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SC Court of Appeals

THE STATE OF SOUTH CAROLINA
In The Court of Appeals

APPEAL FROM RICHLAND COUNTY
Court of Common Pleas
Jean H. Toal, Circuit Court Judge

Appellate Case No. 2025-000065
Civil Action No. 2023-CP-40-04072

Michael L. Perry and Lonnie Long,..... Respondents,

v.

American International Industries et al.

Of whom Johnson & Johnson; LLT Management, LLC
f/k/a LTL Management, LLC; Kenvue, Inc.; and Johnson
& Johnson Holdco (NA), Inc. are the Appellants.

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I certify that this Designation does not contain any matters which are irrelevant to this appeal.

Exhibit AA

1 IN THE CIRCUIT COURT OF THE 17TH JUDICIAL CIRCUIT
2 IN AND FOR BROWARD COUNTY, FLORIDA
3 ASBESTOS LITIGATION
4 CASE NUMBER 18-014125 CA 27

5 - - - - - X

6 TERESA BIRCH and ROBERT BIRCH, :
7 ASSOCIATES, L.P., :

8 Plaintiffs, :

9 vs. :

10 GLAXOSMITHKLINE, LLC, etc., et al, :

11 Defendants. :

12 - - - - - X

13 Oral Deposition of DAVID MADIGAN, Ph.D.,
14 taken on Friday, February 7, 2020, held at the
15 law offices of PHILLIPS & PAOLICELLI, LLP,
16 747 Third Avenue, New York, New York, commencing at
17 10:10 a.m., before Jamie I. Moskowitz, a Certified
18 Court Reporter and Certified Livenote Reporter.
19
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21
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25

Job No. CS3970842

Page 82 1 and then we can take a break for lunch. 2 MR. TULLY: I'm wasting away here if 3 you can't tell, so that's good. 4 BY MS. STUART: 5 Q So on page 30 of this PowerPoint, we 6 see the exact same graph that was on page 2 of your 7 Asbestos and Mesothelioma report, with the scales on 8 the left-hand side, correct? 9 A Yes. 10 Q And the Y axis has four different 11 labels, correct? 12 MR. TULLY: Form. 13 THE WITNESS: There are four different 14 axes. 15 BY MS. STUART: 16 Q There are four different axes on the 17 same Y axes? 18 MR. TULLY: Form. 19 THE WITNESS: Sure. Yeah. 20 BY MS. STUART: 21 Q So the appropriate label -- the label 22 that you should be referencing changes depending on 23 which trend line you are looking at, right? 24 MR. TULLY: Form. 25 THE WITNESS: The label changes -- I	Page 84 1 Page 191 of Exhibit 15, the book in the narrative 2 portion on page 190 is saying that Graph C, which 3 has all that blank space beneath it, is a better 4 representation of the data because what appears to 5 be a substantial change is actually quite a modest 6 change. And you do not agree, correct? 7 A Correct. 8 MR. WOODARD: Objection. You can 9 answer. 10 THE WITNESS: Correct, I do not agree. 11 BY MS. STUART: 12 Q Okay. The -- 13 MR. BUSH: Could we just do it in two? 14 What does the book say? The objection was 15 compound, so what does the book say, and then I 16 think we got the agreement. 17 BY MS. STUART: 18 Q So you agree that the book is saying 19 that Graph C is better presentation of the data 20 because what appears to be a substantial change is 21 actually quite a modest change, correct? 22 MR. WOODARD: Objection. 23 THE WITNESS: I think that's right, 24 but I don't know. Let's see. 25 MR. WOODARD: Do you want to go back
Page 83 1 mean, they're on four different scales. 2 BY MS. STUART: 3 Q Okay. So do you believe that -- and I 4 understand that this is your opinion, but you think 5 this is an appropriate -- appropriate labeling of an 6 axis to use four different scales on one axis? 7 MR. TULLY: Form. Answer if you 8 understand. 9 THE WITNESS: Yes, I do, but I will 10 give you that it's complicated and -- you know, 11 which is why I didn't put it on the graph in 12 the first place. And, in fact, vis-à-vis the 13 point I was making, one is none the wiser 14 having seen the axis. 15 MS. STUART: Okay. Let's break for 16 lunch. Thank you. 17 (Whereupon, a lunch recess was taken.) 18 BY MS. STUART: 19 Q All right, Dr. Madigan. So I'm just 20 going to circle back on a handful of questions, not 21 go too in-depth, because I think we've gone over 22 this a number of times. But just really want to 23 establish what the book is saying, and what your 24 opinions are and where exactly they differ. 25 So with regard to the Figure 9.9 on	Page 85 1 and look at what the book says, again? 2 MS. STUART: It's -- 3 THE WITNESS: I guess it's -- I think 4 it's okay. So at the bottom it says, "Axis in 5 actual graph does not start at zero as a way to 6 exaggerate trend." So, therefore, I assume 7 they're criticizing this graph, and I don't -- 8 I don't agree. 9 As I said the last time, if we drew a 10 picture that went -- supposing all those 11 numbers had 10,000 added to them, then these 12 would go between 10,030 and 10,040, and if you 13 drew a picture that started -- a graph that 14 started at zero, you would see nothing, you 15 would just see a straight line. So, no, I do 16 not agree that this is a good picture. 17 BY MS. STUART: 18 Q Okay. And the book says -- under the 19 "No labeling on one or more axes," towards the end 20 it says, "In Figure 9.9-C, the vertical axis for the 21 original plot starts at 30 and stops at 40." 22 A Where are you? 23 MR. WOODARD: Where are you referring 24 to in terms of the page of the book? 25 MS. STUART: It is on Page 190.

22 (Pages 82 - 85)

FLORIDA RULES OF CIVIL PROCEDURE

Rule 1.310

(e) Witness Review. If the testimony is transcribed, the transcript shall be furnished to the witness for examination and shall be read to or by the witness unless the examination and reading are waived by the witness and by the parties. Any changes in form or substance that the witness wants to make shall be listed in writing by the officer with a statement of the reasons given by the witness for making the changes. The changes shall be attached to the transcript. It shall then be signed by the witness unless the parties waived the signing or the witness is ill, cannot be found, or refuses to sign. If the transcript is not signed by the witness within a reasonable time after it is furnished to the witness, the officer shall sign the transcript and state on the transcript the waiver, illness, absence of the witness, or refusal to sign with any reasons given therefor. The deposition may then be used as fully as though signed unless the court holds that the reasons given for the refusal to sign require rejection of

the deposition wholly or partly, on motion under rule 1.330(d)(4).

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VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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Exhibit BB

1 IN THE CIRCUIT COURT OF THE 13th JUDICIAL CIRCUIT
2 IN AND FOR HILLSBOROUGH COUNTY, FLORIDA

3 CASE NO: 19-CA-9136

4 MARLA HAMILTON and MARCUS HAMILTON,
5 Plaintiffs,
6 V.
7 PUBLIX SUPER MARKETS, INC., et al.,
8 Defendants.

9 _____/

10
11
12 REMOTE DEPOSITION OF DAVID MADIGAN, PhD

13
14 Pages 1 - 237

15
16 Tuesday, January 5th, 2021

17 2:16 p.m. - 8:33 p.m.

18
19
20 REPORTED BY: Beverly Bourlier James, RPR, CRR, FPR

21 Job Number: 4394426

Page 50 1 being held up, as you put it, right? 2 A. Happenstance. I mean, it is what it is. 3 You know, I run a curve through the data, this is 4 what it showed, a smooth curve. This model, it's a 5 model, a smooth curve. What it showed per this model 6 that the curve for the females drops off more slowly 7 than the males, full stop. 8 Q. And the curve, because you've smoothed it, 9 doesn't go through every single data point precisely, 10 right? 11 A. No, it doesn't. That was never -- that's 12 not the point. The point is that -- because you're 13 trying to look at the overall shape; that's why these 14 curve fitting techniques exist. 15 Q. Right. And some years there's more female 16 mesotheliomas than other years, right? 17 A. Sure. 18 Q. Right. And -- but the data, it can -- 19 A. The actual rates are in a different plot 20 in my report, you can look at them. 21 Q. Right, I know. I'm trying to say given the 22 uncertainty -- all right. Let me -- I'm going to 23 think about this and move on to another question. 24 All right. I just want to talk quickly -- 25 you know what, actually, we have been going for about	Page 52 1 Q. And they don't end in the same place, 2 right? 3 A. They are on different scales, right. 4 Q. Right, they are on different scales is what 5 I was going to. 6 And, so, just because -- where the green 7 line is visually above the blue line, that doesn't 8 mean that there were more female mesotheliomas than 9 male mesotheliomas that year, right? 10 A. Of course not. 11 Q. Okay. And why did you pick this scaling? 12 A. It's the default. I use software called 13 R, the letter R, and it just defaults to some small 14 amount below the minimum and some small amount above 15 the maximum. 16 Q. And is there a reason that it starts in 17 those locations? 18 A. It's considered good statistical practice 19 in terms of plotting things on these kinds of 20 pictures. So you want to go basically from the min 21 to the max, but with a little bit extra so that you 22 can get a -- you know, because, visually, you get a 23 clearer impression. 24 Q. Got it, okay. 25 I want to talk now about your power
Page 51 1 an hour, I don't know if you want to take a break or 2 not. It was actually an hour and a half since we 3 started, but an hour since the technical difficulties 4 ended. 5 A. Sure. Can we take five minutes? 6 MR. BUSH: Okay. 7 (Brief recess was taken.) 8 BY MR. BUSH: 9 Q. I just wanted to clarify one thing that 10 we've been talking about. The red line on your 11 graph -- 12 A. Yep. 13 Q. -- you were saying it represents domestic 14 consumption of domestically produced talc, is that 15 right? 16 A. It represents, strictly speaking, domestic 17 production of cosmetic talc. 18 Q. Okay. Now, I want to talk briefly about 19 the graph on the last page of Exhibit 6. 20 A. Okay. 21 Q. And we're going through it quickly; I know 22 you've testified about this before. 23 The female and male mesothelioma rates 24 don't start in the same place, right? 25 A. Correct.	Page 53 1 opinion. So that's your Talc and Asbestos report, 2 which is Exhibit 4. 3 A. Okay. 4 Q. And we're going to go to paragraph 54. 5 A. 54. 6 Q. Yeah, I'm trying to find -- oh, no, it's 7 not 54 in this one. 8 Sorry. It is paragraph 65. It's on page 9 18. 10 A. Okay. I'm there. 11 Q. And, so, just to orient us, you conclude 12 that there is insufficient power for the Rubino study 13 to detect a doubling or quadrupling of risk, right? 14 A. Right. 15 Q. And you conclude the power to detect a 16 doubling of the risk was 2 percent, right? 17 A. Give me a second here. 18 Yes, that's correct. 19 Q. And the power to detect a quadrupling of 20 the risk was 21.2 percent, right? 21 A. Right. 22 Q. And the generally accepted standard is 23 80 percent for sufficient power, right? 24 A. That's a little too sweeping, but, you 25 know, 80 percent is a common kind of desideratum for

FLORIDA RULES OF CIVIL PROCEDURE

Rule 1.310

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the deposition wholly or partly, on motion under
rule 1.330(d)(4).

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STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF RICHLAND	)	CIVIL ACTION NO. 2023-CP-40-04072
	)	
MICHAEL L. PERRY AND LONNIE L. LONG,	)	<i>In Re: Asbestos Personal Injury Litigation</i>
	)	Coordinated Docket
	)	
Plaintiffs,	)	<u>JOHNSON & JOHNSON DEFENDANTS'</u>
	)	<u>MOTION IN LIMINE TO EXCLUDE</u>
vs.	)	<u>EVIDENCE OF OR REFERENCE TO</u>
	)	<u>TISSUE TESTING</u>
AMERICAN INTERNATIONAL INDUSTRIES, ET AL.,	)	
	)	
Defendants.	)	

Defendants Johnson & Johnson (“J&J”), LLT Management LLC, Johnson & Johnson Holdco (NA) Inc. (“Holdco”), and Kenvue, Inc. (“Kenvue”), (collectively “J&J Defendants”) respectfully move the Court to exclude any evidence or testimony related to tissue testing in this case. Despite the best efforts of the Parties, the tissue has not yet been divided, let alone delivered to the parties’ respective experts. There is not adequate time for the parties to conduct tissue testing and complete necessary discovery before trial. The Court should exclude evidence of tissue testing entirely.

BACKGROUND

Plaintiffs allege that Plaintiff Michael Perry (“Mr. Perry”) was exposed to asbestos from his use of Johnson’s Baby Powder and that this exposure was a substantial factor in his development of mesothelioma. On August 8, 2023, Mr. Perry underwent surgery for mesothelioma.

On June 20, 2024, J&J Defendants contacted Plaintiffs to request assistance in obtaining Mr. Perry’s tissue from the hospital so that J&J Defendants could conduct a tissue digestion. See **Ex. A**, Email Correspondences, p. 14. Plaintiffs responded by asserting that they wished to conduct

their own testing as well. *See id* at p. 13. Over the next three weeks, J&J Defendants repeatedly followed up with Plaintiffs in an attempt to reach an agreement on a tissue division order (“Order”) as required by the hospital to obtain Mr. Perry’s tissue. *See id* at pp. 4–13. Finally, on July 8, 2024, the parties reached an agreement and intended to file the Order designating Plaintiffs’ expert Dr. William Longo and J&J Defendants’ expert Dr. Victor Roggli as the individuals conducting the tissue digestion. *See id* at p. 4.

That same day, however, J&J Defendants learned that Dr. Roggli, was no longer able to complete the digestion before trial. *See id* at pp. 1–2. Because of this development, and the fact that the pretrial hearing was three weeks away, J&J Defendants suggested that neither side test the tissue. *See id*. Plaintiffs disagreed and threatened to file the Order, despite knowledge that Dr. Roggli was no longer available to conduct his own testing. *See id* at p. 1. J&J Defendants immediately identified an alternative pathologist who had the capability to analyze the tissue prior to trial. *See Ex. B*, Email Correspondences, p. 3. The parties subsequently revised the Order to reflect the new expert who would perform the tissue testing for J&J Defendants. On July 9, 2024, the parties filed the Order with this Court.

On July 10, 2024, this Court entered the Order, appointing the Medical University of South Carolina Department of Pathology and Laboratory Medicine (“MUSC”) as the independent third-party responsible for dividing the blocks of lung tissue for digestion and sending it to the parties’ experts. *Ex. C*, Order Granting Joint Motion. On July 14, 2024, Plaintiffs confirmed that the Order had been sent to MUSC. *See Ex. B*, Email Correspondences, p. 2. J&J Defendants again followed up with Plaintiffs regarding the timing of the tissue division. *See id* at p. 1.

At the time of this filing, the tissue has still not been divided and J&J Defendants’ pathologist is not in possession of any materials to conduct testing on Mr. Perry’s tissue. On July

16, 2024, Plaintiffs' expert Dr. Longo conceded it would take him at least two to three weeks to complete the tissue testing. See **Ex. D**, Longo Dep., Perry, July 16, 2024, at 18:4-19:3. But even such timetable, Dr. Longo admitted, was "optimistic." *Id.* Without being in possession of any of the necessary materials to conduct a tissue digestion less than two weeks from the start of trial, there is simply not enough time for the tissue to be divided, sent to experts, analyzed, reports drafted, and depositions taken.

ARGUMENT & AUTHORITY

It is well established that the trial court has broad discretion in granting motions *in limine*. This authority is based on the Court's inherent power to admit or exclude evidence from trial, and its decision will not be overturned unless there is a clear abuse of that discretion. *Landry v. Hilton Head Plantation Prop. Owners Ass'n, Inc.*, 317 S.C. 200, 205, 452 S.E.2d 619, 621 (Ct. App. 1994). The trial judge is given broad discretion in ruling on questions concerning the relevancy of evidence, and her decision will be reversed only if there is a clear abuse of discretion. *State v. Jeffcoat*, 279 S.C. 167, 303 S.E.2d 855 (1983).

Rule 403 provides that relevant evidence should be excluded "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Rule 403, SCRE; see also *Jamison v. Ford Motor Co.*, 373 S.C. 248, 269, 644 S.E.2d 755, 766 (Ct. App. 2007). "Evidence is unfairly prejudicial if it has an undue tendency to suggest a decision on an improper basis, such as an emotional one." *State v. Williams*, 430 S.C. 136, 151 (2020) (citing *State v. Wilson*, 345 S.C. 1, 7 (2001)). The decision of whether to admit expert testimony is within the sound discretion of the trial court, and a ruling will not be reversed absent an abuse of that discretion. *State v. White*, 372 S.C. 364, 373 (2007).

The clock has run out through no fault of J&J Defendants. Allowing Plaintiffs to introduce late-produced, highly scientific evidence and opinions that have not and cannot be analyzed or cross examined by J&J Defendants prior to the start of trial has “the undue tendency to suggest a decision on an improper basis.” *State v. Wiles*, 383 S.C. 151, 158, 679 S.E.2d 172, 176 (2009). J&J Defendants would have no avenue to rebut the results of Plaintiffs’ testing. This kind of surprise evidence from an expert witness introduced during trial is the exact type of *unfair* prejudice that Rule 403 was meant to exclude. *See State v. Collins*, 409 S.C. 524, 536, 763 S.E.2d 22, 28 (2014) (“[T]he standard is not simply whether the evidence is prejudicial; rather, the standard under Rule 403, SCRE is whether there is a danger of unfair prejudice that substantially outweighs the probative value of the evidence.”). Accordingly, this Court is justified in prohibiting Plaintiffs from discussing tissue testing performed by Dr. Longo and/or introducing the results of his testing.

CONCLUSION

For the foregoing reasons, J&J Defendants respectfully request that the Court exclude any evidence or testimony about testing of Mr. Perry’s tissue.

[Signature Page to Follow]

Respectfully submitted,

NELSON MULLINS RILEY & SCARBOROUGH LLP

By: s/ Blake T. Williams

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Memphis, TN 38119
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Attorneys for Johnson & Johnson, Inc. (“J&J”); LLT Management, LLC (“LLT”) f/k/a LTL Management, LLC; Johnson & Johnson Holdco (NA), Inc. (“Holdco”); and Kenvue, Inc.

Columbia, South Carolina

July 23, 2024

Exhibit A

From: [Theile McVey](#)
To: [Kim Bueno](#); ["Rachel Gross"](#); ["Trey Branham"](#); ["Kathy Felix"](#); ["Teresa Gilliland"](#); ["Ben Adams"](#)
Cc: ["Blake Williams"](#); ["Mitch Brown"](#); [Chris Cowan](#); [Amy Pepke](#)
Subject: RE: Perry-- Tissue Division Order
Date: Monday, July 8, 2024 4:06:13 PM



Kim:

Respectfully, the narrative you put forth is just untrue. We have been going back and forth to agree on an order for weeks. You gave approval of the order on July 5th. We agreed with that Order and as of this morning were willing to go forward. That Johnson & Johnson did not check with their own expert to see about his availability, is not the Plaintiffs' issue. We will file the proposed order tomorrow. We will note that you agreed to this order this morning. Then, when you learned your expert could not do the digestion, you decided that no one should be able to do one. We will make sure the Court understands your objection.

Theile McVey
 Kassel McVey
 Post Office Box 1476
 1330 Laurel Street
 Columbia, South Carolina 29202
 803.256.4242
tmcvey@kassellaw.com
www.kassellmcvey.com

From: Kim Bueno <Kim.Bueno@butlersnow.com>
Sent: Monday, July 08, 2024 4:39 PM
To: 'Rachel Gross' <rgross@dobslegal.com>; 'Trey Branham' <tbranham@dobslegal.com>; 'Kathy Felix' <kfelix@dobslegal.com>; 'Teresa Gilliland' <tgilliland@dobslegal.com>; Theile McVey <tmcvey@kassellaw.com>; 'Ben Adams' <badams@dobslegal.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>
Subject: RE: Perry-- Tissue Division Order

Rachel,

I have confirmed that Dr. Roggli is unavailable to perform the tissue digestion before trial. I did everything in my power to obtain the tissue weeks ago, but too much time has passed. We are now three weeks before pretrial.

