okay, and again is this by the same Dr. 18 Netter who drew the earlier picture? 19 A. That's right. 20 Q. Tell the ladies and gentlemen of the jury 21 what Dr. Netter has depicted in this slide? 22 A. Remember that the normal pleura -- I can 23 show that for one second. This is normal pleura, thin 24 shiney but with mesothelioma it becomes dramatically 25 thickened with cancer cells. And so Dr. Netter is 26 demonstrating the distribution of the tumor when it is grown 27 out along the surface of the lung can invades the lung as 28 well as peritoneal cavity which is the body cavity which	Page 124 1 Q. And at the bottom are just some picture of 2 slides that would be looking at cancer cells under the 3 microscope, is that correct? 4 A. That's correct. 5 Q. And then to the right of that is a picture 6 of an X-ray? 7 A. That's correct. 8 Q. And what is shown on that X-ray? 9 A. Well, it's dramatically thickened. This is 10 just a lit bit of normal lung that you can just barely see. 11 Most of it is surrounded by dramatically advanced tumor. 12 Q. Doctor, do you know as a consequence of 13 mesothelioma in the pleura is to have pleural fluid gather 14 in that area? 15 A. That is usually an early response. That is 16 one the earlier signs that there has been abnormal growth in 17 the pleura. 18 Q. Thank you, sir. Go ahead. 19 A. So I am going to spend the rest of the time 20 explaining how asbestos can act as a carcinogen. That is a 21 cancer causing agent. And I will start with this slide 22 which is from a proceedings of a meeting that I was at a few 23 years ago. I gave a talk at this meeting. And the topic of 24 this meeting was how fibers cause cancer and you can see the 25 big word carcino, cancer, and genesis means formation. 26 So this is cancer formation and I talked to 27 you today about cells and I showed you cells can pick up 28 fibers.

Page 125 1 THE COURT: Don't repeat. Just go ahead. 2 Q. Okay. Is this photograph here one that you 3 took, doctor? 4 A. No, this is from -- similar to some 5 experiments I have done but that is on the cover of the 6 proceedings and it shows an important part of this kind of 7 process. 8 Q. And what does it show, sir? 9 A. So this is dealing with what is called the 10 molecular aspects and you can see it here. Molecular 11 aspects meaning your genes because cancer is a genetic 12 disease. For example, we can take cells like these and you 13 can see I am outlining a cell for you. We can take cells 14 like these and take them out of human or out of animal and 15 put them in a dish and add fibers to those cells. And you 16 can see some fibers have been added and those fibers collect 17 around the center circle in the cell and that center circle 18 is call the nucleus and it contains all our genes. Every 19 cell in our body has a nucleus that contains all of our 20 genes. And cancer is the loss of control of cell growth. 21 That is the simplest definition of cancer. 22 Cancer is the loss of control of cell 23 growth. 24 Q. Doctor, that means when you have cancer, the 25 cells just keep growing without any regulation? 26 A. That's correct. And we have about -- humans 27 have been 20,000 genes. And of those 20,000 genes 28 approximately 100 of them are dedicated to controlling cell	Page 127 1 division. The chromosomes have formed and now they are 2 duplicating. They are making perfect copies of one another. 3 That is exactly what you hope for. If that happens, then 4 you get what are called daughter cells. And those daughter 5 cells are then copies of the original, that is what you 6 expect every time. 7 Q. And there are certain genes that control how 8 often that replication or that growth occurs? 9 A. Exactly. And there is a very tight command 10 of that by a set of genes, and for cancer to develop you 11 have to have damage in those growth control genes. 