It is our position that it is too late for either side to do a digestion. We object to any destructive testing by Dr. Longo (or any other expert). If you decide to move forward with a digestion over our objection, we will need all back-up data by the end of this week (July 12) to adequately prepare for Dr. Longo's July 16 deposition. We will also need access to the grids.

Please provide a date for Dr. Zhang's deposition. We will then provide a date for Dr. Roggli.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

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From: Kim Bueno

Sent: Monday, July 8, 2024 11:59 AM

To: 'Rachel Gross' <rgross@dobslegal.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>; Ben Adams <badams@dobslegal.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: RE: Perry-- Tissue Division Order

Hi Rachel,

Please hold off on filing this order. I learned today that Dr. Roggli may not be able to complete the digestion in advance of trial. I have reached out for additional information and will report back soon.

We first asked for the tissue on June 20. In response, Plaintiffs decided to do a tissue

digestion as well. Since then, I have been trying to get the tissue division order in place. As noted in the email chain below, I have been following up consistently. We may now be in a position that it's too late for either side to do the digestion.

I'll let you know as soon as I have more information about Dr. Roggli's availability. Please do not file this order until I get back to you.

Thanks,

Kim

Kim Bueno

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From: Rachel Gross <rgross@dobslegal.com>

Sent: Monday, July 8, 2024 11:35 AM

To: Kim Bueno <Kim.Bueno@butlersnow.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>; Ben Adams <badams@dobslegal.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: Re: Perry-- Tissue Division Order

Hi Kim:

Thanks for checking in on this. Please see attached. This is the final version we will submit to the Court jointly and ask Chief Justice Toal to sign as soon as possible. Assuming you have no further edits, we will file today.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

<https://link.edgepilot.com/s/d6f57213/KVdNhGvHCK2zr4NcI7NZQg?u=http://www.dobslegal.com/>

RoA_05697

From: Kim Bueno <Kim.Bueno@butlersnow.com>

Date: Monday, July 8, 2024 at 8:57 AM

To: Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Theile McVey <TMcVey@kassellaw.com>, Ben Adams <badams@dobslegal.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: RE: Perry-- Tissue Division Order

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Rachel,

Good morning! I'm following up on the tissue division order. We are happy to finalize and file the proposed order for filing today. Feel free to give me a call if we need to discuss anything.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

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Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)

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From: Kim Bueno

Sent: Friday, July 5, 2024 9:59 AM

To: 'Rachel Gross' <rgross@dobslegal.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>; Ben Adams <badams@dobslegal.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: RE: Perry-- Tissue Division Order

RoA_05698

Hi Rachel,

We are fine with your edits, and we agree it makes sense to have the tissue sent directly to the experts. Can you please change the order to have Dr. Roggli's tissue sent here:

Melinda M. Swift Senior Legal Program Coordinator
Duke University Medical Center
200 Trent Drive,
Pathology Dept, 263M
Durham, NC 27710
919-684-4789

With that change, you may accept the redlined edits and finalize the proposed order. Will your team take the lead on getting this submitted to the Court? Please let us know how we can help. Please also alert us when the package is sent to Dr. Roggli, so we can give him a heads up.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

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From: Rachel Gross <rgross@dobslegal.com>

Sent: Thursday, July 4, 2024 9:52 PM

To: Kim Bueno <Kim.Bueno@butlersnow.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>; Ben Adams <badams@dobslegal.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>; Kim Bueno <Kim.Bueno@butlersnow.com>

Subject: Re: Perry-- Tissue Division Order

Hi Kim:

I tracked a few changes. You will see I deleted the paragraph where it noted Plaintiffs' counsel has the blocks and needs to send them to the hospital since MUSC is the one in possession currently. I also changed Zhang to Dr. Longo since he will be performing the digestion for Plaintiffs. Finally, I changed it to "the assigned pathologist at MUSC." MUSC general counsel's office has said they will forward our agreed order to the pathologist department, but it is unclear if it will be Dr. Harley specifically assigned to do the split so in the interest of time I have the order reflecting this. Please let us know if this is an issue.

My other proposal is that it may be more efficient for the tissue to be sent directly to Dr. Longo and Dr. Roggli rather than to each of us as a middle man along with proper chains of custody of course. If J&J agrees, we can make that change as well. Hope you and everyone else on this email had a nice 4th.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

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From: Kim Bueno <Kim.Bueno@butlersnow.com>

Date: Tuesday, July 2, 2024 at 11:54 AM

To: Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Ben Adams <badams@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>, Kim Bueno <Kim.Bueno@butlersnow.com>

Subject: RE: Perry-- Tissue Division Order

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Hi Rachel,

I reverted Paragraphs 5 and 8 back to the original to address your concerns. Please confirm we have agreement on the attached order. Please also confirm you have made arrangements with Dr. Harley to handle the division.

RoA_05700

Thanks,

Kim

Kim Bueno

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From: Rachel Gross <rgross@dobslegal.com>

Sent: Monday, July 1, 2024 4:14 PM

To: Kim Bueno <Kim.Bueno@butlersnow.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Ben Adams <badams@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: Re: Perry-- Tissue Division Order

Kim:

I am reviewing yours and Matt's edits to the order and it looks like there were substantial changes made in Paragraphs 5 and 8.

Paragraph 5 changed Chief Justice Toal's prior order from reading simply that "the remainder of the lung tissue is to be returned" to the attorney from our office representing Mr. Moss. It is unclear to me what J&J is wanting this paragraph to read as now. It looks as though if there are blocks both sides agree don't need to be tested, we still have to send it to MUSC to be split? And reserves built in time for J&J to decide it needs more tissue and to ask for a second split?

Paragraph 8 changed Chief Justice Toal's prior order from reading simply that "No grids will be exchanged unless by further order of this Court upon the showing that there is some necessity for the exchange of grids."

We are not really sure that there is any need to substantially alter a prior order with this same Defendant, in this same Court, signed by this same judge on the very same, identical issue. As it relates to your proposed edits reflecting that the prior plaintiff was deceased and Mr. Perry is still alive, those appear to be fine. Please let me know if you'd like to discuss further.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

<https://link.edgepilot.com/s/d6f57213/KVdNhGvHCK2zr4NcJZNZQg?u=http://www.dobslegal.com/>

From: Kim Bueno <Kim.Bueno@butlersnow.com>

Date: Monday, July 1, 2024 at 12:12 PM

To: Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Ben Adams <badams@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: Perry-- Tissue Division Order

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Hi Rachel and team,

I'm following up on our edits to your proposed tissue division order. Please let us know your thoughts and the answers to my questions below. We need to get this finalized, so the experts have time to complete their work.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

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From: Kim Bueno

Sent: Thursday, June 27, 2024 3:43 PM

To: 'Rachel Gross' <rgross@dobslegal.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix

RoA_05702

<kfelix@dobslegal.com>; Ben Adams <badams@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: RE: Perry-- Outstanding requests by J&J Defendants

Hi Rachel,

Attached please find the J&J Defendants' redlined edits to the prior tissue division order you provided. The prior order applied to a deceased plaintiff's autopsy tissue, not tissue preserved in blocks. For that reason, some of the paragraphs do not appropriately translate. Most of our redlined edits intend to clarify that difference.

We have not had contact with Dr. Harley for many years. Have you confirmed that he is still actively accepting litigation cases? If so, we have no objection to using him for this matter.

Thanks for identifying a deposition date for Dr. Zhang. We would like to depose him after he performs the tissue digestion. Please take that timing into consideration when you provide us a date. We will provide a date for Dr. Roggli after Dr. Zhang.

Please confirm the July 18 date works for Dr. Weill's deposition.

Always happy to discuss on the phone if that would be helpful. We look forward to hearing from you. Thanks!

Kim

Kim Bueno

Butler Snow LLP

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From: Rachel Gross <rgross@dobslegal.com>

Sent: Tuesday, June 25, 2024 9:56 PM

RoA_05703

To: Kim Bueno <Kim.Bueno@butlersnow.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Ben Adams <badams@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>
Subject: Re: Perry-- Outstanding requests by J&J Defendants

Hi Kim:

Thanks for following up. As J&J knows, I was in an all-day deposition today so I appreciate your patience. My notes in response are below.

1. I have attached a prior tissue protocol negotiated. You will see that this was a protocol agreed to previously in South Carolina, with J&J specifically, and signed off on by Chief Justice Toal. It also utilized a disinterested third party to perform the tissue split. I would suggest something much more in alignment with this prior order from this same court. Please let us know your thoughts.
2. I am working to get a new date for Dr. Zhang's deposition since numerous Defendants said they could not depose him on July 3rd. I will note, however, that the reason J&J said they couldn't depose Dr. Zhang is that there were already 2 depositions that day and now J&J is requesting that Dr. Weill's July 3rd deposition be moved - so that day is more available. Nevertheless, as soon as I have a new date for Dr. Zhang, I will circulate. I anticipate I will get everyone a date shortly.
3. No issue with a new date for Dr. Weill's deposition. Teresa and I will double check this date since there has been some expert date jostling recently and we want to make sure there aren't too many on the same date. Assuming 7/18 is good, we will re-notice.

I am in a hearing tomorrow morning with Chief Justice Toal, but if we need to discuss the tissue protocol further let me know.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

<https://link.edgepilot.com/s/d6f57213/KVdNhGvHCK2zr4NcJZNZQg?u=http://www.dobslegal.com/>

From: Kim Bueno <Kim.Bueno@butlersnow.com>

Date: Tuesday, June 25, 2024 at 3:19 PM

To: Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, Kathy

Felix <kfelix@dobslegal.com>, Ben Adams <badams@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Theile McVey <TMcVey@kassellaw.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>
Subject: Perry-- Outstanding requests by J&J Defendants

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Hi Rachel and team,

We are waiting to hear back from you on a few outstanding issues. I'm including them all here for your convenience. We look forward to your responses.

1. Please provide your approval (or edits) to the attached tissue division protocol. We need to get the tissue divided in the coming days, so both sides can analyze it before trial.
2. Please provide a date for Dr. Zhang's deposition. We owe you a date for our pathologist's deposition, but we need to get a date for Dr. Zhang first.
3. Please confirm your availability to depose Dr. Weill on July 18. As I mentioned in my email on Tuesday, he is no longer available on July 3.

Thanks,

Kim

Kim Bueno
Butler Snow LLP

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Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)

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From: Kim Bueno

Sent: Monday, June 24, 2024 11:21 AM

To: 'Rachel Gross' <rgross@dobslegal.com>; 'Trey Branham' <tbranham@dobslegal.com>; 'krutoski@dobslegal.com' <krutoski@dobslegal.com>; 'emoultrie@dobslegal.com'

RoA_05705

<emoultrie@dobslegal.com>; 'Kathy Felix' <kfelix@dobslegal.com>; 'Ben Adams' <badams@dobslegal.com>; 'Teresa Gilliland' <tgilliland@dobslegal.com>; 'Theile McVey' <TMcVey@kassellaw.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>
Subject: RE: Perry-- Court Order for MUSC Tissue

Hi Rachel,

Here is our proposed tissue division protocol for Perry. I understand this is the same protocol that we negotiated in other recent cases. Please let us know if you have any edits or want to discuss.

We need to get this process started ASAP to ensure there is adequate time for the division and selection process. Thanks for your prompt consideration.

Kim

Kim Bueno

Butler Snow LLP

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From: Kim Bueno

Sent: Thursday, June 20, 2024 4:31 PM

To: 'Rachel Gross' <rgross@dobslegal.com>; Trey Branham <tbranham@dobslegal.com>; 'krutoski@dobslegal.com' <krutoski@dobslegal.com>; 'emoultrie@dobslegal.com' <emoultrie@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Ben Adams <badams@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; Mitch Brown <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: RE: Perry-- Court Order for MUSC Tissue

Hi Rachel,

If you could send around the prior order on division of tissue, that would be great. We will take a look. Happy to set up a call if necessary.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

D: (737) 802-1820 | C: (512) 699-3255 | F: (737) 802-1801

1400 Lavaca Street, Suite 1000, Austin, TX 78701

Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)

[X \(Twitter\)](#) | [LinkedIn](#) | [Facebook](#) | [YouTube](#)

From: Rachel Gross <rgross@dobslegal.com>

Sent: Thursday, June 20, 2024 4:23 PM

To: Kim Bueno <Kim.Bueno@butlersnow.com>; Trey Branham <tbranham@dobslegal.com>; 'krutoski@dobslegal.com' <krutoski@dobslegal.com>; 'emoultrie@dobslegal.com' <emoultrie@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Ben Adams <badams@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; Mitch Brown <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: Re: Perry-- Court Order for MUSC Tissue

Hey Kim:

We intend to do destructive testing as well. We can assist with obtaining the tissue. In past instances where we did this in South Carolina, we had to come up with an agreement so that we can split the tissue. I can find a prior order if Blake/Mitch need me to and can send, or we can set up a time to discuss.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

<https://link.edgепilot.com/s/d6f57213/KVdNhGvHck2zr4NcJZNZQg?u=http://www.dobslegal.com/>

From: Kim Bueno <Kim.Bueno@butlersnow.com>

Date: Thursday, June 20, 2024 at 2:35 PM

To: Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, 'krutoski@dobslegal.com' <krutoski@dobslegal.com>, 'emoultrie@dobslegal.com' <emoultrie@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Ben Adams <badams@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Theile McVey <TMcVey@kassellaw.com>

Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, Mitch Brown <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>

Subject: Perry-- Court Order for MUSC Tissue

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Counsel,

Thank you for sending us the 8 stained and unstained slides that you received from MUSC. We understand there is tissue available at MUSC that would allow our expert to perform destructive testing, including a fiber digestion and/or genetic testing. We wish to do so. MUSC requires a court order to produce this tissue, either in blocks or as a specimen. Will you assist with obtaining the tissue for our review? If not, please let us know if you agree to the motion for a court order.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

D: (737) 802-1820 | C: (512) 699-3255 | F: (737) 802-1801

1400 Lavaca Street, Suite 1000, Austin, TX 78701

Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)

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Exhibit B

From: [Rachel Gross](#)
To: [Kim Bueno](#); [Theile McVey](#); [Trey Branham](#); [Kathy Felix](#); [Teresa Gilliland](#); [Ben Adams](#)
Cc: ["Blake Williams"](#); ["Mitch Brown"](#); [Chris Cowan](#); [Amy Pepke](#)
Subject: Re: Perry-- Revised Tissue Division Order
Date: Thursday, July 18, 2024 8:21:30 PM



Kim:

As previously mentioned, the order was sent to MUSC the same day that Judge Toal signed it. MUSC knows the timing and has assured me they are working as fast and quickly as they can. I think we will be fine on timing. Thanks.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | C: (214) 683-1753

www.dobslegal.com

From: Kim Bueno <Kim.Bueno@butlersnow.com>
Date: Thursday, July 18, 2024 at 8:40 AM
To: Rachel Gross <rgross@dobslegal.com>, Theile McVey <tmcvey@kassellaw.com>, Trey Branham <tbranham@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Ben Adams <badams@dobslegal.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>
Subject: RE: Perry-- Revised Tissue Division Order

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Hi Rachel,

Can you confirm whether the tissue has been split and when it will be sent to the experts? As you know, Dr. Longo testified on Tuesday that he needs 2-3 weeks to complete the digestion. If we don't have the tissue available for analysis immediately, there will not be time to complete the digestions before trial.

Thanks,
Kim

Kim Bueno
[Butler Snow LLP](#)

D: (737) 802-1820 | C: (512) 699-3255 | F: (737) 802-1801
1400 Lavaca Street, Suite 1000, Austin, TX 78701
Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)

RoA_05711

[X \(Twitter\)](#) | [LinkedIn](#) | [Facebook](#) | [YouTube](#)

From: Rachel Gross <rgross@dobslegal.com>
Sent: Sunday, July 14, 2024 12:17 AM
To: Kim Bueno <Kim.Bueno@butlersnow.com>; Theile McVey <tmcvey@kassellaw.com>; Trey Branham <tbranham@dobslegal.com>; Kathy Felix <kfelix@dobslegal.com>; Teresa Gilliland <tgilliland@dobslegal.com>; Ben Adams <badams@dobslegal.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>; Kim Bueno <Kim.Bueno@butlersnow.com>
Subject: Re: Perry-- Revised Tissue Division Order

Hi Kim:

Yes, we know the Court signed the joint order. It was sent to MUSC Judge Toal signed it. I spoke with the pathology department Friday who assured me they were speaking with Dr. Harley on Monday for the split. As soon as I hear another update I will do my best to let everyone know.

Thanks.

RACHEL A. GROSS | Attorney

O: (214) 722-5990 | **C:** (214) 683-1753

www.dobslegal.com

From: Kim Bueno <Kim.Bueno@butlersnow.com>
Date: Saturday, July 13, 2024 at 3:21 PM
To: Theile McVey <tmcvey@kassellaw.com>, Rachel Gross <rgross@dobslegal.com>, Trey Branham <tbranham@dobslegal.com>, Kathy Felix <kfelix@dobslegal.com>, Teresa Gilliland <tgilliland@dobslegal.com>, Ben Adams <badams@dobslegal.com>
Cc: 'Blake Williams' <blake.williams@nelsonmullins.com>, 'Mitch Brown' <mitch.brown@nelsonmullins.com>, Chris Cowan <Chris.Cowan@butlersnow.com>, Amy Pepke <Amy.Pepke@butlersnow.com>, Kim Bueno <Kim.Bueno@butlersnow.com>
Subject: RE: Perry-- Revised Tissue Division Order

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Counsel,

The Court issued the tissue division order. Have you sent this to MUSC? Do you have an understanding of when the tissue will be sent to Drs. Longo and Geyer?

Thanks for any update you can provide.

Have a nice weekend,

Kim

Kim Bueno

RoA_05712

Butler Snow LLP

D: (737) 802-1820 | C: (512) 699-3255 | F: (737) 802-1801

1400 Lavaca Street, Suite 1000, Austin, TX 78701

Kim.Bueno@butlersnow.com | [vCard](#) | [Bio](#)[X \(Twitter\)](#) | [LinkedIn](#) | [Facebook](#) | [YouTube](#)

From: Theile McVey <tmevey@kassellaw.com>**Sent:** Tuesday, July 9, 2024 12:09 PM**To:** Kim Bueno <Kim.Bueno@butlersnow.com>; 'Rachel Gross' <rgross@dobslegal.com>; 'Trey Branham' <tbranham@dobslegal.com>; 'Kathy Felix' <kfelix@dobslegal.com>; 'Teresa Gilliland' <tgilliland@dobslegal.com>; 'Ben Adams' <badams@dobslegal.com>**Cc:** 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>**Subject:** Re: Perry-- Revised Tissue Division Order

— —

Hey Kim, this is fine. I am traveling today so if you don't mind sending, that would be great

Get [Outlook for iOS](#)

From: Kim Bueno <Kim.Bueno@butlersnow.com>**Sent:** Tuesday, July 9, 2024 12:27:32 PM**To:** Theile McVey <tmevey@kassellaw.com>; 'Rachel Gross' <rgross@dobslegal.com>; 'Trey Branham' <tbranham@dobslegal.com>; 'Kathy Felix' <kfelix@dobslegal.com>; 'Teresa Gilliland' <tgilliland@dobslegal.com>; 'Ben Adams' <badams@dobslegal.com>**Cc:** 'Blake Williams' <blake.williams@nelsonmullins.com>; 'Mitch Brown' <mitch.brown@nelsonmullins.com>; Chris Cowan <Chris.Cowan@butlersnow.com>; Amy Pepke <Amy.Pepke@butlersnow.com>**Subject:** Perry-- Revised Tissue Division Order

Theile and team,

Attached please find a revised tissue division order. I changed paragraphs 3, 6 and 8 to substitute Dr. Geyer for Dr. Roggli. I also fixed paragraph 5 which needed to be edited with attorney information. Finally, I changed the date in paragraph 1.

If this is acceptable, you have our permission to finalize and submit to the Court. If you would prefer our side to send it, that's fine too. Happy to discuss at your convenience.