12 Q. Go ahead. 13 A. So let me show you an experiment from my 14 laboratory and then I will show you one -- another example 15 of that. 16 Over here in panel A we took some of these 17 cells out. So here are two of millions of cells that we did 18 in this experiment. The panel A there is a cell with no 19 fibers, half of the chromosomes went to one side. Half to 20 the other. That is exactly what you expectg. 21 Q. Everything normal is A? 22 A. Everything is on its way to normal. 23 A. Over here in panel B there are fibers 24 introduced and there is a long fiber here about 30 microns 25 long. There is a 20 micron fiber. There are some 5 micron 26 fibers and you can see that some of the DNA is bound to the 27 surface of the fibers. That means that not all of the DNA 28 is reaching its normal position in the newly forming cells.
Page 126 1 growth. If there are a series of errors or what are called 2 gene damage, genetic damage to those genes that control cell 3 growth that opens the door to cancer and that is what I will 4 show you. 5 Q. Go ahead. 6 A. So this is now normal cell division. And 7 that means the cell -- there are three cells here 1, 2, 3. 8 The two cells on the outside are normal and are not growing. 9 The nucleus with all of the genes is intact. The DNA has 10 been stained blue so you can see it. The cell in the center 11 received a signal to divide. It could be skin cell that 12 needs to be replaced or for whatever reason, that cell is 13 dividing. When cells divide, all of the DNA gets 14 incorporated, condensed into these white threads called 15 chromosomes. Chromosomes are bands of condensed DNA. 16 Let me show you what the chromosomes like 17 like. We have 23 pairs of chromosomes, one from your mother 18 one from your father. These light and dark bands on the 19 chromosome represent where your genes are. In each one of 20 these dark bands, it could be ten genes for a thousand 21 genes, but they all must be on the correct chromosome in the 22 right place on that gene. 23 No mixing and matching allowed. 24 Q. So this is the blueprint of the 25 characteristics of a person? 26 A. Exactly. And so you must have what is 27 called faithful replication. In other words, here now let's 28 finish this process of cell division. Here is normal cell	Page 128 1 Q. What is the consequence of that doctor? 2 A. That leads to at that condition called 3 aneuploidy in the upper right hand corner aneuploidy means 4 abnormal chromosome separation. This is not cancer. These 5 are not cancer cells. These are cells that are more likely 6 to become cancer if the -- if there are additional errors 7 because a single error is not sufficient to produce cancer. 8 Q. By error, you mean damage to genes or DNA? 9 A. That's correct. And in fact it takes 10 multipliers. I can't tell you exactly how many. I would 11 like to be able to tell you just how many and exactly what 12 genes have to be damaged. Nobody can tell you that and that 13 is very important area of research. And it's different for 14 different people. A lot has to do with susceptibility, 15 whether or not a person is more or less likely to get 16 disease. This is from experiments in which mesothelioma 17 cells were used. 18 Here is a mesothelioma cell with normal 19 fiber in it. Half of the chromosomes going to one side. 20 Half to the other. We will get two new daughter cells. 21 On this side the daughter cells have formed 22 but there is some DNA stuck to this Cryostile fiber and that 23 again has resulted in the condition of aneuploidy. 24 Q. And this slide here shows mesothelial cells 25 that have been damaged merely because Cryostile has been 26 introduce into this area? 27 A. That's correct. And in fact we and others 28 have produced cancers right in the dish by producing these