Thanks,

Kim

Kim Bueno

Butler Snow LLP

D: (737) 802-1820 | C: (512) 699-3255 | F: (737) 802-1801

1400 Lavaca Street, Suite 1000, Austin, TX 78701

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Exhibit C

STATE OF SOUTH CAROLINA
COUNTY OF RICHLAND

MICHAEL L. PERRY and
LONNIE L. LONG

Plaintiffs,

v.

AMERICAN INTERNATIONAL
INDUSTRIES; et al.,

Defendants.

IN THE COURT OF COMMON PLEAS
FOR THE FIFTH JUDICIAL CIRCUIT

Case No.: 2023-CP-40-04072

ORDER GRANTING JOINT MOTION
REQUESTING THE DIVISION OF PLAINTIFF MICHAEL L. PERRY'S TISSUE

This matter came before the Court on July 9, 2024, on the Motion of Plaintiffs and Defendants Johnson & Johnson; LLT Management, LLC, formerly known as LTL Management, LLC; Kenvue, Inc.; and Johnson & Johnson Holdco (NA) Inc. ("J&J Defendants"), requesting the division of block(s) of Plaintiff Michael L. Perry's ("Plaintiff") lung tissue.

IT IS THEREFORE ORDERED:

The Court hereby appoints the Pathology Department at the Medical University of South Carolina Department of Pathology and Laboratory Medicine, as the independent third-party, disinterested pathologists to divide block(s) of lung tissue for digestion per the protocol outlined in this Order. The assigned pathologist shall not make any diagnosis or records of any impressions.

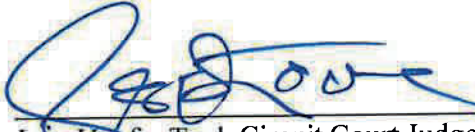
The assigned pathologist is to collect the block(s) of lung tissue of Plaintiff, under the

following conditions:

1. The assigned pathologist shall divide the lung tissue block(s) into two (2) equal parts, preserving one-half for Plaintiff and one-half for Defendants. The divided block(s) shall be as qualitatively and quantitatively equal as possible under the circumstances.

2. The assigned pathologist is to take two sets of pictures of the block(s) of lung tissue. One set of pictures will be taken before division of the block(s) and a set of pictures will be taken after division.
3. The assigned pathologist is to send the respective equal parts of the block(s), the pictures noted above, and chain of custody documentation to the following individuals:
- Stanley J. Geyer, M.D.
Geyer Pathology Services, LLC
3 Willow Farms Lane
Pittsburgh, PA 15238
(412) 406-7354
 - Kathy Molyneaux
MAS
3945 Lakefield Court
Suwanee, Georgia 80024
(770) 866-3208
4. The remainder of the lung tissue is to be returned by the assigned pathologist to Rachel Gross at:
- Dean Omar Branham Shirley, LLP
302 N. Market Street, Suite 300
Dallas, TX 75202
5. The assigned pathologist is to submit half of his/her total invoice to Attorney Rachel Gross at the address above. The other half of his/her total invoice should be directed to Attorney Kim Bueno at:
- Butler Snow LLP
1400 Lavaca Street, Suite 1000
Austin, TX 78701
6. Counsel for the respective parties are to exchange the digestion reports of Dr. Stanley J. Geyer and Dr. William Longo as soon as practical after the digestions have been performed.
7. No grids will be exchanged unless by further order of this Court upon the showing that there is some necessity for the exchange of grids.
8. If any issues arise concerning the contamination of the samples provided to Drs. Geyer and Longo after the samples are received by their facilities, said issues will be addressed at a pretrial hearing by the Court, including claims for sanctions, if any.

AND IT IS SO ORDERED.


Jean Hofer Toal, Circuit Court Judge, Chief Justice
of the S.C. Supreme Court (Retired)

Date: July 9, 2024

#13



Richland Common Pleas

Case Caption: Michael L Perry , plaintiff, et al vs American International Industries ,
defendant, et al
Case Number: 2023CP4004072
Type: Order/Other

So Ordered

Jean H. Toal

Electronically signed on 2024-07-10 08:44:06 page 4 of 4

Exhibit D

Page 1

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF RICHLAND

MICHAEL L. PERRY and

LONNIE L. LONG,

Plaintiffs,

vs.

Case No.: 2023-CP-40-04072

AMERICAN INTERNATIONAL

INDUSTRIES; et al.,

Defendants.

VIDEO TELECONFERENCE

DEPOSITION OF: WILLIAM EDWARD LONGO, Ph.D.

DATE: Tuesday, July 16, 2024

TIME: 11:48 a.m.

TIME ENDED: 3:31 p.m.

LOCATION: Suwanee, Georgia

REPORTED BY: YVONNE R. THURSTON-BOHANNON

Registered Merit Reporter,

Certified Realtime Reporter

1 control bottle in your round one testing; is that
2 right?

3 A. We've used it routinely for our
4 controls. I believe that's what that is.

5 Q. Okay. And you recall that Mr. Perry
6 testified that he when he used talcum powder,
7 each -- each part of his body as you described that
8 he would apply, he would apply a heaping
9 tablespoon. Do you recall that?

10 A. Correct. And that tells me it wasn't
11 levelled at the top. It was just in there. So to
12 be conservative I would say that was seven grams
13 for each of the three tablespoons which of course
14 gives you 21 grams which would put him in the --
15 what the -- at least Johnson & Johnson would call a
16 heavy user.

17 Q. I understand that answer, sir. I -- I
18 apologize, but we've got a lot of people going to
19 ask questions today, and I -- I asked a very simple
20 question. And I'll -- I'll ask all those
21 follow-ups, but if you could just answer the
22 question that I've asked. We have a limited time
23 today.

24 So --

25 MR. ADAMS: He did answer the question.

1 So let's just have another question without sort of
2 this speaking objection stuff. Let's just have
3 another question.

4 MR. COWAN: Ben, that was a speaking
5 objection. I asked him a question. If he would
6 mind just answering the question I asked.

7 MR. ADAMS: Okay. Next question.
8 Thanks.

9 MR. COWAN: Okay.
10 BY MR. COWAN:

11 Q. So, Dr. Longo, this Exhibit 1B, you
12 would agree that that is not a heaping tablespoon;
13 is that fair?

14 A. That's fair.

15 Q. Okay. So have you done any sort of
16 calculation as to what a heaping tablespoon would
17 be in terms of grams?

18 A. No, because it would be hard to go
19 define heaping. Is that just above? Is it above?
20 So I would prefer just to stick with this is what a
21 tablespoon is, and I would just use that number
22 versus heaping with an understanding that it would
23 be an underestimate what was actually used.

24 Q. Why did you do this measurement? I
25 know that you -- in your notes you're only relying

CERTIFICATE OF REPORTER

I, Yvonne R. Thurston-Bohannon, Registered Merit Reporter, Certified Realtime Reporter, and Notary Public for the State of South Carolina at Large, do hereby certify:

That the reading and signing of the foregoing deposition by the witness is waived.

That the foregoing transcript was taken before me on the date and at the time and location stated on page 1 of this transcript; that the deponent was duly sworn to testify to the truth, the whole truth and nothing but the truth; that the testimony of the deponent and all objections made at the time of the examination were recorded stenographically by me and were thereafter transcribed; that the foregoing deposition as typed is a true, accurate and complete record of the testimony of the deponent and of all objections made at the time of the examination to the best of my ability.

I further certify that I am neither related to nor counsel for any party to the cause pending or interested in the events thereof.

Witness my hand, I have hereunto affixed my official seal July 17, 2024, at Columbia, Richland County, South Carolina



Yvonne R. Thurston-Bohannon
Registered Merit
Reporter, CRR
My Commission expires
May 6, 2025

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	
COUNTY OF RICHLAND	)	FOR THE FIFTH JUDICIAL CIRCUIT
	)	
MICHAEL L. PERRY and	)	C/A NO. 2023-CP-40-04072
LONNIE L. LONG,	)	
	)	<i>In Re:</i>
Plaintiffs,	)	Asbestos Personal Injury Litigation
	)	Coordinated Docket
v.	)	
	)	
AMERICAN INTERNATIONAL	)	
INDUSTRIES, et al.	)	
	)	
Defendants.	)	

PLAINTIFFS' CONSOLIDATED RESPONSE IN OPPOSITION TO DEFENDANTS' MOTIONS IN LIMINE TO EXCLUDE OR LIMIT CAUSATION TESTIMONY OF PLAINTIFFS' EXPERTS WITNESSES

Plaintiffs Michael Perry and Lonnie Long, by and through the undersigned counsel, oppose Defendants' motions in limine to exclude or limit the causation testimony of Plaintiffs' expert witnesses. This is a Consolidated Response to the following motions:

- Defendant IMI Fabi (Diana) LLC, IMI Fabi (USA) Inc., and IMI Fabi, LLC's Motion in Limine No. 2 (Every Exposure); and
- Johnson & Johnson Defendants' Motion in Limine No. 2 to Exclude Each and Every Exposure/Cumulative Dose Causation Opinions.

For the reasons set forth herein, these motions should be denied. In support hereof, Plaintiffs respectfully state the following:

I. INTRODUCTION

Defendants ask this Court to preclude testimony from Plaintiffs' causation experts that "every exposure" to asbestos, any exposure, and cumulative exposure to asbestos caused Michael Perry's mesothelioma. Plaintiffs' causation experts include Dr. Steven Haber, Dr. Arnold Brody, Dr. William Longo, and Dr. David Madigan.

Contrary to Defendant's mischaracterization, Plaintiffs' experts will not offer the ultimate opinion that "any exposure" or "every asbestos fiber" or "single fiber theory" causing mesothelioma generally or caused Mr. Perry's mesothelioma. They will instead testify that mesothelioma is caused by a person's cumulative asbestos exposure. They will further testify that exposures that contribute to the cumulative dose by meeting certain well-defined criteria can be considered a substantial factor in causing the mesothelioma. Plaintiffs' experts' opinions regarding the cumulative nature of asbestos diseases and the lack of any safe threshold of exposure are not "unreliable," but are generally accepted medical facts that have been established by a significant body of peer-reviewed medical and scientific literature and have been part of the asbestos litigation since its inception.

This Court accepted these same causation opinions at the trial of *Jolly v. General Electric Co.*, No. 2016-CP-42-1592 (S.C. Com. Pl. Dec. 15, 2017) (**Ex. 1**). In *Jolly*, this Court allowed expert testimony that mesothelioma can be caused by brief or low-level cumulative exposures, finding that the plaintiffs' "experts were entitled to rely on this basic medical fact in reaching their opinion in this case." *Id.* at 30. The Court recognized that testimony about this basic medical fact is not the same thing as testimony that "each and every exposure" is a substantial factor in causing disease. *Id.* Dr. Brody's testimony was similarly allowed in the *Howe* trial in March 2018, the *Crawford* trial in July 2018, and the *Glenn* trial in January 2019.

In *Jolly*, the Court found that the plaintiffs' experts had utilized a reliable methodology in that they "relied on their many years of experience in the area of asbestos-related diseases, as well as a broad range of evidence including epidemiology and other scientific literature, the dose-response relationship, the science regarding the low levels of exposure that can cause mesothelioma, the exposure levels documented from working with gaskets and packing in the

manner described by [the plaintiff and his co-worker], and the facts surrounding [the plaintiff's] exposure to visible dust from Defendants' valves." *Id.* at 31. The Court ruled that because the experts' causation opinions were supported by the scientific literature as well as relevant exposure facts, their testimony was admissible, relevant, and helpful to the jury. *Id.* at 32.

The Court of Appeals affirmed this Court's *Jolly* Order. Considering the same arguments raised by Defendants in this matter, it ruled, "[t]o the extent Appellants challenge the admissibility of Respondents' experts' testimony on the ground that it was unreliable, *they have failed to show any significant part of the testimony that could be reasonably characterized as espousing the 'each and every exposure' theory.*" *Jolly v. General Electric*, 435 S.C. 607, 639; 869 S.E.2d 819, 836 (Ct. App. 2021) (emphasis added).

The Court of Appeals agreed with Mrs. Jolly that her "experts relied on the cumulative dose theory and that their reliance on basic science in reaching their opinions is not the equivalent of testifying that 'each and every exposure' was a substantial factor in causing Dale's mesothelioma." *Id.* at 634, 869 S.E.2d at 833-34.

The Court of Appeals also noted its disagreement with Defendants' contention that "the cumulative dose theory conflicts with the *Henderson/Lohrmann* substantial factor standard." *Id.* at 635, 869 S.E.2d at 834. "Stating that a certain exposure *contributes* to an individual's cumulative dose does not espouse the view that 'each and every breath' of asbestos is 'substantially' causative of mesothelioma or imply that one exposure meets the legal requirement for causation." *Id.* at 635-36, 869 S.E.2d at 834. "We view the testimony concerning cumulative dose as background information essential for the jury's understanding of medical causation, which must be based on science. We do not interpret this presentation as an attempt to supplant the *Henderson/Lohrmann* test." *Id.* at 636, 869 S.E.2d at 834-35.

The Court of Appeals ultimately concluded, “the cumulative dose theory on which Respondents’ experts relied *easily meets* the standard for reliability set forth in *State v. Council*, 335 S.C. 1, 515 S.E.2d 508 (1999).” *Id.* at 639, 869 S.E.2d at 836 (emphasis added). “Respondents’ experts were guided by the facts specific to Dale’s exposure to Appellants’ products in forming their opinions concerning causation.” *Id.* at 637, 869 S.E.2d at 835. Finally, the Court recognized Plaintiff’s experts relied on “numerous peer-reviewed, published epidemiological studies, case series, and case reports,” as well as other scientific criteria impacting causation of disease, and follows the weight-of-the-evidence methodology used by national and international public health organizations for evaluating the health effects of asbestos.” *Id.* at 640-41, 869 S.E.2d at 837.

South Carolina’s Court of Appeals again rejected Defendants’ attempts to conflate “cumulative dose” testimony with the “each and every exposure” theory in *Edwards v. Scapa Waycross, Inc.*, 437 S.C. 396, 878 S.E.2d 696, (Ct. App. Aug. 3, 2022).

[Defendant] Scapa argues the trial court erred in failing to grant its motion for JNOV because Stewart employed the “each and every exposure” theory of causation at trial. Scapa states that Dr. Frank explained the cumulative dose or “cumulative exposure” theory to the jury and utilized that theory in reaching his opinion as to whether Scapa’s dryer felts were a substantial factor in causing Stewart’s mesothelioma. Scapa conflates these two theories and claims they are inconsistent with the specific causation standard set forth in *Henderson*. We disagree.

“The ‘each and every exposure’ theory espouses the view that ‘each and every breath’ of asbestos is substantially causative of mesothelioma.” *Jolly*, 435 S.C. at 633, 869 S.E.2d at 833 (quoting *Rost v. Ford Motor Co.*, 151 A.3d 1032, 1044 (2016)); see also *Yates v. Ford Motor Co.*, 113 F. Supp. 3d 841, 846 (E.D.N.C. 2015) (“Also referred to as ‘any exposure’ theory, or ‘single fiber’ theory, it represents the viewpoint that, because science has failed to establish that any specific dosage of asbestos causes injury, every exposure to asbestos should be considered a cause of injury.”). This court has recently refused to conflate the cumulative dose theory with the each and every exposure theory, concluding that an expert’s opinion which states “that a certain exposure contributes to an individual’s cumulative dose does not espouse the view that ‘each and every breath’

of asbestos is ‘substantially’ causative of mesothelioma or imply that one exposure meets the legal requirement for causation.” *Jolly*, 435 S.C. at 635–36, 869 S.E.2d at 834. Rather, this court viewed testimony regarding a plaintiff’s cumulative dose as “background information essential for the jury’s understanding of medical causation, which must be based on science.” *Id.* at 636, 869 S.E.2d at 834–35.

Edwards, 437 S.C. at 416-417, 878 S.E.2d at 707.

Similarly, in *Garvin v. Agco Corp.*, Judge Hill rejected a challenge to the admissibility of the testimony of Dr. Brody. **Ex. 2**, No. 2012-CP-40-6675 (S.C. Ct. Comm. Pleas Nov. 14, 2014). The Court held that the opinions of this expert was reliable and helpful to the trier of fact. *Id.* at 21-25. The Court further determined that the opinions of these experts supported the jury’s finding that the plaintiff developed mesothelioma from breathing asbestos fibers from the defendant’s asbestos products. *Id.* at 25. He rejected the defendant’s contention that Dr. Brody held the opinion that every asbestos exposure contributes to cause disease, noting that “[t]he trial record does not contain any such testimony from any of Plaintiffs’ experts.” *Id.* at 23.

Contrary to Defendant’s assertions, Plaintiffs’ experts’ opinions regarding the cumulative nature of asbestos diseases and the lack of any safe threshold of exposure are not “unreliable,” but are generally accepted medical facts that have been established by a significant body of peer-reviewed medical and scientific literature and have been part of the asbestos litigation since its inception. As in *Jolly* and *Garvin*, the opinions of Plaintiffs’ experts are reliable and admissible expert opinion testimony. Defendants’ motions should therefore be denied.

II. LEGAL STANDARDS FOR THE ADMISSIBILITY OF EXPERT TESTIMONY

Admissibility of expert testimony is governed by South Carolina Rule of Evidence 702. “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill,

experience, training, or education, may testify thereto in the form of an opinion or otherwise.” S.C. R. Evid. 702.

Courts evaluating the admissibility of expert testimony “must find the evidence will assist the trier of fact, the expert witness is qualified, and the underlying science is reliable.” *State v. Council*, 335 S.C. 1, 20, 515 S.E.2d 508 (S.C. 1999). The reliability of scientific evidence is evaluated based on several factors, including: (1) the publications and peer review of the technique; (2) prior application of the method to the type of evidence involved in the case; (3) the quality control procedures used to ensure reliability; and (4) the consistency of the method with recognized scientific laws and procedures. *State v. White*, 382 S.C. 265, 274, 676 S.E.2d 684 (S.C. 2009) (citing *Council*, 335 S.C. at 19).

Importantly, the trial court’s gatekeeper role is not intended to replace the adversary system. *See Maiz v. Virani*, 253 F.3d 641, 666 (11th Cir. 2001). Rather, “cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof” are the ordinary means to attack an opposing expert. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 596 (1993).

Courts should not exercise their gatekeeping responsibility by excluding expert testimony that falls within the range of matters on which reasonable experts can disagree. *See Milward v. Acuity Specialty Prods. Group, Inc.*, 639 F.3d 11, 22 (1st Cir. 2011). Trial courts are not “empowered ‘to determine which of several competing scientific theories has the best provenance.’” *Id.* at 15 (quoting *Ruiz-Troche v. Pepsi Cola of P.R. Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998)). While the trial court may look at the reliability of the expert’s methodology, it is for the jury to determine the soundness of the facts underlying the expert’s opinion and the correctness of the expert’s conclusions. *See id.* 22. Moreover, the entire body of evidence relied

on by the expert should be taken into consideration in evaluating the reliability of the opinion, and the court should refrain from an “atomistic” approach that determines that each piece of evidence is insufficient, on its own, to support the expert’s conclusion. *Id.* The mere fact that an expert’s methodology requires the application of scientific judgment does not render that method unreliable. *See id.* at 18.

Plaintiffs’ experts’ opinions are reliable, and supported by a wealth of scientific and medical evidence that scientists in their fields rely on. Defendants simply disagree with the conclusions they draw from that evidence. Such disagreement may be explored during cross-examination at trial but does not warrant excluding the experts’ conclusions under Rule 702.

A. The Qualifications and Conclusions of Plaintiffs’ Experts

1. Dr. Arnold Brody’s Qualifications and Opinions.

Dr. Brody is a cell biologist who specializes in lung pathology, or the biology of disease. **Ex. 3**, Brody Depo., *Voelker v. Alfa Laval, Inc.*, 5/8/15, at 7:12-18, 8:20-23, 22:9-12. He worked and studied with Dr. J.C. Wagner, who in 1960 published the seminal study establishing that asbestos causes mesothelioma. *Id.* at 9:22-10:19. Dr. Brody studied how asbestos causes disease with Dr. Wagner, and that topic became the focus of Dr. Brody’s research for the next several decades. *Id.* at 10:15-19. He studied how asbestos causes disease for 15 years at the National Institute for Environmental Health, a federally funded laboratory, and thereafter as a professor in the departments of pathology and environmental health sciences at Tulane University. *Id.* at 11:21-13:20. At Tulane, his work was supported almost entirely by grants from the National Institutes of Health. *Id.* at 13:7-14:23. He has published 153 peer-reviewed articles, and about 110 or 120 of them are on asbestos disease. *Id.* at 14:24-16:25.