Page 129 1 genetic errors right in the dish. 2 Of course, it's a different situation in the 3 animals than people because you have all of the defense 4 mechanisms and one of the major defense mechanisms we have 5 are a sets of genes that will Stop these cells from growing. 6 Most of those aneuploid calls die. And that is exactly what 7 is supposed to happen. The point is if there is a cancer, 8 those cells with errors keep growing. 9 And I have one more slide to finish this 10 discussion, and this slide -- by the time I am finished with 11 this slide I would like to you to understand what happens 12 during this period right here called latency that Mr. Hart 13 drew up here on this board. 14 So here is a single layer of cells. Very 15 much like your mesothelial cells. Single file single sheet 16 on the surface of the mesothelium. 17 And you can see that the artist has given us 18 DNA damage here and a couple of lightning bolt. As far as I 19 know lightning doesn't cause DNA damage. The point is this 20 is something from the environment. Something from the 21 outside has influenced the DNA has caused DNA damage. 22 Then the artist produces from the cell with 23 DNA damage and you can see the chromosomes forming. He has 24 two daughter cells. One daughter cells goes off to the 25 upper left-hand corner and dies. That is exactly what is 26 supposed to happen and that is what you expect to happen. 27 And for a person who doesn't get a cancer like most of us, 28 cells with genetic damage are going to die. The rest of	Page 131 1 if they get genetic errors because one of the factors of a 2 cancer cell is that it can be immortal. That means it won't 3 die. And that cell then can pass on those genetic errors. 4 So now let's go to the end of the latency period, whatever 5 it is. 30 years or so. And here is this daughter cell now 6 or a cell that originated from that daughter cell decades 7 later and it has five, six, 7 errors. Sufficient for that 8 cell to now start to divide in an uncontrollable pattern. 9 Two cells. Four cells. 8 cells. 16, 32, etc., etc. Until 10 finally it grows out as a cancer and the person then 11 develops symptom and reaches the clinic. 12 Q. Thank you, doctor. 13 Doctor, you have been talking about this in 14 terms of the -- you described in terms of latency from the 15 initial exposure. Is it only the first exposure that 16 scientists have found is important in producing disease in a 17 person who develops mesothelioma? 18 MR. WALLACE: Objection, your Honor. Exceeds the 19 scope of the qualifications of the witness. 20 THE COURT: Overruled. 21 THE WITNESS: No, not at all. It's the -- all of 22 the exposures up to about ten years prior to the development 23 of a cancer can be counted. 24 Q. And in terms of a person who is subjected to 25 repeated exposures, what are the effects of the additional 26 exposures to that person's risk of developing mesothelioma? 27 A. Well, that is the dose you were talking 28 about and it's the dose for that person that caused the
Page 130 1 what I have to say is about a person who has a cancer. 2 An if a person has a cancer that means that 3 a daughter cell was passed on with an error in what gene 4 that controls cell growth. Now you can see this tumor. He 5 has tumor genesis here. Tumor formation. All of these 6 cells that are in the tumor have the same color because they 7 all came from the same cell. But from the time this 8 daughter cell was formed after the initial DNA damage to the 9 time the tumor formed is the latency period of decades. 10 So what happened here is the following: You 11 just think now about this mesothelial surface with a 12 daughter cell with an enter and it divides that daughter 13 cell with an enter has to be able to divide. Now you have 14 two of them with the same error. 15 Four of them. 8 of them. 16 Okay, 7 of them die because those growth 17 controlled genes are working. But you still have one and it 18 still has that error and it's sitting on the mesothelium and 19 it gets hit again with another asbestos fiber. That could 20 be months later it could be year later. It gets hit again 21 and develops another error. Now it has two errors. Two 22 cells, 4 cells, 8 cells. 6 of them get recognized by our 23 immune system which is very good at recognizing potential 24 cancer cells but there are still two calls left. They 25 divide. 2, 4. Every time there is a set of daughter cells 26 with additional errors and those daughter cells then move 27 out on to the mesothelial surface and the years go on, let's 28 go now, these cells can live, months and years, particularly	Page 132 1 disease. So every time there is an exposure and it 2 increases the risk, you have a person with disease. The 3 risk is a hundred percent because that person got a 4 sufficient exposure. 5 Q. Let's look at it from the other point of 6 view. If you have someone with mesothelioma and you look 7 back on their history and you see they were exposed from 8 different sources over a few years, can you a scientist or 9 doctor look back and say this exposure did not contribute to 10 causing the cancer? 11 MR. WALLACE: Same objection, your Honor. Exceeds 12 the scope of the witness' qualifications. 13 THE COURT: Overruled. 14 THE WITNESS: There is no way to do that. You 15 cannot go back and sort out the individual exposures. Any 16 one of them where there is a documented exposure to 17 objection can contribute fibers to that lymphatic system and 18 they can reach the pleura. 19 Q. Likewise, doctor, if someone has a 20 history -- someone with mesothelioma has a history of being 21 exposed to Crysotile Amosite and even Crocidolite asbestos 22 can you look back on that person's history and say any of 23 those types of fibers did not contribute to causing the 24 mesothelioma? 25 A. No, you can't do that. All of those fiber 26 types can reach the meosthelial cell and cause the genetic 27 errors required and whatever the person was exposed to 28 causes disease.