The purpose of Dr. Brody's testimony is to educate the jury about the manner in which asbestos causes disease on a cellular level and which types of asbestos can cause the cellular changes that can lead to disease. For a number of years, Dr. Brody has testified in courtrooms throughout the United States about the mechanical pathways that lead to the causation of asbestos-related diseases. His testimony has not changed, is routinely accepted, and is rarely challenged. He is one of the most universally respected and well-known expert witnesses by either the plaintiff or defense bars. In fact, in the past former defendants have hired him to give the same testimony about the causation of asbestos disease that he gives for plaintiffs. **Ex. 3**, at 21:10-24.

Dr. Brody will not testify that all exposures to asbestos cause mesothelioma. Instead, he opines, "if you have a level of asbestos exposure above background for, you know, weeks, months, whatever, it could be a brief exposure, that my opinion is enough to cause genetic errors and start a disease process." **Ex. 4**, Brody Dep., *Bodine v. 3M Company*, 11/13/14, at 29:7-12. Dr. Brody believes that every exposure above background is part of the cumulative exposure that causes the disease, but he does not believe that isolated or minimal exposures contribute. He explained that "multiple days in a setting where we know that there are exposures above background, that would contribute. So the walk-through, I wouldn't say contributes and it never has." *Id.* at 35:6-10. His reference to a "walk-through" was in response to a question about whether merely walking through an automotive garage would be a causative exposure, and Dr. Brody testified that it would not be:

- Q. So if the person who has the eight weeks of exposure 30 years later develops mesothelioma, and prior to that eight weeks of exposure walks through a garage where there is brake work going on or friction work going on, I think you would tell me that contributed to his mesothelioma?
- A. I think you're putting words in my mouth. I wouldn't say that walking through a passive brake job contributes. I would never say that. **My** testimony is that you have to be exposed days, weeks, typically months or more for that to be a contributing factor. So walking through doesn't mean anything to me.

Id. at 33:19-34:10.

Dr. Brody follows the Helsinki criteria in attributing a particular mesothelioma to asbestos exposure. Brody Dep., **Ex. 3**, at 68:24-69:11. The Helsinki criteria, established by an international group of experts in asbestos diseases in 1997, and reaffirmed in 2014, allows attribution based on a documented history of asbestos exposure. *Id.* at 69:12-24.

Dr. Brody testifies that all asbestos diseases, including mesothelioma, are dose-response diseases. This means the more a person is exposed, the more likely he or she is to develop the disease. **Ex. 3**, at 71:20-72:1. The cumulative dose is defined as that amount of asbestos fibers that accumulate in the lungs over the years, and “the more that accumulates, the more likely you are to get a cancer.” *Id.* at 72:14-22. Scientists have not established a “safe” level of exposure to asbestos, and there is no known threshold below which mesothelioma will not occur. *Id.* at 73:21-74:4.

In *Edwards, supra*, the Court of Appeals explicitly considered Dr. Brody’s opinions in the same context as argued by Defendants in this case. Rejecting Defendants’ arguments that Dr. Brody’s opinions are unreliable, the Court of Appeals determined,

We find Stewart presented sufficient evidence to prove general causation. *See Jolly*, 435 S.C. at 625, 869 S.E.2d at 828 (“General causation is whether a substance is capable of causing a particular injury or condition in the general population.”). Dr. Arnold Brody, Stewart’s expert pathologist whose career focused on lung cell biology, explained that chrysotile asbestos fibers, the asbestos Scapa used to manufacture its dryer felts, are capable of reaching a human’s lungs after a breath of air. He noted that chrysotile asbestos, like all other forms, is toxic and can cause mesothelioma once it reaches the pleural mesothelial cells surrounding the lungs. He also stated that individuals who are exposed to asbestos at levels above background (the amount in the air) for extended periods of time have an increased risk of developing mesothelioma.

Edwards, 473 S.C. at 413, 878 S.E. 2d at 705.

The *Jolly* Court also referenced Dr. Brody's testimony without criticism, finding that combined with the Jollys' other experts, it provided sufficient evidence to meet South Carolina's causation standard. In doing so, the Court summarized Dr. Brody's opinions as follows.

Dr. Arnold Brody, a cell biologist, testified concerning how the inhalation of asbestos causes mesothelioma. Dr. Brody explained that there is a consensus in the scientific community that all of the commercial varieties of asbestos fibers "cause all of the asbestos diseases." He also explained that whether an individual develops a disease from his or her exposure depends on the dose and that individual's personal susceptibility based on the response of his or her genetic defenses, and for mesothelioma, there is no known threshold or level above background levels that is known to be "safe or [that] will not cause mesothelioma."

Jolly, 435 S.C. at 632, 869 S.E.2d at 832. In this case, Dr. Brody will offer substantially similar opinions as to those deemed appropriate by the Court of Appeals in *Jolly*.

The federal asbestos MDL in the Eastern District of Pennsylvania has also found Dr. Brody's opinions reliable and admissible. **Ex. 5**, *Larson v. Bondex Int'l*, No. 09-69123, 2010 WL 4676563 (E.D. Penn. Nov. 15, 2010). In rejecting a challenge to the reliability of Dr. Brody's general causation opinions, Judge Eduardo Robreno determined that Dr. Brody's testimony about the manner in which asbestos causes disease was supported by "scientific investigations on humans and correlative animal and cell studies' confirming the relationship between asbestos fibers and four asbestos-related diseases discussed," including 146 peer-reviewed publications and fifty book chapters authored or co-authored by Dr. Brody. *Id.* at *2-3 (citing Magistrate Judge Angell's Memorandum Opinion). Judge Robreno therefore held that, "[g]iven the purpose of Dr. Brody's testimony, to assist the jury in understanding the relationship between exposure to asbestos fibers and disease processes generally, and the breadth of peer-reviewed publications relied on," his testimony is reliable under Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals Inc.*, 509 U.S. 579 (1993). *Id.* at *4.

Dr. Brody's testimony has also been admitted as reliable and admissible by other courts

across the country. *See, e.g., Jack v. Borg-Warner Morse TEC LLC*, No. C17-0537JLR, 2018 WL 3819027, at *16-17 (W.D. Wa. Aug. 10, 2018); *Waite v. AII Acquisition Corp.*, 194 F. Supp. 3d 1298, 1315 (S.D. Fla. 2016); *Rabovsky v. Air & Liquid Sys. Corp.*, No. CIV.A. 10-3202, 2012 WL 876752, at *3 (E.D. Pa. Mar. 13, 2012); *In re Asbestos Prod. Liab. Litig. (No. VI) (Rabovsky)*, No. 10-CV-03202, 2012 WL 252919, at *1 (E.D. Pa. Jan. 25, 2012); *Rost v. Ford Motor Co.*, 151 A.3d 1032, 1045 (Pa. 2016); *Startley v. Welco Mfg. Co.*, 78 N.E.3d 639, 647 (Ill. Ct. App. 2017); *Hennegan v. Cooper/T. Smith Stevedoring Co.*, 837 So. 2d 96, 105-06, 110 (La. Ct. App. 2002).

2. Dr. Steven Haber's Qualifications and Opinions

Dr. Haber is a practicing physician Board Certified in Internal Medicine with a subspecialty of Pulmonary Diseases.¹ He has diagnosed and managed patients with a variety of occupational pulmonary diseases, including patients with mesothelioma.² He has published in peer-reviewed medical journals, including on mesothelioma.³ Dr. Haber must understand disease causation for his diagnostic duties. Pulmonologists face diagnostic situations with a broad differential diagnosis (the number of potential diseases consistent with the patient).⁴ To focus diagnostic investigation, Dr. Haber often takes comprehensive occupational and exposure histories.⁵ With asbestos-related diseases, the ability to use information from an occupational and exposure history requires pulmonologists like Dr. Haber to have an understanding of industrial hygiene, toxicology, chemistry, geology, mineralogy and epidemiology.⁶

a. Dr. Haber's general causation opinions.

Dr. Haber (a) extensively reviewed the epidemiologic evidence⁷ and (b) broadly considered

¹ Ex. 6, Dr. Haber *curriculum vitae*; Ex. 7, Dr. Haber report 6/11/2021 at pgs. 1-2.

² Ex. 7, Dr. Haber report 6/11/2021 at pgs. 1-2.

³ Ex. 7, Dr. Haber report 6/11/2021 at pgs. 1-2.

⁴ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pgs. 1-2.

⁵ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pgs. 1-2.

⁶ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pgs. 1-2.

⁷ Ex. 9, Dr. Haber report 11/8/2023 – Exhibit C (containing references that he reviewed).

“the current medical and scientific evidence about the health effects of asbestos, including epidemiological evidence, animal studies, case reports, fiber burden analyses and laboratory testing.”⁸ He recognizes that all asbestos fiber types “induce oxidative stress, inflammatory response, genetic changes, epigenetic alterations and cellular toxicity and tissue injuries in target cells in vitro and tissues in vivo.”⁹ Dr. Haber opines that (a) all asbestos fiber types cause mesothelioma¹⁰ and (b) talc containing asbestos fibers causes mesothelioma.¹¹

- b. Dr. Haber’s methodology for evaluating whether the dose from a particular product was a substantial factor.

To evaluate what constitutes a “substantial factor,” Dr. Haber’s methodology involves:

I rely on, and I have considered, the various sources of information contained and discussed in this report (including Exhibits B and C) regarding (a) the source talc in the specific products identified, when available, (b) the concentration of asbestos in the talc in the specific products identified, (c) the quantity of talc typically used during different applications of cosmetic talc products, and (d) the airborne concentration of asbestos that has been shown to result from the ordinary application of cosmetic talc products as reported in the literature and other well conducted analyses (e.g., Steffen 2020, Gordon 2014, MAS analyses, MVA analyses).

Just as I do (and the mainstream scientific community does) with any other asbestos-containing product, I make a qualitative evaluation and comparison enough of such reported results to the exposure scenarios described, considering the described application process, the concentration of asbestos in the product, and other factors. Along with such information, I evaluate the onset, duration, frequency, regularity, intensity, nature, and proximity of exposures to each specific product, making a qualitative assessment of the exposure and dose relative to the peer-reviewed scientific literature, including epidemiological literature, on the asbestos exposures shown to cause pleural and peritoneal mesothelioma. As discussed elsewhere in this report (including Exhibits B and C), the scientific

⁸ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pg. 2.

⁹ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pg. 3.

¹⁰ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pgs. 2 (#1-2), 8.

¹¹ Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pg. 2 (#2-3).

community generally accepts that relatively low doses of asbestos exposure can and do cause pleural and peritoneal mesothelioma.¹²

c. Dr. Haber performs a qualitative assessment.

In his report, Dr. Haber notes that he relies on:

the various sources of information contained and discussed in this affidavit (including Exhibits B & C) regarding (a) the source talc in the specific products identified, when available, (b) the concentration of asbestos in the talc in the specific products identified, (c) the quantity of talc typically used during different applications of cosmetic talc products, and (d) the airborne concentration of asbestos that has been shown to result from the ordinary application of cosmetic talc products as reported in the literature and other well conducted analyses (e.g., Steffan 2020, Gordon 2014, MAS analyses, MVA analyses).¹³

As with does the mainstream scientific community with asbestos-containing products, Dr. Haber makes a “qualitative evaluation and comparison enough of such reported results to the exposure scenarios described, considering the described application process, the concentration of asbestos in the product, and other factors.”¹⁴ He evaluates the onset, duration, frequency, regularity, intensity, nature, and proximity of exposures to each specific product and makes a qualitative assessment of exposure and dose “relative to the peer-reviewed scientific literature, including epidemiological literature, on the asbestos exposures shown to cause pleural and peritoneal mesothelioma.”¹⁵

3. Dr. William Longo’s Qualifications and Opinions

William Longo, Ph.D. is an expert in material science and engineering. He has a Bachelor of Science degree in Microbiology, a Master of Science degree in Engineering and a Doctorate in Materials Science from the University of Florida. He is or has been a member of numerous organizations and professional groups related to the testing and analysis of materials, including

¹² Ex. 8, Dr. Haber (Exhibit D) Johnson & Johnson General Report 10/27/2023 at pg. 22.

¹³ Ex. 10, Haber Report, 3/30/23, at pg. 30.

¹⁴ Id.

¹⁵ Id.

asbestos-containing products. Such memberships include serving on the former Environmental Protection Agency (EPA) Peer Review Group for their Asbestos Engineering Program, the American Industrial Hygiene Association (AIHA), Materials Research Society, American Society for the Testing of Materials (ASTM), and the American Society of Materials.¹⁶ Dr. Longo was selected to serve on the EPA peer review group for their asbestos screening program, and to provide guidance to the EPA on the proper methodologies for testing samples for asbestos.¹⁷ He was further selected to serve on a second EPA committee to determine the asbestos concentrations per area of building dust.¹⁸ He has been hired by the states of New York and New Jersey to analyze the asbestos in their public buildings by means of PLM and TEM.¹⁹

Dr. Longo is currently employed as the CEO at MAS where he has worked for three decades.²⁰ MAS has employees with expert knowledge in a broad range of fields including material sciences, organic & inorganic chemistry, physics, biology, microbiology, industrial hygiene, geology, and all types of microscopy. At MAS, he has studied the content, type, and release of asbestos fibers from asbestos-containing products, and for three decades has spent a significant amount of his time studying numerous aspects of asbestos analysis.²¹

MAS is accredited by the American Industrial Hygiene Association for measurement of asbestos fibers by Phase Contrast Microscopy (PCM) and for the analysis of bulk samples of asbestos, as well as being accredited by the American Association for Laboratory Accreditation A2LA for analysis of Asbestos in Cosmetic Talc Products by PLM (Blount prep method using

¹⁶ **Ex. 11**, Declaration of Dr. Longo, *Prudencio v. Johnson & Johnson* (5/13/21) (“Longo Prudencio Dec.”), p. 2, para. 4

¹⁷ **Ex. 12**, Transcript of Proceedings, *In Re Johnson & Johnson Powder Products Marketing, Sales Practices* (“J&J Daubert Hearing”) at 448-449.

¹⁸ **Ex. 12**, J&J Daubert Hearing, p. 449-450; **Ex. 11**, Longo *Prudencio* Decl., p. 2, para. 5.

¹⁹ **Ex. 12**, J&J Daubert Hearing at 457-458.

²⁰ **Ex. 12**, J&J Daubert Hearing at 440-441.

²¹ **Ex. 11**, Longo *Prudencio* Decl., p. 2, para. para. 6.

heavy liquid separation by PLM (ISO 22262-1) and TEM (ISO 22262-2).²² MAS has analyzed approximately 400,000 asbestos samples including many thousands of air samples. *Id.* at para. 7.

In addition to the routine analysis of air samples for asbestos, MAS has performed well over two hundred work practice simulations that involve the measurement of airborne asbestos fibers from the use of various asbestos containing products, including the application to the body of talcum products.²³

Dr. Longo was invited as a Speaker to the U.S. Congressional Subcommittee on Economic and Consumer Policy at a hearing on December 10, 2019, that was entitled “Examining Carcinogens in talc and the Best Methods for Asbestos for Detection.” His work and presentation influenced the Subcommittee to recommend that the FDA use the heavy liquid separation method as “the most sensitive testing method to detect carcinogenic asbestos in consumer talc-based products.”²⁴ Dr. Longo has published numerous articles about the analysis and testing of asbestos-containing materials, including the quantification of asbestos particles released upon manipulation in the manner performed in the work environment. His research regarding the analysis of cosmetic talcum powder products, including asbestos content and releasability upon use, has been published in the peer-reviewed literature.²⁵

Dr. Longo’s methodology to detect asbestos in cosmetic talc products has been vetted and approved by courts across the country. In *Ingham* in St. Louis, Missouri, the court found that Dr. Longo used methods that were published in the peer-reviewed literature that are generally accepted by the scientific community, testable, reliable, and included a protocol for extrapolating results.²⁶

²² Ex. 11, Longo *Prudencio* Decl., p. 2, para. 6.

²³ Ex. 13, Declaration of William Longo, Ph.D., *Anderson v. Avon Products, Inc.*, at paras. 4, 56, 58.

²⁴ Ex. 14, Letter, Krishnamoorthi to Hahn (3/3/20) at 4.

²⁵ Ex. 15, Steffen, Serous Ovarian Cancer Caused by Exposure to Asbestos and Fibrous Talc in Cosmetic Talc Powders – A Case Series (2020).

²⁶ Ex. 16, Order, *Ingham v. Johnson & Johnson* (6/4/18) at 4-5.

In denying a similar motion to exclude Dr. Longo's testimony in *Henry*, the Court recognized that the methodology Dr. Longo employed has been recognized by Dr. Blount, a consultant for Johnson & Johnson, defense expert Dr. Matthew Sanchez and his employer R.J. Lee as well as the International Standards Organization.²⁷

In *Blinkinsop*, the court denied challenges to Dr. Longo's testing methodology on the grounds that they go to the weight and not the admissibility of Dr. Longo's opinions.²⁸ In *Zimmerman*, the court conducted a California Evidence Code 402 Hearing and denied Defendant's motion *in limine* finding that Dr. Longo established that his method and his preparation technique were not new and that other experts in the field rely upon it.²⁹ More recently, after hearing Dr. Longo testify in detail at trial regarding his methodology and analysis, and after considering the testimony of defense experts Lee Poye and Alan Seagrave, a California trial court overruled Avon's critiques of Dr. Longo's findings.³⁰

Dr. Longo's testing reveals the routine presence of asbestos, primarily anthophyllite, actinolite, tremolite, and chrysotile in the talc sources used by Defendants. His methods are accepted, and his findings are in line with what is expected as common impurities in talc.³¹

Dr. Longo's testing is also supported by numerous other scientists, regulatory agencies, all of which have found asbestos in J&J talc products, source mines, or other products using the same talc as J&J.³²

²⁷ **Ex. 17**, excerpt Transcript of Proceedings, *Henry v. Brenntag* (9/14/18) at 86.

²⁸ **Ex. 18**, Notice of Ruling on Defendants' Motions in Limine, *Blinkinsop v. Albertsons Companies, Inc.* (2/26/19) at 3.

²⁹ **Ex. 19**, Transcript of Trial Proceedings, *Zimmerman v. Whittaker Clark & Daniels* (4/22/21) at 2143.

³⁰ **Ex. 20**, excerpt of Transcript of Proceedings, *Chapman v. Avon Products, Inc.* (12/12/22) at 55-57.

³¹ See e.g., **Ex. 21**, Johnson & Johnson Baby Products Company correspondence from W. Ashton to J.P. Grange, Subject: Talc Asbestos, L. Paoletti (9/26/84) with attached Paoletti, et al., *Evaluation of Electron Microscopy Techniques of Asbestos Contamination in Industrial, Cosmetic, and Pharmaceutical Talcs* (1984) (noting that the tremolite, anthophyllite, and chrysotile are among the minerals most associated with talc in natural deposits).

³² **Ex. 22**, Decades of Evidence summary chart, **Ex. 23**, Bird, A Review of the Talc Industry's Influence on Federal Regulation and Scientific Standards for Asbestos in Talc. **Ex. 24**, Chart of Johnson & Johnson Positive Testing.