Page 133 1 Q. Doctor, in terms of the potential to cause 2 cancer, are you familiar with the term potency? 3 A. Sure. 4 Q. Is asbestos a potent carcinogen? 5 A. It is, sure. 6 Q. What does that mean? 7 A. That means it has a high likelihood of 8 causing the genetic errors that are required. 9 Q. Okay, does dose have a role in the potency 10 of the ability of asbestos to cause cancer? 11 A. Yes, sure. 12 Q. And so the greater the dose, the greater the 13 potency, is that the fair? 14 A. Well, potency -- you would have to do by 15 looking at the individual fibers. They are all potent 16 carcinogens. The likelihood that the cancer is going to 17 occur is certainly dependent on the dose. 18 Q. Looking at the individual fiber here, the 19 three type that I have put up there, are each of those 20 potent causes of mesothelioma? 21 A. Yes. 22 Q. And the Crysotile, Amosite and Crocidolite? 23 A. Yes. 24 Q. Are any of those more potent than the 25 others? 26 A. Yes. 27 Q. And can you tell us the order please, sir? 28 A. Right, so there interest different numbers,	Page 135 1 to speak there tomorrow, did I offer to pay your expenses 2 today to come here for your time in testifying before this 3 jury today? 4 A. Of course. 5 Q. And have you testified in court before on 6 similar matters? 7 A. Many times. 8 Q. And is it customary for you and other 9 doctors and scientists to request payment for their time and 10 expenses in appearing before juries? 11 A. Certainly. 12 Q. And have you in fact testified for other 13 persons, families who have had mesothelioma? 14 A. Many times. 15 Q. And have you testified upon request for 16 certain companies who have been defendants in cases brought 17 by families with mesothelioma? 18 A. Exactly. They have asked -- as long as they 19 have asked me to give the exact same testimony you asked me 20 to give today, sure I have done it. 21 Q. No matter who asks you to testify you will 22 certainly give the same testimony and likewise you expect 23 that your expenses and time to be reimbursed to you? 24 A. Of course. 25 Q. Doctor, thank you very much for your time. 26 That is all my questions, your Honor? 27 THE COURT: Thank you. Defendants who wishes to go 28 first.
Page 134 1 so I have never developed any numbers. I have not tried to 2 make those kinds of comparisons, but those who do the kinds 3 of comparisons say Crocidolite is more potent than Amosite 4 Amosite is more potent than Crysotile. I don't know any 5 basis for saying Amosite is more potent than Crocidolite. 6 I don't know where they would be any different. 7 Q. Your opinion is they are equal in potency? 8 A. That is my opinion, but you can make 9 arguments. 10 Q. Others have other opinions? 11 A. My opinion is Crocidolite and Amosite are 12 equally potent and both of them are more potent than 13 Crysotile. That is on a fiber per fiber basis. So you need 14 to know what the person is exposed to. If they were exposed 15 largely to Crysotile, it doesn't matter how much Amosite or 16 Crocidolite they were exposed to. 17 Q. Is it important for the fiber to reach the 18 pleura in order to be potent in causing mesothelioma? 19 A. No question. 20 Q. And in terms of usage in the United States 21 you mentioned Crysotile was used 95 percent of the time? 22 A. That's correct. 23 Q. And can you give us in order the other time? 24 A. I am not really sure. 25 Q. But they would combine to be approximately 5 26 percent? 27 A. That is what I understand. That's right. 28 Q. And doctor, although you are coming to USC	Page 136 1 MR. MOLLAND: If it please the court. 2 THE COURT: Mr. Molland. 3 4 + CROSS-EXAMINATION 5 MR. MOLLAND 6 Q. Good afternoon, Dr. Brody. It's late in the 7 day I will try to be as brief as I can. 8 Mr. Hart asked you about the number of times 9 you have testified in cases. Would it be fair to say you 10 have testified in many mesothelioma cases in the last five 11 or six years for plaintiffs' attorneys like Mr. Hart? 12 A. Sure. 13 Q. And about how many times a year do you 14 testify in mesothelioma cases for plaintiffs' attorneys like 15 Mr. Hart? 16 A. Maybe once a month, once every or month 17 something like that. 18 Q. About ten? 19 A. Yes. 20 Q. I want to make sure we understand what you 21 have done in the case. You looked at medical records? 22 A. Right. 23 Q. And you haven't looked at any work records? 24 A. I wasn't asked to do that. 25 Q. You really know nothing about the plaintiff 26 and plaintiffs' family in this case? 27 A. I was asked to assume there was exposure and 28 he has mesothelioma.