4. Statistician Dr. David Madigan

Dr. Madigan's report (a) responds to arguments of J&J's witnesses, including temporal patterns of asbestos and talc usage and J&J's erroneous argument that age acts as an independent risk factor for mesothelioma,³³ (b) performs a statistical analysis of the likelihood of asbestos in JBP based on the number of positive and non-detects in a set of JBP samples³⁴ and (c) conducts a Bradford Hill analysis,³⁵ a generally-recognized method for evaluating general causation. Dr. Madigan opines that "there is sufficient evidence that lifetime asbestos exposures as found in regular use of cosmetic talc can cause or contribute to the development of" mesothelioma.³⁶

Dr. Madigan's epidemiologic analysis and opinions are generally accepted. Renowned epidemiologist Dr. Kanarek conducted a Bradford Hill analysis and concluded that there exists "compelling evidence that asbestos in talcum powder is causative for mesothelioma."³⁷ IARC, an authoritative scientific body, concluded in 2012 that "talc containing asbestiform fibers" can cause mesothelioma.³⁸ In 2015, the Italian Consensus Conference found "epidemiologic studies and case reports ... underlined the causal role of talc containing asbestos fibers."³⁹

III. ARGUMENT and AUTHORITIES

A. Plaintiffs' experts' causation conclusions are based on reliable science and are generally accepted in the scientific community.

Plaintiffs' experts' conclusions causation opinions are well-grounded in medicine and science and are accepted as the consensus causation opinion by the vast majority of the medical

³³ **Ex. 25**, Dr. Madigan report "Asbestos and Mesothelioma" 4/1/2023; **Ex. 26**, Dr. Madigan report "Talc, Asbestos and Mesothelioma" 9/1/2023.

³⁴ **Ex. 27**, Dr. Madigan report "Talc and Asbestos – J&J" 9/21/2021.

³⁵ **Ex. 26**, Dr. Madigan report "Talc, Asbestos and Mesothelioma" 9/1/2023.

³⁶ **Ex. 26**, Dr. Madigan report "Talc, Asbestos and Mesothelioma" 9/1/2023 at ¶ 69.

³⁷ **Ex. 28**, Kanarek, Asbestos in Talc and Mesothelioma: Review of the Causality Using Epidemiology, Med. Res. Archives, Vol. 8 (5): 2020.

³⁸ **Ex. 29**, IARC Monograph "Asbestos" 2012 at pgs. 219, 234, 280, 293, 294.

³⁹ **Ex. 30**, Magnani, "Italian Consensus Conference on Malignant Mesothelioma of the Pleura. Epidemiology, Public Health and Occupational Medicine Related Issues," Med Lav 2015; 106, 5:325-332 at 328.

and scientific communities. This includes government agencies and independent experts from numerous national and international institutions. The relevance and reliability of their opinions are such that they should be permitted to assist the jury in formulating their conclusions regarding the responsibility for Plaintiffs' injuries.

Mesothelioma is a signal tumor for exposure to asbestos. The connection between the agent and the result is so strong that medical science has been unable to determine a threshold or minimum level of exposure to asbestos that has not been shown to cause mesothelioma. Accordingly, while a few cases of mesothelioma do develop in the presence of only environmental or ambient levels of asbestos, 90% or more are properly attributed to exposures to asbestos in excess of background levels. Given the undeniable link between exposure to asbestos and mesothelioma, universally accepted attribution criteria acknowledge that "a history of significant occupational, domestic, or environmental exposure to asbestos will suffice for attribution." **Ex. 31**, *Consensus Report: Asbestos, asbestosis, and cancer: the Helsinki criteria for diagnosis and attribution*, SCAND J WORK ENVIRON HEALTH, 23:311-6 (1997) ("Consensus Report").

In January of 1997, a group of 19 experts from 8 different countries met in Helsinki, Finland "to discuss disorders of the lung and pleura in association with asbestos and to agree upon state-of-the-art criteria for their diagnosis and attribution with respect to asbestos." These experts included pathologists, radiologists, occupational and pulmonary physicians, epidemiologists, toxicologists, industrial hygienists, and clinical and laboratory scientists specializing in tissue fiber analysis. Collectively, the group "published over 1000 articles on asbestos and associated disorders." In rendering criteria on the attribution of mesothelioma, the Consensus Panel considered the following generally accepted concepts regarding mesothelioma:

- The great majority of mesotheliomas are due to asbestos exposure.

- Mesothelioma can occur in cases with low asbestos exposure. However, very low background environmental exposures carry only an extremely low risk.
- About 80% of mesothelioma patients have had some occupational exposure to asbestos, and therefore a careful occupational and environmental history should be taken.
- An occupational history of brief or low-level exposure should be considered sufficient for mesothelioma to be designated as occupationally related.
- A minimum of 10 years from the first exposure is required to attribute the mesothelioma to asbestos exposure, though in most cases the latency interval is longer (e.g., on the order of 30 to 40 years).

Ex. 31, at 313. Relying on these medical facts, the Consensus Panel concluded that “a history of significant occupational, domestic, or environmental exposure to asbestos will suffice for attribution.” *Id.* These conclusions were reaffirmed by these same international experts in 2014.

Ex. 32, *Consensus Report: Asbestos, asbestosis, and cancer: the Helsinki criteria for diagnosis and attribution 2014*, Scand J Work Environ Health, 41(1):5-15 (2014) (“Consensus Report 2014”).

Significantly, the Helsinki Criteria does not require a quantitative estimate of a patient’s asbestos “dose” exceeding some undefined level in order to attribute mesothelioma to a given asbestos exposure. In order for a doctor to conclude that a mesothelioma is asbestos related, there needs to be evidence (such as a patient interview or lay testimony) that the mesothelioma patient breathed asbestos fibers in an occupational, paraoccupational, domestic, or similar setting.

Plaintiffs’ experts’ opinions that exposures meeting certain criteria contribute to the aggregate dose that ultimately caused the plaintiffs’ or decedents’ mesotheliomas is premised on the Consensus Report and built on a foundation of well-established medical facts. Such facts include that there is no threshold level of exposure to asbestos above the miniscule level of asbestos in the ambient air that has been clearly shown not to cause mesothelioma, that mesothelioma is a

dose-response disease, and that there is an inverse relationship between dose and latency – the higher the dose, the shorter the latency period, conversely, the lower the dose, the longer the latency period. As succinctly stated by the U.S. Environmental Protection Agency (“EPA”): “Because asbestos fibers remain in the body, each exposure increases the likelihood of developing an asbestos-related disease.” **Ex. 33**, *Guide for Ship Scrappers: Tips for Regulatory Compliance*, p. 2-6 (Summer 2000).

The Occupation Safety and Health Commission reiterated the same facts of medical causation: “Asbestos exposures as short as in duration as a few days have caused mesothelioma in humans. Every occupational exposure to asbestos can cause injury of disease; every occupational exposure to asbestos contributes to the risk of getting an asbestos-related disease.” **Ex. 34**, OSHA Website, Safety and Health Topics: Asbestos, <https://www.osha.gov/SLTC/asbestos>, last visited 2/10/23.

Numerous other federal and international agencies have concluded that there is no known safe level of asbestos exposure. These include the World Health Organization (“WHO”), the International Agency for Research on Cancer (“IARC”), the EPA, The National Cancer Institute (“NCI”), the National Institutes of Occupational Safety and Health (“NIOSH”), and the Consumer Products Safety Commission (“CPSC”). For example, IARC (part of the World Health Organization) has stated that “[a]t present, it is not possible to assess whether there is a level of exposure in humans below which an increased risk of cancer would not occur.” **Ex. 35**, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 14, Asbestos, § 5.2. The Agency has also noted that mesotheliomas “occur in individuals living in the neighborhood of asbestos factories and crocidolite mines and in household contacts of asbestos workers.” *Id.*

The National Cancer Institute notes that, “[a]lthough it is clear that the health risks from asbestos exposure increase with heavier exposure and longer exposure time, investigators have found asbestos-related diseases in individuals with only brief exposures.” **Ex. 36**, National Cancer Institute Mesothelioma Fact Sheet, at 2.⁴⁰

The National Institute for Occupational Safety and Health (“NIOSH”), part of the Center for Disease Control within the U.S. Department of Health and Human Services, has long held the view that there is no safe threshold for exposure to asbestos. As early as 1976, NIOSH had noted: “Excessive cancer risks have been demonstrated at all fiber concentrations studied to date. Evaluation of all available human data provides no evidence for a threshold or for a ‘safe’ level of asbestos exposure.” **Ex. 37**, NIOSH Revised Recommended Asbestos Standard 1976, pg. 92. Further, NIOSH states, “the [exposure] standard should be set at the lowest level detectable by available analytical techniques, an approach consistent with NIOSH’s most recent recommendations for other carcinogens (ie, arsenic and vinyl chloride).” *Id.* at 93.

The World Health Organization states that “[n]o safe [exposure] level can be proposed for asbestos because a threshold is not known to exist. Exposure therefore should be kept as low as possible.” **Ex. 38**, WHO Air Quality Guidelines, Chapter 6.2 Asbestos, at 11.

The absence of a known threshold of asbestos exposure for mesothelioma risk led the U.S. Consumer Product Safety Commission to ban the use of asbestos in drywall taping and spackling compounds in 1977. “The Commission noted that in the scientific literature there is general agreement that there is no known threshold level below which exposure to respirable free-form asbestos would be considered safe.” **Ex. 39**, CPSC Ban of Consumer Patching Compounds Containing Respirable Free-Form Asbestos, 16 CFR Ch. 11 § 1304.5 (Dec. 15, 1997 ed.).

⁴⁰ <https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/asbestos/asbestos-fact-sheet> – last visited 2/10/23.

The findings of these regulatory agencies are supported by voluminous scientific literature establishing that there is no threshold below which there is no risk from exposure to asbestos. *See, e.g., Ex. 40*, Landrigan et al., *The Hazards of Chrysotile Asbestos: A Critical Review*, IND HEALTH 37:271-280, 275 (1999); *Ex. 41*, Hillerdal, *Mesothelioma: Cases Associated with Non-Occupational and Low Dose Exposures*, OCCUP ENVIRON MED 56:505-513, 510 (1999).

Dr. Laura Welch and 51 other scientists, researchers and medical professionals representing “hundreds of years of experience researching, diagnosing, and treating asbestos-related disease in workers and their families,” published a paper outlining the consensus of the mainstream scientific community regarding the causation of asbestos-related disease. *Ex. 42*, Welch, *Asbestos Exposure Causes Mesothelioma, But Not This Asbestos Exposure: An Amicus Brief to the Michigan Supreme Court*, INT J OCCUP ENVIRON HEALTH 13:318-327 (2007). These fifty-two independent experts explained that, “[t]he mainstream scientific community has long recognized and continues to recognize today that there is no ‘safe’ level of exposure to asbestos.” *Id.* at 319. The scientists concluded that, “the consensus of the scientific community is that any occupational or para-occupational exposure to asbestos - even ‘brief or low-level exposures’ - must be considered causal in an individual with a mesothelioma.” *Id.* at 321.

As a group of 58 specialists in asbestos-related disease recently wrote to the Pennsylvania Supreme Court, “[i]t is indeed an irrefutable scientific fact that each exposure does actually contribute to a person’s total dose and to that person’s risk or probability of developing mesothelioma and other cancers. This is scientific fact.” *Ex. 43*, *Joyce Rost v. Ford Motor Company*, No. 56 EAP 2014 (Pa. April 7, 2015) (*Amicus Cureiae* signed by 58 physicians and scientists in Support of Appellees).

“Low level” and “short-term” asbestos exposures have been repeatedly shown to cause mesothelioma in the peer-reviewed scientific literature. For example, in large epidemiological study conducted in France, the authors found that, “[a] significant excess of mesothelioma was observed for levels of cumulative exposure that were probably far below the limits adopted in many industrial countries during the 1980s.” **Ex. 44**, Iwatsubo, et al, *Pleural Mesothelioma: Dose-Response Relation at Low Levels of Asbestos Exposure in a French Population-based Case-Control Study*, AM J EPID 148(2):122-142 (1998). The authors documented that cumulative intermittent exposures as low as 0.5 fiber years resulted in a four-fold increase in the risk of mesothelioma with a 95% CI of 1.7-9.7. *See id.* at 7. The Iwatsubo study found that the risk of developing mesothelioma increased as the intensity of exposure increased. *Id.* For continuous exposure resulting in a cumulative dose of between 0.5 and 0.99 f/cc, the authors recorded a relative risk of 4.6 (95% CI 1.4-15.4). *Id.*

The findings of Iwatsubo were replicated by Dr. Rodelsperger and his colleagues, who observed a “distinct dose-response relationship even at levels of cumulative exposure below 1 fiber year.” **Ex. 45**, Rodelsperger et al., *Asbestos and Man-Made Vitreous Fibers as Risk Factors for Diffuse Malignant Mesothelioma: Results From a German Hospital-Based Case-Control Study*, AM J INDUS MED 39: 262-275, 262 (2001). Specifically, Rodelsperger calculated an odds ratio of 7.9 (CI 2.1-30.0) for cumulative exposures of greater than 0.00 up to 0.15 f/cc-years. Rodelsperger, *supra*, at 269, Table VII.

Another French population-based case-control study conducted from 1998 to 2002, similarly found a significant dose-response relationship at relatively low cumulative dose, reporting an odds ratio of 2.8 (95% CI 1.7-4.7) for exposures between 0 and 0.07 fibers/ml-years.

Ex. 46, Rolland, *Risk of pleural mesothelioma: A French population-based case-control study (1998-2002)* (Oct. 20, 2006).

A study by LaCourt, et al. recently corroborated these prior studies, finding a four-fold risk of pleural mesothelioma (CI 1.9 to 8.3) at exposures between $>0 - 0.1$ f/mL-year, and an 8.3 odds ratio at between $>.1 - 1$ f/mL years (CI 3.8 to 17.7). **Ex. 47**, A. Lacourt et al., *Occupational and non-occupational attributable risk of asbestos exposure for malignant pleural mesothelioma*, Thorax, published online, at Table 4 (Feb. 7, 2014). The authors noted that chrysotile was the most commonly used asbestos fiber type in the products used by those in the cohort, and that the sources of asbestos exposure included workers in the “shipbuilding and repair industry.” *Id.* at 4.

Many of these studies are discussed and summarized by Dr. Markowitz in his recent article, *Asbestos-Related Lung Cancer and Malignant Mesothelioma of the Pleura: Selected Current Issues*, Semin Respir Crit Care Med 36:334-346, 336, Table 1 (2015), **Ex. 48**. Markowitz notes that these studies “show a sharp rise in mesothelioma risk with increasing asbestos exposure. This pattern signifies that at any level of occupational asbestos exposure, adding additional occupational exposure to asbestos increases the likelihood of developing malignant mesothelioma.” *Id.* Further, Markowitz identifies three consequences of the observed exposure-response pattern documented in the epidemiological literature:

First, for the individual who has had some occupational asbestos exposure, it is essential to avoid additional exposure to asbestos, because it adds, often dramatically, to their risk of developing malignant mesothelioma. Second, in terms of attribution of malignant mesothelioma to prior asbestos exposure, it is clear that each increment in occupational asbestos exposure contributes significantly to the development of mesothelioma in the group. For example, as shown in Table 1, in the two French and the German case-control studies [Iwatsubo, Rodelsperger, and Lacourt], adding up to 1 fiber/mL-year of exposure to the lowest category of asbestos exposure elevates the exposed persons to the next higher category of asbestos exposure and doubles or triples the risk of malignant mesothelioma. Third, finding excess cancer risk at low levels of occupational exposure to asbestos supports the notion that there is no safe level of exposure to asbestos.

Id. at 336-37 (footnotes omitted).

Numerous studies have also found that relatively low exposures chrysotile asbestos fibers cause mesothelioma. In 1996, Drs. Smith and Wright concluded that “[c]hrysotile asbestos is a potent cause of pleural mesothelioma.” **Ex. 49**, Smith and Wright, *Chrysotile Asbestos Is the Main Cause of Pleural Mesothelioma*, AM J IND MED 30:252-266, 255 (1996). The authors found that exposure to chrysotile asbestos “even at the relatively low levels expected in household exposures, can cause malignant mesothelioma.” *Id.*

In 2011, a survey of the literature found at least thirty “studies and cases from all over the world, where the overwhelming evidence is that chrysotile asbestos was the primary or only asbestos exposure.” **Ex. 50**, Kanarek, *Mesothelioma from Chrysotile Asbestos: Update*, ANN EPIDEMIOL 21:688-697, 695 (2011). The authors concluded that “[t]here are many well-documented cases of mesothelioma from chrysotile asbestos in case-reports and epidemiology studies from all over the world.” *Id.* at 695.

A study of Lithuanians exposed to uncontaminated chrysotile asbestos from Russia found that three out of four patients with mesothelioma had cumulative exposures less than 0.01 fiber years. **Ex. 51**, R.P. Everatt et al., *Occupational Asbestos Exposure Among Respiratory Cancer Patients in Lithuania*, Am. J. Indus. Med., Supplement 50:455-463 (2007).

Another recent study showing excess mesothelioma risk from chrysotile only exposure is an Egyptian study, M.T. Madkour, *Environmental exposure to asbestos and the exposure-response relationship with mesothelioma*, E. Mediterranean Health J. 15(1):25-38 (2009), **Ex. 52**. The authors found that those with environmental or occupational exposure to chrysotile asbestos had a 26 times greater risk of developing mesothelioma than those who were not exposed. *Id.* at 32. Mesothelioma was even more prevalent in the environmentally exposed group, with the overall

mean asbestos fiber concentration in the air outside the asbestos plant measured at 0.38 fibers per milliliter (mL). *Id.* at 30, 33. Half of the mesotheliomas (45 out of 90) were among those exposed to less than 7 fiber years. *Id.* at 36, Table 10.

The importance of each significant exposure is highlighted by the inverse relationship between the amount of asbestos inhaled and the time period in which a mesothelioma will develop if it is going to develop. The lower the dose, the longer the latency period. *See e.g., Ex. 53, Bianchi, Latency periods in asbestos-related mesothelioma of the pleura, EUR J CANCER PREV 6:162-166 (1997).*

In summary, abundant scientific literature provides a reliable scientific basis for the causation opinions of Plaintiffs' experts. Because their opinions are founded in sound science, Defendants' motion in limine should be denied.

B. Plaintiffs' experts' conclusions are widely accepted in the scientific community.

As referenced above, Dr. Laura Welch and 51 other scientists, researchers and medical professionals representing "hundreds of years of experience researching, diagnosing, and treating asbestos-related disease in workers and their families" as well publishing extensively in the field of asbestos and conducting dozens of epidemiologic and other studies into the issue of asbestos and disease, published a paper outlining the consensus of the mainstream scientific community regarding asbestos and its ability to cause disease. **Ex. 42, Welch.**

Plaintiffs' experts' causation opinions are entirely consistent with the consensus opinion Dr. Welch and her colleagues offer on asbestos and mesothelioma causation. Under the heading, "The Scientific Community is in Consensus that Even Brief and Low-level Exposure to Asbestos Can Cause Mesothelioma," these fifty-two independent experts explained:

The mainstream scientific community has long recognized and continues to recognize today that there is no “safe” level of exposure to asbestos. As noted by NIOSH:

Excessive cancer risks have been demonstrated at all fiber concentrations studied to date. Evaluation of all available human data provides no evidence for a threshold of for a “safe” level of asbestos exposure.

Attempts to postulate thresholds for exposure have been dismissed as “logical nonsense.”

Id. (emphasis added). Dr. Welch and her colleagues summarized some of the key studies that prove this view. *See id.* One of those, the 1998 Iwatsubo article noted above, showed “substantial excess mortality” at exposure levels below current regulatory levels. *See id.* Another study found that “all levels of probability and intensity [of exposure to asbestos] had an increased significant risk, except subjects with low probability of exposure.” *Id.* at 319. The scientists accordingly explained that “the consensus of the scientific community is that any occupational or para-occupational exposure to asbestos - even “brief or low-level exposures” - must be considered causal in an individual with a mesothelioma.” *Id.* at 321.

As scientists who have devoted substantial portions of our professional lives working to research, prevent, and treat asbestos-related diseases, we reject these attempts to fabricate uncertainty where none exists. Instead, we request that these courts attend to the work of thousands of experts from around the world who have concluded that asbestos, in any form, and through any occupational exposure, can and does cause disease.

Id. at 323.