Page 137 1 Q. You don't even know the name of the 2 plaintiffs' family in this case? 3 A. I don't. 4 Q. So really would it be fair to say you know 5 nothing about the facts of this case and the testimony you 6 have given to the jury is what you generally say to all the 7 juries that you talk to for plaintiffs' lawyers in 8 mesothelioma? 9 A. It's the generic understanding of how 10 asbestos causes disease, that's right. 11 Q. That is all I wanted to establish. I will 12 move on. 13 Let's talk first of all dose response. You 14 are the first witness in the case and I don't want to put 15 too heavy a burden on you. Let's talk a little bit about 16 dose response. 17 You mentioned three diseases that are -- you 18 believe are caused by asbestos, correct, asbestosis, lung 19 cancer, and mesothelioma, right? 20 A. That's right. 21 Q. Asbestosis is a dose response disease, 22 right? 23 A. Sure they all are. 24 Q. They all are. That means the more asbestos 25 you are exposed to, the more likely it is you will get one 26 of those diseases, right? 27 A. Yes. 28 Q. And it also means the less asbestos you are	Page 139 1 A. Sure as I discussed. 2 Q. You don't know any responsible scientist who 3 would say that Amosite is the same -- on a fiber per fiber 4 basis has the say potency as Crysotile, correct? 5 A. I don't know anyone who would say that. 6 Q. And when you say 95 percent of the asbestos 7 used in this country was Crysotile, you don't have any idea 8 how much of the asbestos used about by the United States 9 Navy used Crysotile as opposed to Amosite do you? 10 A. I do not. 11 Q. In fact, you know that insulation, 12 especially the insulation workers that were studied by Dr. 13 Selikoff used asbestos insulation that contained high 14 quantities of Amosite, correct? 15 A. I can't tell you how much but that is what I 16 understand that they were exposed to that, to Amosite, yes. 17 Q. Now, although all three diseases that are 18 associated with asbestos are dose response diseases, some of 19 those diseases are caused only by a very high dose, correct? 20 A. You mean asbestosis and lung cancer? 21 Q. Yes. 22 A. Sure. 23 Q. So as to lung cancer and asbestosis only 24 very thigh doses of asbestos cause those diseases, right? 25 A. Correct. 26 Q. And mesothelioma is different because a 27 lower dose will cause the disease, correct? 28 A. Exactly.
Page 138 1 exposed to, the less likely it is that you will get a 2 mesothelioma, for example, correct? 3 A. Brilliant. Right. 4 Q. And dose means to you two things. First it 5 means the number of fibers you inhale, correct? 6 A. Pright. 7 Q. And it also means the potency of the fiber 8 you inhale, correct? 9 A. Well, I mean, you know -- each fiber has its 10 own potency -- 11 Q. Correct. 12 A. But the dose is what the person gets. 13 Q. Correct? 14 A. Whatever the fiber type. 15 Q. And if somebody has twice as much Amosite as 16 than Crysotile, they would have a heavier dose of asbestos, 17 correct? 18 A. No, that is not true. That is just not the 19 definition of dose. 20 Q. I just don't know how you define dose. You 21 don't regard potency as part of dose? 22 A. I didn't say that. All I am saying is you 23 can't say here the person was exposed to something is more 24 potent and therefore they got a bigger dose. You just can't 25 say that. 26 Q. I don't want to argue with you. You don't 27 regard the differences in asbestos fibers as significant in 28 causing disease at lease mesothelioma?	Page 140 1 Q. But they are all dose response diseases even 2 mesothelioma meaning -- the more you are exposed to the more 3 likely you are to get the disease, correct? 4 A. True. 5 Q. For that reason asbestosis was discovered to 6 be connected with asbestos long before mesothelioma, 7 correct? 8 A. I think that is right. 9 Q. And in fact, the studies of asbestosis 10 generally took place in 1940s, 1950s, correct? 11 A. Well, that is when it was established that 12 those high exposures cause disease, right. 13 Q. And it wasn't until Dr. Wagner published his 14 research in 1960 that asbestos was discovered to be the 15 cause of mesothelioma, correct? 16 A. Right. 17 Q. And up until that time, scientists were not 18 aware that doses of asbestos would cause mesothelioma, 19 unless Dr. Wagner pointed that out, correct? 20 A. I would say they were not sure. In other 21 words there were indications from case studies and others 22 but he established that link. 23 Q. And Dr. Selikoff then four years later 24 established that persons who were pipe coverers or 25 insultators also were at higher risk of getting 26 mesothelioma, correct? 27 A. Right. 28 Q. And that was the first study of insultators