C. Plaintiffs’ experts’ causation conclusions have been widely accepted by courts across the country.

In both *Jolly* and *Edwards*, *supra*, the South Carolina Court of Appeals rejected Defendants’ arguments that Plaintiffs’ experts’ cumulative dose opinions were unreliable or otherwise failed to meet South Carolina’s causation standard for asbestos cases. In both cases, the

Court of Appeals found these experts' opinions were properly admitted, with the *Jolly* Court stating, "the cumulative dose theory on which Respondents' experts relied easily meets the standard for reliability . . ." *Jolly* at 639, 869 S.E.2d at 836.

The federal asbestos MDL also repeatedly ruled that the opinion that every exposure to asbestos above background levels contributes to cause mesothelioma satisfies *Daubert*. Contrary to Defendants' argument, Judge Robreno of the federal asbestos MDL has found that a "cumulative exposure" opinion is not the same as the "each and every exposure" opinion. The court agreed with the plaintiff that the "cumulative exposure" opinion is different "in substance and by definition" from the "any exposure" opinion. *Mortimer v. A.O. Smith Corp.*, 2015 WL 12533103, at *8 (E.D. Pa. Oct. 23, 2015). The court therefore rejected the defendant's argument that the experts' opinions were inadmissible on grounds that they are the same as the "any exposure" opinion. *Id.* See also, *Rabovsky v. Air & Liquid Sys. Corp.*, No. 10-cv-03202, 2012 WL 252919 (E.D. Penn. Jan. 25, 2012), *affirmed by* 2012 WL 876752 (E.D. Penn. Mar. 13, 2012); *Schumacker v. Amtico*, No. 5:10-1627, 2010 U.S. Dist. LEXIS 144831 (E.D. Pa. Nov. 2, 2010); *Larson v. Bondex Int'l*, No. 09-69123, 2010 WL 4676563 (E.D. Penn. Nov. 15, 2010).

In *Schumacker*, the court found that the plaintiff's expert had used a reliable methodology in reaching this opinion. He relied on a variety of peer-reviewed studies, including the Consensus Report, and considered the amount of fibers released from working with the products at issue. *Id.* at *5-*6. The court noted that there is a significant body of published literature regarding what level of asbestos exposure can cause mesothelioma and that there is a legitimate debate within the scientific community regarding what that threshold level is (and indeed, whether a numeric threshold is even ascertainable). *Id.* at *7. Although the plaintiff's expert took one position in that debate and the defendant's expert took the opposite position, that does not make the plaintiff's

expert's opinion unreliable or inadmissible. *Id.* at *7-*8. Rather, the defendant's criticisms of the opinions were simply "fodder for cross-examination, and do not preclude the admissibility of [the] opinion." *Id.* at *7; *see also Rabovsky*, 2012 WL 252919, at *4; *Rabovsky*, 2012 WL 876752, at *4.

Recently, the Eleventh Circuit upheld the same opinions expressed by Plaintiffs' experts in this case. In *Bobo v. Tennessee Valley Auth.*, 855 F.3d 1294 (11th Cir. Apr. 26, 2017), the court noted that expert testimony that "there is no evidence that there is a threshold level of exposure below which there is zero risk of mesothelioma," and that "all 'significant' exposures to asbestos 'contribute to cause mesothelioma,'" is not the same thing as saying that each and every exposure is causative. *Id.* The expert's causation opinion was admissible because it was based on the exposure facts in the case and was supported by scientific literature, including the Helsinki Criteria. *Id.*

This case law generally reflects the general acceptance of the medical fact that asbestos diseases are cumulative dose diseases with documented exposures above background levels constituting a substantial contributing cause. As far back as 1973, the Fifth Circuit Court of Appeals observed that it has been "established that the effect of exposure to asbestos dust is cumulative, that is, each exposure may result in an additional and separate injury." *Borel v. Fibreboard Paper Products*, 493 F.2d 1076, 1094 (5th Cir. 1973). Many cases from many other jurisdictions are in accord and have admitted expert testimony to this effect. *See Osterhout v. Crane Co.*, 2016 U.S. Dist. LEXIS 35724, at *57-70 (N.D.N.Y. Mar. 21, 2016); *Davis v. Honeywell Int'l Inc.*, 245 Cal. App. 4th 477, 487, 199 Cal. Rptr. 3d 583, 591 (2016), *review denied* (May 25, 2016); *Walashek v. Air Liquid Sys. Corp.*, No. 14CV1567 BTM(BGS), 2016 WL 614030, at *7 (S.D. Cal. Feb. 16, 2016); *Relyea v. Borg Warner Corp.*, 2015 U.S. Dist. LEXIS 126895

(S.D.N.Y. Sept. 22, 2015); *Kochera v. GE*, 2015 U.S. Dist. LEXIS 125726, at *11 (S.D. Ill. Sept. 21, 2015); *Utech v. Asbestos Corp. Ltd.*, No. CV-14-4977-R (C.D. Cal. July 20, 2015); **Ex. 2**, *Garvin v. Agco Corp.*, No. 2012-CP-40-6675 (S.C. Ct. Comm. Pleas Nov. 14, 2014), at 21-25; *Quirin v. Lorillard Tobacco Co.*, 2014 U.S. Dist. LEXIS 26218, at *9-*10 (N.D. Ill. Feb. 28, 2014); *Lipson v. ON Marine Servs. Co., LLC*, 2013 U.S. Dist. LEXIS 175317, at *10 (W.D. Wash. Dec. 13, 2013); *John Crane, Inc., v. Linkus*, 988 A.2d 511, 523-24 (Md. App. 2010); *Jones v. John Crane, Inc.*, 35 Cal. Rptr. 3d 144, 151 (Cal. App. 2005); *AC & S, Inc. v. Abate*, 710 A.2d 944, 988 (Md. App. 1998), *abrogated on other grounds*; *John Crane, Inc. v. Wommack*, 489 S.E.2d 527, 541 (Ga. Ct. App. 1997); *Mavroudis v. Pittsburgh-Corning Corp.*, 935 P.2d 684, 689 (Wash. 1997); *Kurak v. A.P. Green Refractories Co.*, 689 A.2d 757, 761 (N.J. Super. App. Div. 1997).

D. Defendants' Arguments Are Without Merit

Despite the fact that Plaintiffs' experts' opinions are consistent with the consensus view on the causation of asbestos-related disease, and the type of causation opinions they have expressed have repeatedly been recognized as reliable and admissible expert testimony, Defendants have offered critiques based on a few cases that have excluded or criticized similar causation testimony. The thrust of Defendants' argument appears to be that expert opinions that are conclusive proof of causation in and of themselves must be excluded.

The asbestos MDL rejected this argument in the *Rabovsky* case, finding the admissibility of the expert's opinion is not really related to the sufficiency of the evidence question. 2012 WL 876752, at *4. The Court correctly recognized asbestos plaintiffs can rely on multiple types of evidence to meet their causation burden, with expert opinion being only one part of the case.

The District of Columbia circuit court has recognized this same principle, holding an expert's opinion "does not warrant exclusion simply because it fails to establish the causal link to

a specified degree of probability.” *Ambrosini v. LaBarraque*, 101 F.3d 129, 135 (D.C. Cir. 1996). Rather, “[t]he dispositive question is whether the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue, not whether the testimony satisfies the plaintiff’s burden on the ultimate issue at trial.” *Id.*

This Court should also reject the argument that Plaintiffs’ expert testimony will not be helpful to the jury because it is insufficient to meet the substantial factor causation standard. Defendants ignore that asbestos plaintiffs can rely on multiple types of evidence to meet their burden of proving causation, with their expert’s opinion being only one part of their case. The Pennsylvania Supreme Court upheld the admissibility of the plaintiff’s expert causation opinions, finding them compatible with the substantial factor causation standard:

We must agree with the Rosts that Ford has confused or conflated the “irrefutable scientific fact” that every exposure cumulatively contributes to the total dose (which in turn increases the likelihood of disease), with the legal question under Pennsylvania law as to whether particular exposures to asbestos are “substantial factors” in causing the disease. It was certainly not this Court’s intention, in either Gregg or Betz, to preclude expert witnesses from informing juries about certain fundamental scientific facts necessary to a clear understanding of the causation process for mesothelioma, even if those facts do not themselves establish legal (substantial factor) causation.

Rost, 151 A.3d at 1045-46 (Pa. 2016); *see also Jack*, 2018 WL 3819027, at *16.

Defendants often cite the opinions in *Butler v. Union Carbide Corp.*, 712 S.E.2d 537 (Ga. Ct. App. 2011) and *Yates v. Ford Motor Company*, 113 F.Supp.3d (E.D.N.C.) which faulted the plaintiff’s expert’s testimony because the court thought that there had not been adequate testing to establish a threshold exposure level for mesothelioma. *Yates* and other cases cited by Defendants confuse the reality that there is no known safe level of asbestos exposure with legal substantial factor causation standard.

The fallacy with this reasoning was highlighted by the Seventh Circuit, *Schultz v. Akzo Nobel Paints, LLC*, 721 F.3d 426 (7th Cir. 2013). In this benzene exposure case, the defendant attacked the plaintiff's expert's opinion because he stated that there was no known threshold below which benzene exposure does not cause acute myeloid leukemia ("AML") but had also identified the exposure level at which studies had found an elevated risk of AML. *Id.* at 432. The court explained that there is no inconsistency in these two positions: "The first says, in essence, that scientific studies confirm the danger of exposure to more than 10 ppm-years of benzene. The second says that no one is sure whether 10 ppm-years is the floor for risk, or 5 ppm-years, or 1 ppm-year, or nothing." *Id.* The Seventh Circuit disagreed with the trial court's conclusion that the expert had found the amount of exposure to be "irrelevant," given that the expert's "unambiguous conclusion that [the plaintiff] had been exposed to a level of benzene that has been shown in studies to be a 'very toxic and dangerous level.'" *Id.*

A number of courts have determined that the lack of a precise safe threshold for mesothelioma risk does not make the expert's opinion unreliable. In *Walashek*, for example, the court held "a causation expert's inability to identify a precise threshold for safe exposure goes to weight not admissibility of the expert's testimony." 2016 WL 614030, at *7; *see also Lipson*, 2013 WL 6536923, at *4 (same).

In evaluating the relevance of Plaintiffs' experts' causation testimony, this evidence must be considered in the context of the record as a whole. Their testimony undoubtedly has the tendency to make the causation facts more probable. They offer expertise regarding the manner in which asbestos exposure causes disease and the levels of exposure found sufficient in the literature to cause mesothelioma. At trial, they intend to evaluate Plaintiffs' exposures under defined criteria derived from the Consensus Report. Combined with the record evidence of

frequent, regular, and proximate exposure to asbestos, the causation opinions of Plaintiffs' experts are relevant and will aid the jury.

IV. CONCLUSION

Contrary to Defendants' contentions, the opinions of Plaintiffs' experts have a reliable foundation in the factual and scientific evidence. As the Court found in *Jolly* and *Garvin*, these opinions are reliable, helpful to the trier of fact, and would support a jury finding that exposure to Defendants' asbestos products or asbestos-containing products distributed and/or installed by Defendants caused Mr. Perry's mesothelioma. Plaintiffs therefore respectfully requests that the Court deny Defendants' motions to exclude or limit the causation testimony of Plaintiffs' experts.

Respectfully submitted,

/s/ Charles W. Branham

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ATTORNEYS FOR PLAINTIFF

July 24, 2024

Dallas, TX

EXHIBIT 1

STATE OF SOUTH CAROLINA
COUNTY OF SPARTANBURG
IN THE COURT OF COMMON PLEAS

FORM 4

JUDGMENT IN A CIVIL CASE

CASE NO. 2016-CP-42-1592

Beverly Dale Jolly and

General Electric Company, et al.

Brenda Rice Jolly

PLAINTIFF(S)

DEFENDANT(S)

Submitted by: Theile B. McVey

Attorney for : ☒ Plaintiff ☐ Defendant
or
☐ Self-Represented Litigant

DISPOSITION TYPE (CHECK ONE)

- ☐ **JURY VERDICT.** This action came before the court for a trial by jury. The issues have been tried and a verdict rendered.
- ☒ **DECISION BY THE COURT.** This action came to trial or hearing before the court. The issues have been tried or heard and a decision rendered. ☒ See Page 2 for additional information.
- ☐ **ACTION DISMISSED (CHECK REASON):** ☐ Rule 12(b), SCRPC; ☐ Rule 41(a), SCRPC (Vol. Nonsuit); ☐ Rule 43(k), SCRPC (Settled); ☐ Other
- ☐ **ACTION STRICKEN (CHECK REASON):** ☐ Rule 40(j), SCRPC; ☐ Bankruptcy; ☐ Binding arbitration, subject to right to restore to confirm, vacate or modify arbitration award; ☐ Other
- ☐ **STAYED DUE TO BANKRUPTCY**
- ☐ **DISPOSITION OF APPEAL TO THE CIRCUIT COURT (CHECK APPLICABLE BOX):**
☐ Affirmed; ☐ Reversed; ☐ Remanded; ☐ Other

NOTE: ATTORNEYS ARE RESPONSIBLE FOR NOTIFYING LOWER COURT, TRIBUNAL, OR ADMINISTRATIVE AGENCY OF THE CIRCUIT COURT RULING IN THIS APPEAL.

IT IS ORDERED AND ADJUDGED: ☒ See attached order (formal order to follow) ☐ Statement of Judgment by the Court:

ORDER INFORMATION

This order ☒ ends ☐ does not end the case.

Additional Information for the Clerk :

INFORMATION FOR THE JUDGMENT INDEX

Complete this section below when the judgment affects title to real or personal property or if any amount should be enrolled. If there is no judgment information, indicate "N/A" in one of the boxes below.

Judgment in Favor of (List name(s) below)	Judgment Against (List name(s) below)	Judgment Amount To be Enrolled (List amount(s) below)
		\$
		\$
		\$

If applicable, describe the property, including tax map information and address, referenced in the order:

The judgment information above has been provided by the submitting party. Disputes concerning the amounts contained in this form may be addressed by way of motion pursuant to the SC Rules of Civil Procedure. Amounts to be computed such as interest or additional taxable costs not available at the time the form and final order are submitted to the judge may be provided to the clerk. Note: Title abstractors and researchers should refer to the official court order for judgment details.

E-Filing Note: In E-Filing counties, the Court will electronically sign this form using a separate electronic signature page.

Circuit Court Judge
SCRPC Form 4C (02/2017)

2758
Judge Code

12-15-17
Date

Page 1 of 4

RoA_05759

FILED ELECTRONICALLY FILED - 2024 Jul 24 1:43 PM - RICHLAND - COMMON PLEAS - CASE#2023CP4004072

For Clerk of Court Office Use Only

This judgment was entered on the _____ day of _____, 20____ and a copy mailed first class or placed in the appropriate attorney's box on this _____ day of _____, 20____ to attorneys of record or to parties (when appearing pro se) as follows:

ATTORNEY(S) FOR THE PLAINTIFF(S)

ATTORNEY(S) FOR THE DEFENDANT(S)

CLERK OF COURT

Court Reporter:

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ADDITIONAL INFORMATION REGARDING DECISION BY THE COURT AS REFERENCED ON PAGE 1.

This action came to trial or hearing before the court. The issues have been tried or heard and a decision rendered.

Defendants' post-trial Motions are **DENIED**.

Plaintiffs' post-trial Motions are **GRANTED**.

and/or asbestos packing on valves, particularly during outages at the plant, and he recalled that the use of grinders and brushes created dust. (TT 7/25 at 74-76, 84-94). He recalled that there were a lot of Fisher and Crosby valves present at those plants. (TT 7/25 at 72-73, 90-91). At times, engineers from Fisher or Crosby were present to assist with the maintenance of the valves. (TT 7/25 at 107).

Exposure testimony was also provided by Mr. Jolly's co-worker, David Taylor, who worked at the same Duke nuclear plants where Mr. Jolly was stationed, particularly Oconee. (TT 7/25 at 198-201). As a pipefitter, it was Mr. Taylor's job to connect and disconnect valves and pumps to and from pipe systems. ((TT 7/25 at 201). He explained that he bolted valves to pipe flanges, and that there was a gasket between the pipe and the valve to seal the connection. (TT 7/25 at 201). He had to remove valve gaskets about once a week. (TT 7/25 at 204). He removed asbestos gaskets from valve flanges with a scraper or wire brush, which created a lot of dust. (TT 7/25 at 202, 204-05). Mr. Jolly was nearby when Mr. Taylor and other workers removed asbestos flange gaskets. (TT 7/25 at 207-09, 220).

Fisher and Crosby sold valves to Duke that were connected to the pipeline with a flange connection that utilized flange gaskets. (TT 7/25 at 74; TT 7/27 at 187-89; 7/31 at 122-23, 125, 164-65). Those flanged connections utilized asbestos gaskets. (TT 7/25 at 210). Fisher and Crosby valves also had internal asbestos gaskets and packing. (TT 7/25 at 210-13).

The original and replacement asbestos valve gaskets came from Fisher and Crosby. (TT 7/25 at 214-15; TT 7/26 at 214-15; TT 7/27 at 104-05). Most of the valve flange gaskets sold by Fisher and Crosby were asbestos gaskets. (TT 7/26 at 202, 210-13; Pl's Ex. 1012.6). Asbestos gaskets contain up to 90% asbestos. (TT 7/26 at 51-52).

The evidence at trial also established that at least some of the gaskets and packing sold by Defendants contained crocidolite, or Blue African asbestos. (Pl's Ex. 1008.10670; Pl's Ex. 1008.10665). Fisher also had a specification for crocidolite packing. (TT 7/27 at 201-02, 206; Pl's Ex. 2006.037). Defense expert Dr. Oury testified that gaskets and packing were known to contain crocidolite. (TT 8/2 at 188-89; Crosby Ex. 533). Crocidolite is known to be by far the most potent type of commercial asbestos fiber. (TT 8/1 at 114; TT 8/2 at 179).

There was testimony that Mr. Jolly's exposures to asbestos from Fisher and Crosby valves were many orders of magnitude above background levels. (TT 7/26 at 76-77). Dr. Frank testified that Mr. Jolly's exposures were extensive and repetitive. (TT 7/26 at 71).

Both of Plaintiffs' medical experts, Dr. Arthur Frank and Dr. John Maddox, testified that Mr. Jolly's exposure to asbestos from Fisher and Crosby valves was a substantial factor in the development of his mesothelioma. (TT 7/26 at 72-73; TT 7/31 at 180-82). They testified that mesothelioma can be caused by brief or low level cumulative exposures. (TT 7/26 at 41-43, 52-53; TT 7/31 at 179-80, 184-85). Even Defense expert Dr. Crapo admitted that a "very low" level of exposure to crocidolite can cause mesothelioma. (TT 8/1 at 114).

Experts on both sides agreed that Mr. Jolly's mesothelioma would most likely be fatal. (TT 7/26 at 99; TT 8/2 at 190). Dr. Frank testified that Mr. Jolly would likely die in a year or less. (TT 7/26, at 99-100). Mesothelioma was described as an unusually painful disease. (TT 7/26 at 98; TT 8/1 at 150-53). Dr. Frank and defense expert Dr. Crapo indicated that Mr. Jolly will continue to require medical care until his death. (TT 7/26 at 101-02; TT 8/1 at 153).

A jury trial was held against Fisher and Crosby in July and August 2017. The jury considered Plaintiffs' claims of negligence, strict products liability, and breach of implied warranty. They returned a verdict for Plaintiffs on the negligence and breach of implied warranty

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claims, and awarded \$200,000 in compensatory damages to Mr. Jolly and \$100,000 in compensatory damages to Mrs. Jolly.

II. Ruling on Motion for New Trial *Nisi Additur*.

A. Standard of Review

A new trial *nisi additur* may be granted when the trial court finds the amount of the verdict to be “merely inadequate” in light of the evidence presented at trial. *Green v. Fritz*, 356 S.C. 566, 570, 590 S.E.2d 39, 41 (2003); *Vinson v. Hartley*, 324 S.C. 389, 406, 477 S.E.2d 715, 723 (Ct. App. 1996). When granting a motion for *additur*, the court must offer compelling reasons. *Green*, 356 S.C. at 570, 590 S.E.2d at 41; *Bailey v. Peacock*, 318 S.C. 13, 14, 455 S.E.2d 690, 691 (1995). “Great deference is given to the trial judge . . . [because] the trial judge who heard the evidence and is more familiar with the evidentiary atmosphere at trial possesses a better-informed view of the damages than [the appellate courts].” *Waring v. Johnson*, 31 S.C. 248, 257, 533 S.E.2d 906, 911 (2000).

“A new trial *nisi* is one in which a new trial will be granted unless the party opposing it complies with a condition set by the court.” *Waring*, 31 S.C. at 257, 533 S.E.2d at 911. The trial court has the authority grant a new trial to the plaintiff unless the defendant agrees to the payment of an additional amount. *Id.* at 258, 533 S.E.2d at 911.

B. Additur

A new trial *nisi additur* is warranted when a jury has awarded medical damages for injuries caused by the defendant but has failed to consider the plaintiff’s pain and suffering associated with those injuries. *See Waring v. Johnson*, 31 S.C. 248, 260, 533 S.E.2d 906, 912 (2000). In *Waring*, the jury only awarded the exact amount of the plaintiff’s medical expenses, \$23,237.28, associated with her injuries from a car wreck. The Supreme Court found that it was proper to grant a *nisi*

additur of \$40,000 given the evidence that the plaintiff's pain was caused by her injury and that she was unable to continue her previously active lifestyle. *Id.* at 260, 533 S.E.2d at 912; *see also id.* at 258-59, 533 S.E.2d at 911-12 (collecting South Carolina cases upholding trial court orders granting new trial *nisi additur* under the abuse of discretion standard).

In *Riley v. Ford Motor Co.*, 414 S.C. 185, 188, 777 S.E.2d 824, 826 (2015), the Supreme Court held that the trial court had not abused its discretion in granting a *nisi additur* in the amount of \$600,000. This was a product liability case against Ford brought by the estate of a man who was killed when his door latch failed in a car accident. *Id.* at 189, 777 S.E.2d at 826-27. The uncontradicted evidence was that the family had \$228,000 in economic damages, plus a number of witnesses testified about the significant noneconomic damages suffered by his family. *Id.* at 193, 777 S.E.2d at 829. The trial court found the jury's verdict of \$300,000 to be inadequate, granted a *nisi additur* of \$600,000, and entered judgement for \$900,000. *Id.* at 189, 777 S.E.2d at

827.

In upholding the grant of a new trial *nisi additur*, the Supreme Court clarified that a *nisi additur* may be appropriate even when the jury has awarded some amount for noneconomic damages. *Id.* at 194, 777 S.E.2d at 829-30. The trial court had articulated compelling reasons for granting the *nisi additur*, including "a thorough recitation of the 'uncontested, and emotionally compelling' evidence, including testimony and supporting exhibits that demonstrated both the pecuniary losses suffered by the Riley family and also the noneconomic compensable elements of loss that are recoverable in a wrongful death action." *Id.*; *see also Graham v. Whitaker*, 282 S.C. 393, 405, 321 S.E.2d 40, 45 (1984) (upholding new trial *nisi additur* of several times the jury verdict, increasing actual damages from \$10,000 to \$67,500).

When considering a new trial *nisi*, it is proper to compare the jury's verdict to damages awards in comparable cases. *See Lucht v. Youngblood*, 266 S.C. 127, 136, 221 S.E.2d 854, 858 (1976); *see also Kapuschinsky v. U.S.*, 259 F. Supp. 1, 8 (D.S.C. 1966) ("Admittedly not controlling, but worthy of note are treatments of verdicts from all over this country").

Damages awards for pain and suffering in comparable mesothelioma cases range from \$1.5 million to more than \$20 million. *See, e.g., Keene v. CNA Holdings, LLC*, No. 2013-CP-42-03915 (S.C. Ct. Comm. Pleas Jan. 8, 2016) (upholding award of \$2 million in survival damages, \$5 million in loss of consortium damages, and \$5 million in wrongful death damages); *Garvin v. Agco Corp.*, No. 2012-CP-40-6675 (S.C. Ct Comm. Pleas Nov. 14, 2014) (remitting the jury verdict to award \$1.5 million for the plaintiff's pain and suffering and upholding the loss of consortium award of \$1 million); *see also Bobo v. Tennessee Valley Authority*, 855 F.3d 1294 (11th Cir. 2017) (affirming in relevant part the district court's award of \$3 million in pain and suffering damages for woman with asbestos-related mesothelioma); *Romano v. Metropolitan Life Ins. Co.*, --So.3d --, 2017 WL2265424 (La. Ct. App. 2017) (increasing pain and suffering award from \$500,000 to \$1.5 million in mesothelioma case where plaintiff had endured invasive surgery and was expected to die from his disease); *John Crane, Inc. v. Linkus*, 190 Md. App. 217, 988 A.2d 511 (Md. Ct. App. 2010) (upholding \$15,335,274 verdict for living shipyard worker diagnosed with mesothelioma at the age of 70, of which \$335,000 was medical expenses and \$15 million was noneconomic loss); *In re New York City Asbestos Litigation (Re D'Ulisse)*, 16 Misc.3d 945, 842 N.Y.S.2d 333 (N.Y. Sup. Ct. 2007) (denying motion to reduce award of \$20 million in past and future pain and suffering to mesothelioma victim and \$5 million to his wife of 51 years); *Williams v. CSX Transp., Inc.*, 176 N.C.App. 330, 626 S.E.2d 716 (N.C. Ct. App. 2006) (affirming verdict in which railroad worker with mesothelioma was awarded \$7.5 million in pain and suffering

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damages); *Goede v. Aerojet Gen. Corp.*, 143 S.W.3d 14, 17, 27-28 (Mo. Ct. App. 2004) (upholding award of \$2 million for pre-death pain, suffering and emotional distress where 43-year-old had survived one year with mesothelioma).

The South Carolina Supreme Court has held that the goal of compensatory damages is “to restore the injured party, as nearly as possible through the payment of money, to the same position he or she was in before the wrongful injury occurred.” *Clark v. Cantrell*, 339 S.C. 369, 378-379, 529 S.E.2d 528, 533 (2000).

Under this case law, it is clear that the Jollys’ verdict is inadequate and should be increased to more accurately reflect the extent of their losses. The jury only awarded Mr. Jolly medical expenses in the amount of \$142,000, plus \$58,000 for pain and suffering.

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The jury was instructed that, “[a]ctual damages are designed to compensate a party for their loss and to make that party as whole as near as money can do and to put him or her in the same position they were in before the accident or incident occurred. Actual damages would be the actual losses and expenses the Plaintiffs have incurred.” (TT 8/3 at 139). The jury was instructed on four categories of actual damages – medical expenses, pain and suffering, loss of enjoyment of life, and mental anguish. (TT 8/3 at 139-40). The jury was also instructed that future damages should be awarded for the duration of Mr. Jolly’s life expectancy, which is a little more than eleven (11) years given his age of 73. (TT 8/3 at 141-42).

The evidence supported damages in all of these categories, and for future damages. The jury’s award of only \$200,000 was not sufficient to make Mr. Jolly whole for the magnitude of his losses resulting from his mesothelioma diagnosis, treatment, and expected death.

Testimony bearing on damages was offered by Plaintiffs Dale and Brenda Jolly, their daughter, Tracy Pavlish, Plaintiffs’ expert Dr. Arthur Frank, and defense expert Dr. James Crapo.

As noted, Dr. Frank testified that all of the medical treatment received by Mr. Jolly was medically necessary. (TT 7/26 at 100). Dr. Frank testified, *without dispute*, that the total cost of Mr. Jolly's past and future medical care, from the time of his diagnosis to the time of his death, would reasonably be \$1,000,000. (TT 7/26 at 101, 179). This undisputed testimony took into account some of Mr. Jolly's past medical bills of \$142,000, plus the cost of his surgery that was hundreds of thousands of dollars. (TT 7/26 at 101, 193).

The jury heard evidence that Mr. Jolly is currently undergoing an experimental therapy that requires him to go for treatments and doctor visits several times a week. (TT 7/25 at 145, 162-63, 172; TT 7/26 at 100). Experts on both sides agreed that Mr. Jolly's would likely die from mesothelioma and that his medical needs would increase as he got sicker and closer to death. (TT 7/26 at 101-02; TT 8/1 at 153).

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Given this undisputed evidence of Mr. Jolly's past and future medical needs and expenses, the Court will increase the medical expenses award to \$1,000,000.

The Court also finds that the jury's award of \$58,000 for Mr. Jolly's pain and suffering in inadequate. There was evidence that after his diagnosis Mr. Jolly suffered greatly through three rounds of chemotherapy, and endured surgery that involved removing his rib and scraping out the tumor. (TT 7/25 at 145, 159-60, 175; TT 7/26 at 96-97, 102). He lost 45 pounds. (TT 7/25 at 60). His recovery from the surgery required months of rehabilitation to help him regain his ability to walk and to breathe without oxygen. (TT 7/25 at 161-62). At the time of trial, he was on an experimental treatment that he said "brings you to your knees." (TT 7/25 at 145). Dr. Frank and defense expert Dr. Crapo both confirmed that the pain associated with mesothelioma is quite bad. (TT 7/26 at 98; TT 8/1 at 150-53).

This is not to mention Mr. Jolly's expected death, which Dr. Crapo described at length as "in no way . . . a comfortable death [because it is] a very bad tumor," "not a very good death," and "a bad death." (TT 8/1 at 151, 152, 153). Mr. Jolly will continue to waste away and by the end of his life will likely require feeding by a feeding tube or intravenously, and will be on hospice care. (TT 7/26 at 102).

There was also substantial evidence of Mr. Jolly's loss of enjoyment of life. The evidence is that he was a very healthy, active person prior to his diagnosis and that because of his mesothelioma he can no longer do any of the things that bring him joy. (TT 7/25 at 157). The testimony was that his life "came to a halt" after his diagnosis. (TT 7/25 at 156-57). He was still working at Duke at the time of his diagnosis, at the age of 71, because he "loved" his work. (TT 7/25 at 64). He had to stop because of his illness. (TT 7/25 at 59). He used to keep a vegetable garden and spend a lot of time gardening and mowing the grass, which he can no longer do. (TT 7/25 at 165). He cannot go to church or have friends over for dinner. (TT 7/25 at 173). They used to go to the beach for a vacation every year and they can no longer do that. (TT 7/25 at 173).

Mr. Jolly has also suffered mental anguish. His daughter testified that he was "heartbroken" by the diagnosis, (TT 7/25 at 157), and became "depressed" after going through chemotherapy. (TT 7/25 at 159, 175). She explained that he was "devastated" by the recent news that his cancer had come back. (TT 7/25 at 162). Mr. Jolly's mental anguish was evident for the jury to witness, as he became overwhelmed with emotion. (TT 7/25 at 107-08).

The Court will increase Mr. Jolly's noneconomic damages award by a factor of ten, and award \$580,000.

The Court will also increase Mrs. Jolly's loss of consortium damages. The evidence established that Mr. and Mrs. Jolly have been married for 51 years. (TT 7/25 at 170). Mrs. Jolly

has turned into Mr. Jolly's caregiver and has witnessed him in a lot of pain. (TT 7/25 at 167, 173). Her own health has been neglected to the point that she had a heart attack a few weeks before trial. (TT 7/25 at 163-64). Her daughter described her as "really scared" by the return of the cancer. (TT 7/25 at 162).

Given everything that the Jollys have endured, and that her time with Mr. Jolly will be cut short by at least ten years, the jury's award of \$100,000 in loss of consortium damages is inadequate to compensate Mrs. Jolly for her losses. The evidence supports a loss of consortium award of \$290,000.

The Court therefore grants a new trial *nisi additur* and orders an added verdict of \$1,580,000 to Mr. Jolly and \$290,000 to Mrs. Jolly.

III. Ruling on Defendants' Joint Motion for Judgment Notwithstanding the Verdict

Fisher and Crosby have raised nine separate points of error in support of their motion for judgment notwithstanding the verdict. The Court denies Defendants' motion on all grounds.

A. Standard of Review

In ruling on a JNOV motion, the Court is required to view the evidence and the inferences that reasonably can be drawn therefrom in the light most favorable to the non-moving party. *Law v. S.C. Dept. of Corrections*, 368 S.C. 424, 434, 629 S.E.2d 642, 648 (2006); *Swicegood v. Lott*, 379 S.C. 346, 351, 665 S.E.2d 211, 213 (Ct. App. 2008); *Israel v. Carolina Bar-B-Que, Inc.*, 292 S.C. 282, 287, 356 S.E.2d 123, 127 (Ct. App. 1987). The court must deny the motion for JNOV when the evidence yields more than one inference or its inference is in doubt. *Id.*; *Steinke v. South Carolina Dep't of Labor, Licensing, & Regulation*, 336 S.C. 373, 386, 520 S.E.2d 142, 148 (1999). The jury's verdict may not be overturned if *any evidence* sustains the factual findings implicit in

its decision. *Welch v. Epstein*, 342 S.C. 279, 300, 536 S.W.2d 408, 419 (Ct. App. 2000); *Smalls v. South Carolina Dep't of Educ.*, 339 S.C. 208, 215, 528 S.E.2d 682, 686 (Ct. App. 2000).

B. Open and Obvious Danger.

Fisher and Crosby first contend that they had no duty to warn Jolly because the danger was open and obvious. This is contradicted by the fact that Fisher and Crosby took the position at trial that asbestos gaskets and packing are not dangerous. (TT 7/27 at 145-46). The jury could have concluded that neither Duke, nor Mr. Jolly, knew that the asbestos gaskets and packing used in Fisher and Crosby valves were dangerous because Fisher and Crosby completely denied that.

“‘A seller is not required to warn of dangers or potential dangers that are generally known and recognized.’” *Moore v. Barony House Rest., LLC*, 382 S.C. 35, 41–42, 674 S.E.2d 500, 504 (Ct. App. 2009) (quoting *Anderson v. Green Bull, Inc.*, 322 S.C. 268, 270, 471 S.E.2d 708, 710 (Ct. App. 1996)). The jury was instructed to this effect in this case. It was told that there is no duty to warn of a danger that is “obvious” or that is “generally known and recognized.” (TT 8/3 at 124).

In arguing that Mr. Jolly was aware of the danger, Defendants rely entirely on his testimony regarding warnings that Duke provided about asbestos insulation. (TT 7/25 at 119-20, 124-25, 130, 135). There was evidence that Duke did not know that asbestos gaskets were hazardous, and thus was not warning its employees. (Pl's Ex. 136). A Duke document from September 1984 instructing employees how to protect themselves from asbestos insulation, states that asbestos used in gasket material is "bonded, which means it produces virtually no dust." (Pl's Ex. 136 at Script, p. 3). Mr. Jolly explained that he was only warned by Duke about asbestos hazards that Duke knew about. (TT 7/25 at 142). Mr. Jolly's co-worker, David Taylor, testified that when Duke gave its employees information about asbestos hazards, Duke made a distinction between insulation and gaskets. (TT 7/27 at 126). Employees did not know there was a danger from asbestos gaskets until several years

after Duke started warning that precautions needed to be taken around asbestos insulation. (TT 7/27 at 127).

Fisher's representative, Ronald Duimstra, contended at trial that, with regard to asbestos components sold with Fisher valves and as replacement parts "there's no health risk and therefore there would be no reason to warn." (TT 7/27 at 146; *see also id.* at 148). Duimstra testified that there was no action for Duke to take with respect to warning about asbestos gaskets and packing. (TT 7/27 at 148-49, emphasis added). Crosby's representative, Robert Martin (TT 7/31 at 2, 4), similarly testified that "[w]e saw no danger from the gasket and the way we use them." (TT 7/31 at 33).

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Not only do Fisher and Crosby contend there was no health hazard from working with asbestos gaskets and packing, they did not always inform Duke that these materials contained asbestos. Some of Fisher's asbestos-containing packing specifications did not describe the material as containing asbestos, and instead referred to it as metallic or plastic. (TT 7/27 at 208-09). Mr. Duimstra agreed that a reference to a metal packing ring would not alert people that the product contained asbestos. (TT 7/27 at 210). Duke purchase orders to Fisher stated the Fisher part number and a brief description, but oftentimes in order to determine if the part contained asbestos one would have to reference Fisher's own material specification for that part number. (TT 7/27 at 215-16, 221-22, 225; Pl's Ex. 1012.5). Jolly's co-worker, David Taylor, testified that the only way to know if a gasket had asbestos was whether it was marked as asbestos-containing on the gasket packaging. (TT 7/27 at 115).

The Court finds that it is not possible to conclude, as a matter of law, that asbestos gaskets and packing were obviously dangerous to Mr. Jolly when Fisher and Crosby completely deny that they were dangerous at all and did not consistently notify Duke and its employees that valve

gaskets and packing were asbestos-containing. The question of whether Mr. Jolly knew about the danger of working around asbestos gaskets and packing was for the jury, which it decided in Plaintiffs' favor.

C. Sophisticated Intermediary Defense

The South Carolina Supreme Court has observed that the sophisticated intermediary defense has not been adopted in South Carolina. *See Lawing v. Univar, USA, Inc.*, 415 S.C. 209, 226, 781 S.E.2d 548, 557 (2015), *reh'g denied* (Feb. 12, 2016). The Court nevertheless determined that the jury should be instructed on this defense under the facts of this case. This is an affirmative defense for which Defendants had the burden of proof. *See Webb v. Special Elec. Co.*, 63 Cal. 4th 167, 187, 370 P.3d 1022, 1034 (2016).

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The jury decided this issue in Plaintiffs' favor. The Court finds that their verdict is supported by the evidence and that Fisher and Crosby are not entitled to judgment as a matter of law on this defense. Fisher and Crosby did not show that they warned Duke; the evidence was that Fisher and Crosby provided no warnings to Duke. (TT 7/27 at 144; TT 7/31 at 64-65). Fisher and Crosby also failed to show that they knew Duke was aware or should have been aware of the danger from asbestos gaskets. The evidence was that Duke distinguished asbestos gaskets as non-hazardous because it was thought they did not release asbestos fibers when disturbed. (Pl's Ex. 136 at Script, p. 3; TT 7/27 at 126). There was no evidence that Fisher and Crosby were relying on Duke to inform its employees of those hazards. The record thus supports the jury's rejection of this defense.

D. Product in Same Condition.

Fisher and Crosby contend that they are not liable for Mr. Jolly's exposure to asbestos flange gaskets because the flange gaskets "were placed between piping and the Defendants' valves

after they were sold and sent to Duke.” JNOV Motion at 10. Because the flange gaskets were applied to the flange during the installation of the valve at the power plant, Fisher and Crosby argue that the valve was not in the same condition as when they sold it.

The Court does not agree that connecting flanged valves to a pipeline in the field is an alteration of the valve. Fisher and Crosby sold valves that were connected to the pipeline with a flange connection that utilized flange gaskets. (TT 7/27 at 187-89; 7/31 at 18-19, 122-23, 125). The evidence was that Fisher and Crosby intended that flange gaskets would be used to connect their valves to the pipe line. (TT 7/27 at 188-89). Mr. Martin agreed that “the design was a flange that would have to have a gasket.” (TT 7/31 at 123).

Fisher and Crosby knew that asbestos flange gaskets would sometimes be used. (TT 7/31 at 122-23). Defendants’ engineers determined what materials the flange gaskets were made of to create the right seal under different conditions. (TT 7/27 at 189). Mr. Taylor recalled that the Fisher and Crosby valves present at Duke had flange connections that utilized asbestos flange gaskets. (TT 7/26 at 210-13).

Fisher and Crosby did not simply sell valves, they both also sold replacement asbestos flange gaskets to Duke. Mr. Taylor testified that all of the valve flange gaskets were supplied by the valve manufacturers. (TT 7/26 at 214-15; TT 7/27 at 104-05). Most of those valve flange gaskets were asbestos gaskets. (TT 7/26 at 202, 210-13). Duke purchase orders corroborate his recollection, as they show asbestos flange gaskets being sold by Fisher. (Pl’s Ex. 1012.6). The evidence supports a jury finding that Mr. Jolly was exposed to asbestos flange gaskets sold directly by Defendants.