Page 141 1 in this country that established that fact in 1964, correct? 2 A. I think that's right. 3 MR. MOLLAND: I am going to just cover briefly 4 background asbestos. We will try to get it with another 5 witness. 6 But you agree that every person especially 7 in a city like Los Angeles has daily exposure to free 8 asbestos fibers in the air, right? 9 THE WITNESS: That is what I told the jury. 10 Q. You agree with that? 11 A. That is what I told the jury so of course. 12 Q. And it's reasonably -- most scientists 13 believe that most of us in urban areas breathe about 1 14 asbestos fiber a minute, right? 15 A. I've heard that number. That is probably 16 not way out of line. 17 Q. And Dr. Selikoff and others have established 18 that approximately 20 million people in the United States 19 have had exposure to asbestos on the job, right? 20 A. I don't know that number. If Dr. Selikoff 21 said it it's probably true. 22 Q. Would you disagree that millions of people 23 in the United States had exposure to asbestos on the job? 24 A. I am sure they have. I just don't know the 25 20 million number that is all. 26 Q. The point I want to make is this: 27 Asbestosis is caused by high doses of asbestos, correct? 28 A. Right.	Page 143 1 I simply want to show the prevalence of mesothelioma in this 2 country. 3 Would you agree with me, doctor, that 4 approximately 3000 to 4000 persons are diagnosed with 5 mesothelioma each year in this country? 6 A. Yes. 7 Q. And that is compared to approximately 8 200,000 persons who are diagnosed with lung cancer in this 9 country each year, correct? 10 A. Yes, I am not sure why you would make that 11 comparison but yes, that is right. 12 Q. And yeah, maybe I say it better this way. 13 You would agree with me that mesothelioma is a rare cancer 14 in this country? 15 A. That's true. 16 Q. And that is even though there have been 17 millions of people who have breathed asbestos on their job 18 in the United States, right? 19 A. Sure. 20 Q. And one of the reasons that you have done 21 your research is to show why that is true, correct, at least 22 one of the reasons? 23 A. Yes, we are interested in genetic 24 susceptibility.. 25 Q. And people who get mesothelioma because it's 26 a rare disease generally have in your opinion a genetic 27 susceptibility, that means there is something about their 28 genes that make it more likely they are going to get
Page 142 1 Q. But asbestosis now in this country is a very 2 rare disease, correct? 3 A. I agree. 4 Q. Hardly ever happens? 5 A. I agree. 6 Q. And that is because people aren't exposed to 7 those high doses of asbestos any more? 8 A. Correct. 9 Q. And it used to be that asbestosis happened 10 more frequently, correct? 11 A. Sure. 12 Q. And that is because people were exposed to 13 more asbestos in years past, right? 14 A. That's right. 15 Q. And lung cancer, although it's caused by 16 asbestos or can be, lung cancer in the absence, without 17 cigarette smoking is an exceptionally rare disease in this 18 country, correct? 19 A. I agree. 20 Q. Asbestos as a cause of lung cancer, again 21 without smoking is something that few scientists will 22 connect with asbestos to today in this country, correct. 23 A. I agree. 24 Q. Now, mesothelioma, the jury has heard quite 25 a bit about mesothelioma even though there haven't been 26 witnesses testify. 27 I am not trying to trivialize the despair 28 and tragedy of getting mesothelioma by asking this question.	Page 144 1 mesothelioma then others, right? 2 A. True. You can say that pretty much about 3 any cancer, that is true. Any environmentally induced 4 cancer. 5 Q. And one of the things your research has done 6 and I think that the slides you have shown the jury, it 7 shows how the body's natural mechanisms get rid of a lot of 8 foreign substances that get in the lungs, right, including 9 asbestos, right? 10 A. Sure. 11 Q. And it gets rid of it by exhaling asbestos, 12 right? 13 A. I don't think -- you can't exhale asbestos. 14 But that means it never lands. It just goes in and come 15 back out. I would say that is quite unusual. But it 16 certainly is expelled through the escalator a large number 17 of fibers. 18 Q. Bad choice of words. 19 The body expels asbestos naturally, right? 20 A. Right. 21 Q. And the body also you mentioned buries the 22 asbestos beneath this carpet, right? 23 A. Right. 24 Q. And then the body has genes that go out and 25 attack cells which are attacked by asbestos and get out? 26 A. Right. 27 Q. And for all of these reasons asbestos fibers 28 rarely result in mesothelioma even among people who are

Page 145 1 heavily exposed to mesothelioma on the job, correct, and 2 that is one the things that your research shows? 3 A. Exposed to asbestos on the job, that's 4 right. 5 Q. Were all of those picturese of -- lung 6 pictures of rats or mice that you sacrificed or were there 7 pictures of human beings in there as well? 8 A. Of course there were human. Some of them 9 were even labeled human. 10 Q. Of the asbestos fibers in the tissue. I'm 11 sorry. 12 A. That is okay. Obviously, we can't see the 13 fibers in the lungs of people as the disease is developing 14 so those were from the animals. 15 Q. Those were pictures that you had of animals 16 that inhaled asbestos and then you took pictures of their 17 lungs? 18 A. Exactly. 19 Q. And would it be fair to say that when you 20 expose animals to asbestos, you give them very high doses? 21 A. Actually they don't get a high dose. They 22 get a high concentration. And the reason they don't get a 23 high dose is they are exposed for such a short time that 24 there isn't a lot of time to get the high dose. If we kept 25 exposing them, then it would be a high dose. 26 Q. You don't expose for long periods of time. 27 You just give them a lot of asbestos over a short period of 28 time?	Page 147 1 A. No. 2 Q. All right, so some asbestos that the person 3 breathes contributes and some doesn't, right, to the cause? 4 A. That is fair enough. If we understand what 5 we are saying what happened to individual fibers, yes. 6 Q. So your opinion is a little different than 7 what you told Mr. Hart. It's the asbestos that gets to the 8 target cells that contributes to the mesothelioma in a 9 person that gets mesothelioma, correct? 10 A. Fine, but that doesn't change the opinion 11 that I gave to Mr. Hart because his question was do any of 12 the sources -- can any of the sources of the dose be 13 eliminated and the answer is still no. You can't do that 14 because any one of them can introduce fibers that are 15 expelled as well as fibers that reach the targets. 16 Q. What you are saying to the jury is you can't 17 rule any of them in and you can't rule any of them out, 18 right? 19 A. That's right fair enough. 20 Q. As to those fibers that get to the target 21 cells that eventually cause those errors that cause a 22 cancer, as to those fibers, you can't tell what percentage 23 of those fibers are -- what percentage of fibers a person 24 inhates are those fibersing right? 25 A. You can't do that. We know that about 20 26 percent of the fibers that land on the carpet get picked up 27 and of that percent some go to the pleura but I can't tell 28 you how many.
Page 146 1 A. High concentration, right. 2 Q. I hope we have time to finish this up. I 3 think I might. 4 You talked to Mr. Hart about your opinion 5 about how asbestos can't -- the asbestos dose a person 6 inhales cannot be excluded -- any of it can be excluded as a 7 cause if a person has mesothelioma. I think I got that 8 right is that your opinion. 9 A. Right. 10 Q. Can I approach, your and use the board? 11 A. Yes. 12 Q. Now, let's assume a person breathes asbestos 13 for two years on their job in the 1960s and then gets 14 mesothelioma? 15 A. All right. 16 Q. You can make that assumption? 17 A. Right. 18 Q. And some of that asbestos is expelled by the 19 body like you told the jury, right? 20 A. Right. 21 Q. And some of it is buried under the carpet, 22 correct? 23 A. Right. 24 Q. And some of it never gets to any target cell 25 to cause any genetic errors, right? 26 A. Correct. 27 Q. As to that asbestos do you believe that 28 contributes to the mesothelioma?	Page 148 1 Q. You don't know whether it's 1 in a hundred 2 that gets to the target cells that a person breathe or one 3 in a million or 1 in ten billion you just don't know? 4 A. No, I don't know. 5 Q. That being the case, some percentage and you 6 don't know how much of a person's asbestos that they breathe 7 for a couple years will eventually get to target cells and 8 could cause a mesothelioma, right? 9 A. And that actually raises the point you said 10 I can't rule them in and I can't rule them out. If there 11 was an exposure where there was asbestos in the environment 12 you can rule that source in. 13 Okay, so I think I answered your question 14 too quickly when you said you can't rule them in or rule 15 them out. If there is exposure, you can rule that in. 16 Q. You can rule it in because you can't rule it 17 out? 18 A. That is fine. 19 Q. Isn't that correct? 20 A. If we understand that is the point. In 21 other words, if there are fibers from that source, then 22 anyone -- then those fibers can reach the site. 23 Q. Potently possible that they can? 24 A. If a person has a mesothelioma, you know 25 that that a sufficient number have reached it in that 26 person. 27 Q. You don't know if it's one in a billion of 28 the fibers they inhale or one in a trillion or one in a

Page 149 1 million. You just can't tell? 2 A. You can't tell. 3 Q. Your opinion -- just to follow it 4 logically -- your opinion about causation is based upon dose 5 response, isn't it? 6 A. Okay, yes. 7 Q. You agree with that, don't you? 8 A. Why. 9 Q. That same person exposed to asbestos for a 10 couple of years 1960s and we will say it was Jack's source 11 of asbestos and there was Jill's source of asbestos. 12 And 99 percent of the asbestos this person 13 breathed for those two years came from Jack's asbestos. 14 1 percent came from Jill's asbestos. 15 Your opinion based upon what you just told 16 the jury is that Jack's asbestos would have 90 percent of 17 the cause of the mesothelioma, right? 18 A. Yeah, I mean that is the source that is more 19 likely to send more fibers to the pleura. 20 Q. I am following and trying to get your logic. 21 1 percent of the cause would be Jill's asbestos? 22 A. Sure. 23 Q. And 99.9 percent Jack's asbestos and 1 tenth 24 of a percent Jill's asbestos, Jack's asbestos would be 99 25 percent of the cause in your opinion of that mesothelioma 26 and Jill's would be one tenth of a percent, right? 27 A. Right. 28 Q. And we could go on and make this what?	Page 151 1 times more likely to cause mesothelioma than Crysotile, 2 correct? 3 A. On a fiber per fiber basis, sure. 4 Q. And if 99 percent of the asbestos was 5 Amosite and 1 percent was Crysotile, that means that Jack's 6 asbestos would actually be almost a thousand times more 7 likely to cause mesothelioma than Jill's under this 8 analysis, correct? 9 A. First of all, I have never heard it done 10 that way. I am not an epidemiologist or industrial 11 hygienist, but I wouldn't try to do it that way. I don't 12 know if you can do it that way. 13 Just the simple numbers make that 99 percent 14 from the Navy when it's Amosite even more potent no 15 question. 16 Q. And if it was 100 times, it would be 100 17 times and 2 times, it would be 2 times? 18 A. I can't -- I have never done it before. I 19 don't know why I would start now. I have never tried to 20 fool with the numbers that way. There is no question that 21 Amosite is more potent. 22 Q. You don't disagree with the proposition that 23 Amosite has been shown by respected scientists to be a 24 hundred times more potent in causing mesothelioma than 25 Crysotile, do you? 26 A. That is correct. There is one paper that 27 has come up with those kinds of numbers. I don't argue with 28 those numbers. They may be right, but what that means is
Page 150 1 Million and this one and this was a million you believe that 2 Jack's asbestos was a million times more likely to cause a 3 mesothelioma than Jill's right? 4 A. Although you wouldn't do it that way. Jill 5 still is putting some fibers into the system so you couldn't 6 say it's more likely to because they are all doing it. But 7 what you say about the 99 percent cause, sure. 8 Q. And if we change Jack to Navy your opinion 9 wouldn't change, would it? 10 A. I don't know about the name making a 11 different.. 12 Q. The name doesn't make any difference in your 13 opinion? 14 THE COURT: That is argumentative. Do you have 15 another question? 16 Q. I just have one other series of questions on 17 this and then I think maybe I can sit down and you can go to 18 USC. 19 Let's assume -- this assumes however in your 20 causation opinion or contribution opinion that all of the 21 asbestos is the same potency, doesn't it? 22 A. Yes. 23 Q. And now, if the asbestos was different 24 potency, this analysis would be different, wouldn't it? 25 A. It could, sure. 26 Q. Let's assume that Jack's asbestos was 27 Amosite and Jill's asbestos was Crysotile. Do you know of 28 responsible scientists who believe that Amosite is a hundred	Page 152 1 for every 1 Amosite fiber, you need a hundred Crysotile 2 fibers to be the same potency, and if that is what you mean, 3 that is fine. 4 Q. One question about the term susceptibility. 5 Could you tell the jury what you mean when you use the word 6 susceptibility? 7 A. That means one's likelihood of developing 8 disease, more or less susceptible. 9 Q. And I believe it's your opinion that because 10 mesothelioma is a rare cancer, that if somebody actually 11 develops mesothelioma, they had a genetic predisposition 12 that caused that, correct? 13 A. Well, that is not what caused the disease. 14 They had a genetic predisposition to developing an asbestos 15 induced mesothelioma, sure. 16 Q. And the fact that the mesothelioma occurred 17 is proof of that, is that your opinion? 18 A. Right. That is fine. 19 MR. MOLLAND: I am going to stop. I am finished 20 with my cross-examination. 21 THE COURT: Any other defendants have any 22 cross-examination of Dr. Brody? 23 MR. WALLACE: Yes, but it's going to take a while. 24 THE COURT: How long? 25 MR. WALLACE: I am guessing at least 30 minutes. 26 THE COURT: Okay, well in that case Dr. Brody will 27 have to come back. 28 Let me remind the jury once again not to

1 discuss the case with anyone or allow anyone to discuss the
2 case with you, not to discuss the case among yourselves, and
3 not to form any opinions or come to any conclusions.

4 We will be in recess until tomorrow morning
5 at 9:30 have a pleasant evening.

6 Please make sure everyone is here on time.
7 Leave your notebooks. You are not allowed to take any of
8 the notebooks out of the courtroom.

9 (Jury not present.)

10 THE COURT: Still on the record outside of the
11 presence of the jury. When will Dr. Brody be available to
12 return?

13 MR. HART: It will be next week and consult with
14 Dr. Brody and defendants will work out something agreeable.

15 THE COURT: Who is going to testify tomorrow?

16 MR. HART: Dr. Horn.

17 THE COURT: Dr. Horn?

18 MR. HART: Yes.

19 THE COURT: And how long is that testimony going to
20 take?

21 MR. HART: I expect it will take the day. Well, to
22 the extent we get through direct and cross we would want to
23 use the depositions we have tendered to your Honor.

24 THE COURT: Depositions and Dr. Horn, you think
25 that will consume the entire day?

26 MR. HART: Yes.

27 THE COURT: I will see all counsel tomorrow morning
28 at 9 o'clock.

1 (Adjourned)
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