To the extent that the use of a flange gasket on a flanged valve could be considered an “alteration” of the valve, it was an entirely foreseeable and expected modification. “Liability may

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be imposed on a manufacturer or seller notwithstanding subsequent alteration of the product when the alteration could have been anticipated by the manufacturer or seller.” *Small v. Pioneer Machinery, Inc.*, 329 S.C. 448, 466, 494 S.E.2d 835, 844 (Ct. App. 1997). Only “if it can be shown that the product was (1) materially altered before it reached the injured user and (2) such alteration could not have been expected by the manufacturer or seller, then the manufacturer or seller is not liable.” *Fleming v. Borden, Inc.*, 316 S.C. 452, 457, 450 S.E.2d 589, 592–93 (1994).

Fisher and Crosby did not show that the “alteration” of their valves by placing a flange gasket in the valve flange was unexpected. The valves could not be placed in service without use of a flange gasket, and, as noted, Fisher and Crosby sold asbestos flange gaskets to Duke. The jury declined to find an unexpected alteration to the valves simply from application of a flange gasket in the field that was called for by Defendants’ flanged valve design. Their determination is supported by the record.

E. Proximate Causation

Fisher and Crosby next contend that Plaintiffs did not show that Defendants’ failure to warn about the dangers of asbestos exposure from their valves was a proximate cause of Jolly’s mesothelioma. They contend that there is no evidence that Jolly would have heeded such a warning if it had been given. The Court disagrees.

Defendants rely on *Allen v. Long Mfg. NC, Inc.*, 332 S.C. 422, 505 S.E.2d 354 (Ct. App. 1998), which does state the basic rule that the failure to warn must be the proximate cause of the plaintiff’s injuries. *Allen* makes clear, however, that the issues of proximate cause, and the adequacy of the defendant’s warning, are for the jury to decide. *Id.* at 432-33, 505 S.E.2d at 360. In *Allen*, the product manufacturer did warn and the plaintiff did not follow the warning. But

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because there was evidence that the warning was inadequate, that created a fact issue as to whether a different warning would have caused the plaintiff to behave differently. *Id.*

Here, there was a fact issue for the jury. There was evidence that Mr. Jolly followed every asbestos warning he was given. He testified that when he saw asbestos warnings at Duke, he heeded them and avoided touching asbestos insulation. (TT 7/25 at 120). He did not go into areas that were cordoned off for asbestos abatement. (TT 7/25 at 125). When he was in a zone that required a respirator, he wore a respirator. (TT 7/25 at 121, 127). There was also evidence that Jolly checked for any applicable warnings on Fisher and Crosby products. (TT 7/25 at 142).

There was evidence that Fisher and Crosby did not warn about the hazards of asbestos on the asbestos-containing products they sold to Duke. (TT 7/25 at 209-10, 218-19; TT 7/27 at 143-44, 232; TT 7/31 at 64-65). Plaintiffs' expert, Dr. Frank, testified that product warning labels were required by OSHA as of 1972 and that Fisher and Crosby's products should have contained asbestos warnings. (TT 7/26 at 110-11, 189).

The record therefore supports the jury's conclusion that Mr. Jolly would have followed an adequate warning if one had been present on Fisher and Crosby products. Under *Allen*, the mere fact that an adequate warning was missing from the products was sufficient to create a jury question regarding whether an adequate warning would have changed Jolly's behavior. 332 S.C. at 432-33, 505 S.E.2d at 360. The evidence supports the jury's determination that Fisher and Crosby's failure to warn was a proximate cause of Jolly's mesothelioma.

F. Design Defect

Fisher and Crosby contend that Plaintiffs failed to prove their design defect claims because, they argue, there was no evidence of a reasonable alternative design. While a reasonable alternative design must be shown, this is part of the risk-utility test for design defect that is a matter for the

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jury to decide. *See Branham v. Ford Motor Co.*, 390 S.C. 203, 219, 701 S.E.2d 5, 13 (2010). The jury weighs the availability of a feasible alternative design, as well as the associated costs, safety, and functionality. *Id.* at 225, 701 S.E.2d at 16.

Evidence at trial showed that Fisher and Crosby had alternative feasible designs available to them at the time they were selling asbestos gaskets and packing with their valves and as replacement parts. Mr. Duimstra agreed that non-asbestos gasket and packing materials were always available. (TT 7/28 at 141). Mr. Martin also agreed that “one of the standards at that time would be asbestos but there are other materials they could have used.” (TT 7/31 at 122-23).

Mr. Duimstra and Mr. Martin both testified that there were a variety of non-asbestos gasket materials available, including graphite, metal, and Teflon. (TT 7/28 at 100; TT 7/31 at 125). Defendants both sold some valves to Duke that did not contain asbestos materials. (TT 7/31 at 139, 163).

With regard to packing, Mr. Duimstra testified that Teflon had been available since the 1950s, and could have been sold instead of asbestos packing. (TT 7/28 at 100-01, 140-41). He acknowledged that there was no reason for Mr. Jolly to be exposed to asbestos gaskets and packing because of the availability of alternative materials. (TT 7/28 at 145-46).

The record showed that there were multiple non-asbestos materials that were available to Fisher and Crosby and that they have could have sold gaskets and packing to Duke that were made exclusively out of graphite, metal, or Teflon. Defendants did, in fact, sell gaskets and packing to Duke that were made out of these alternative materials. The evidence created a fact issue for the jury on reasonable alternative design, and supports their finding in Plaintiffs’ favor on this issue.

G. Standard of Care

The evidence supports the jury's finding that Fisher and Crosby failed to meet the standard of care. There was evidence that they did not keep aware of the health hazards caused by the asbestos products they were selling, they failed to test their products to determine whether they were exempt from OSHA labeling regulations, they failed to comply with OSHA labeling requirements, and did not warn about asbestos hazards.

Plaintiff's expert Dr. Frank established that the dangers of asbestos exposure became known in industry around the turn of the century. (TT 7/26 at 86-89). In the early twentieth century, there were a number of publicly available publications about the dangers of asbestos exposure. (TT 7/26 at 88-89). In 1930, researchers Meriwether and Price published a paper that not only described the risk of lung diseases from asbestos exposure, but set forth the precautions that could be taken to reduce exposures and reduce the risk. (TT 7/26 at 86). Crosby received such information in the 1930s through its membership in the National Safety Council. (TT 7/31 at 91-92; Pl's Ex. 102).

By 1955, it was established that occupational asbestos exposure could cause lung cancer. (TT 7/26 at 89-90). By 1960, it was known that asbestos exposure could cause mesothelioma. (TT 7/26 at 91-93).

In the 1950s, the U.S. Department of Labor established workplace safety regulations for government contractors, called the Walsh-Healey Act, that required employers to take steps to control asbestos exposure levels below a certain threshold. (TT 7/26 at 83-85; Pl's Ex. 149.) As government contractors, Fisher and Crosby were required to comply with the Walsh-Healey Act. (TT 7/26 at 83-84; 7/31 at 85-86).

Although Fisher maintained a library at its manufacturing facility and corporate offices, it contained no publications regarding the hazards of asbestos. (TT 7/27 at 149). Crosby did not even

maintain a library of health and safety materials. (TT 7/31 at 71, 99). Nor did it have an industrial hygiene or a medical department. (TT 7/31 at 71). Mr. Martin admitted that he did not know of anything that Crosby had done to keep up with the dangers of the asbestos products it was selling. (TT 7/31 at 99).

Plaintiffs presented evidence that by 1980, when Mr. Jolly began working around asbestos gaskets and packing associated with Fisher and Crosby valves, Defendants should have known that the only safe level of asbestos exposure is zero. (TT 7/26 at 109). In Dr. Frank's opinion, Fisher and Crosby should have been warning users about the dangers of asbestos exposure from their valves. (TT 7/26 at 108-09, objections omitted).

In 1972, OSHA promulgated asbestos regulations, some of which applied to product manufacturers. (TT 7/26 at 81, 110-11; Pl's Ex. 155). As of that time, product manufacturers were required to place warning labels on any asbestos-containing products. (TT 7/26 at 81-82, 110-11). The OSHA asbestos regulations applied to Fisher and Crosby as sellers of asbestos-containing products. (TT 7/26 at 83).

The only exemption from OSHA's warning label requirement was if the manufacturer could demonstrate that the asbestos in the product was encapsulated and would not be released during the normal use of the product. (TT 7/26 at 111). In order to determine if a product releases asbestos dust during normal use, the manufacturer was required to conduct tests under normal working conditions to measure any fiber release from the product. (TT 7/26 at 112).

Fisher and Crosby claim that asbestos gaskets and packing were not friable. Dr. Frank testified, however, that asbestos fibers did not remain encapsulated during the ordinary wear and tear on the gaskets. (TT 7/26 at 109-10). There was also evidence that Fisher and Crosby did not measure the fiber release levels from the removal of asbestos gaskets and packing. (TT 7/27 at

146-47; TT 7/31 at 13, 33-34, 40-41, 90). In the absence of fiber release testing, the jury could have reasonably concluded that Defendants did not have a rational basis to say that their products did not release asbestos fibers. (TT 7/26 at 112).

There was evidence that replacement asbestos gaskets sold by Fisher and Crosby should have included an OSHA-approved asbestos warning label. (TT 7/26 at 189). In addition to a warning label, Fisher and Crosby could have provided material safety data sheets (“MSD sheet”) with information about the product composition, hazards, and recommended precautions. (TT 7/26 at 188-89). Dr. Frank testified that this was not an OSHA requirement until 1986, but would have been a good prudent business practice. (TT 7/26 at 194). If Fisher and Crosby had provided MSD sheets to Duke, that would have corrected Duke’s misconception, as stated in its asbestos policy, that gaskets do not release asbestos fibers. (TT 7/26 at 191-92).

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Even though Fisher was supposed to behave with the knowledge of an expert, Fisher did not discontinue its sales of asbestos-containing gaskets and packing until its customers demanded it. (Pl.’s Ex. 1008.01).

Defendants also argue that Mr. Jolly’s exposure to asbestos from their valves did not exceed OSHA permissible exposure limits (PEL). Plaintiffs’ evidence contradicted this, as Dr. Frank testified that “if you see dust from an asbestos product you’re dealing with levels that are generally quite high.” (TT 7/26 at 113). He further testified that Mr. Jolly’s exposures to asbestos from gaskets were many orders of magnitude above background levels. (TT 7/26 at 76-77).

Plaintiffs’ evidence therefore establishes the standard of care, and it was reasonable for the jury to conclude that Fisher and Crosby failed to meet this standard. Even though they were charged with the knowledge of experts, and were supposed to keep up with scientific developments with regard to the products they were selling, there was evidence that they made no effort to do

so. Even though they were required under OSHA to determine whether their products released asbestos fibers, there was evidence that they made no effort to do so. Even though they were required by OSHA to include a warning label on their asbestos products, the evidence showed that they failed to do so. Plaintiffs presented evidence that if Fisher and Crosby had tested their products, they would have learned that the gaskets and packing they were selling were friable, released high levels of asbestos, and should have included a caution label. The evidence was thus sufficient for the jury to conclude that Fisher and Crosby violated the standard of care.

H. Bare Metal Defense

1. Direct Sales to Duke

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Fisher and Crosby contend that they are entitled to summary judgment because they did not manufacture or provide the asbestos materials to which Mr. Jolly was exposed. This assertion is contradicted by the evidence that they were selling asbestos gaskets and packing to Duke with some of their valves, and that they also supplied replacement internal gaskets, flange gaskets, and packing. Under South Carolina law, “[a] manufacturer or assembler who incorporates a defective component part into its finished product and places the finished product into the stream of commerce is liable for injuries caused by a defect in the component part.” *Baughman v. General Motors Corp.*, 780 F.2d 1131, 1132 (4th Cir. 1986). In fact, “[a] manufacturer who incorporates into his product a component made by another has a responsibility to test and inspect such component, and his negligent failure to properly perform such duty renders him liable for injuries proximately caused as a consequence.” *Duncan*, 385 S.C. at 133, 682 S.E.2d at 884. “The fact that the manufacturer or assembler did not actually manufacture the component part is irrelevant, as it has a duty to test and inspect the component before incorporating it into its product.” *Baughman*, 780 F.2d at 1132.

There was evidence that Crosby valves have incorporated asbestos components since the 1930s. (TT 7/31 at 26). Internal asbestos gaskets were installed by Crosby at the factory. (TT 7/31 at 22). Some Crosby valves contained asbestos components until 1991, but thereafter asbestos replacement parts may still have been available. (TT 7/31 at 39). Crosby provided asbestos replacement gaskets. (TT 7/31 at 41).

Plaintiff presented evidence that Crosby sold a lot of valves to the Duke plants where Jolly worked—66 to Oconee, 72 to McGuire, and 18 to Catawba. (TT 7/31 at 143-150; Pl's Ex. 6395). Some Crosby valves sold to Duke contained asbestos gaskets. (TT 7/31 at 157). Crosby sold asbestos-containing replacement gaskets and packing to Duke. (TT 7/31 at 151, 155; Pl's Ex. 6364.04). The material specification for the gasket part card relevant to Duke sales showed that an asbestos gasket made by Garlock was supplied by Crosby. (TT 7/31 at 74-77; Pl's Ex. 6395, p. 39). This asbestos gasket was used in valve number 67261 at Duke. (TT 7/31 at 78). This gasket specification was for an asbestos-containing gasket until 1989. (TT 7/31 at 79). Other records show that asbestos gaskets were specified by Crosby until 1989. (TT 7/31 at 167).

Depending on Fisher's design, its valves came with a number of internal gaskets, including bonnet gaskets, cage gaskets, and seat ring gaskets, as well as packing. (TT 7/27 189-91). The gasket and packing material was selected according to Fisher specifications and installed at its manufacturing facility in Iowa. (TT 7/27 at 190, 208). Fisher sold valves to Duke that contained asbestos gaskets and packing. (TT 7/27 at 158). Fisher material specification 17A2 was for asbestos gasket material composed of 80 to 85% asbestos fiber. (TT 7/27 at 166-67). Fisher used a material specification number for its asbestos gaskets so that its customers could order replacement gaskets that were the exact same asbestos gaskets that had been supplied with the valve. (TT 7/27 at 167, 169). Every time the 17A2 specification was used in invoices and purchase

orders through 1988, the gaskets would have contained 85% asbestos. (TT 7/27 at 168). Fisher also had a specification number its customers could use to order asbestos packing from Fisher. (TT 7/27 at 177, 179, 192; Pl's Ex. 1008.1964; Pl's Ex. 948 at 27-28).

David Taylor testified that the replacement asbestos flange gaskets came from the valve manufacturers. (TT 7/26 at 214-15; TT 7/27 at 104-05). Purchase orders confirm the presence of Fisher valves at Duke and the sale of replacement asbestos gaskets, including asbestos flange gaskets, to Duke. (Pl's Ex. 1012; Pl's Ex. 1012.6; TT 7/26 at 215-16). Duke purchase orders indicate that Fisher was selling replacement asbestos gaskets, specification 17A2, to Duke facilities. (TT 7/27 at 168-69; Pl's Ex. 1008.1964). In 1982, Fisher sold replacement asbestos gaskets, specification 17A2, to the Oconee nuclear station. (TT 7/27 at 169; Pl's Ex. 1012.5). In 1982, Fisher sold several different asbestos gaskets to Oconee, including bonnet gaskets, gage gaskets, adaptor gaskets, and seat ring gaskets for Fisher valves. (Pl's Ex. 1012.5). Fisher sold more asbestos gaskets to Oconee in 1985. (Pl's Ex. 1012.7).

Given the evidence of sales of asbestos gaskets and packing from both Crosby and Fisher to Duke, the jury could have reasonably inferred that Mr. Jolly was exposed to asbestos materials supplied directly by Defendants. The record supports the conclusion that Mr. Jolly was exposed to asbestos gaskets supplied by Fisher and Crosby with their valves and as replacement parts.

2. Liability for Foreseeable Harm

Fisher and Crosby raise the so-called “bare metal” defense, contending that they do not bear liability for replacement asbestos gaskets and packing. The Court has already rejected this argument.

A manufacturer's duty to warn extends to foreseeable dangers resulting from the anticipated and intended use of its products. *See* Ralph King Anderson, Jr., South Carolina

Requests to Charge - Civil § 32-27 (2d ed. 2009); *Spruill v. Boyle-Midway, Inc.*, 308 F.2d 79, 84 (4th Cir. 1962); *Claytor v. General Motors Corp.*, 277 S.C. 259, 286 S.E.2d 129 (1982); *Carolina Home Builders, Inc. v. Armstrong Furnace Co.*, 259 S.C. 346, 359-60, 191 S.E.2d 774, 870 (S.C. 1972); *Mickle v. Blackmon*, 252 S.C. 202, 233, 166 S.E.2d 173, 187 (S.C. 1969). A manufacturer is “expected to anticipate the environment which is normal for the use of his product and . . . must anticipate the reasonably foreseeable risks of the use of his product in such environment.” *Mickle*, 252 S.C. at 233 (quoting *Spruill*, 308 F.2d at 83-84). “Liability may be imposed on a manufacturer or seller notwithstanding subsequent alteration of the product when the alteration could have been anticipated by the manufacturer or seller.” *Small v. Pioneer Machinery, Inc.*, 329 S.C. 448, 466, 494 S.E.2d 835, 844 (Ct. App. 1997).

In *Garvin*, Judge D. Garrison Hill ruled that when a “manufacturer recommends specifies, or requires that asbestos gaskets and packing be replaced with like materials,” liability may be imposed for replacement gaskets and packing because the product remains in essentially the same condition as when it was sold. *Garvin v. Agco Corp.*, No. 2012-CP-40-6675, at 18 (S.C. Ct. Comm. Pleas Nov. 14, 2014). Judge Hill reasoned that, “Crane’s liability arises because its own valves caused injury as manufactured, supplied, and designed by Crane with asbestos gaskets and packing. When the asbestos gaskets and packing were replaced with the same materials that came with the valve, it was not a ‘substantial change’ in the condition of the product.” *Id.* at 16-17.

The Court rejected the “bare metal defense” on the basis that Crane Co. valves were not sold as mere bare metal, but with asbestos materials that needed to be replaced. When asbestos replacement parts are recommended, specified, or required, the manufacturer cannot reasonably claim that its product somehow ceases to be harmful when such replacements are used. The Court reasoned that, “[t]o say Crane was no longer part of the ‘chain of distribution’ when the original

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gaskets and packing wore out on its still-functioning product would be artificial, if not silly.” *Id.* at 13-14. The evidence showed that the asbestos gaskets and packing used as replacements were no different than that originally supplied by Crane Co., that Crane Co. knew those parts would have to be replaced, and knew that exposure to asbestos was hazardous. *Id.* at 13. The Court determined that Crane Co. “occupied the best position in the chain of distribution to warn consumers of those risks.” *Id.* This conclusion is supported by the comments to the Restatement of Torts (Second) § 402A, incorporated by reference by S.C. Code Ann. § 15-73-30, which espouses the policy that “the consumer of such products is entitled to the maximum of protection . . . and the proper persons to afford it are those who market the products.” *See id.* at 14 (quoting Comment c to the Restatement of Torts (Second) § 402A).

Other courts have taken a similar approach and recognized an equipment manufacturer’s liability when the manufacturer could foresee and anticipate that asbestos replacement parts would be used and could cause injury. *See, e.g., Osterhout v. Crane Co.*, No. 514CV208MADDEP, 2016 WL 6310765, at *3 (N.D.N.Y. Oct. 27, 2016); *Stevens v. Foster Wheeler, LLC*, No. CV 14-157S, 2016 WL 8577465, at *3 (D.R.I. Oct. 14, 2016), *report and recommendation adopted sub nom. Stevens v. Air & Liquid Sys. Corp.*, No. CV 14-157 S, 2017 WL 1025797 (D.R.I. Mar. 16, 2017); *Spychalla v. Boeing Aero. Operations Inc.*, 2015 U.S. Dist. LEXIS 71682, at *8-11, 2015 WL 3504927 (E.D. Wis. June 3, 2015); *Quirin v. Lorillard Tobacco Co.*, 17 F. Supp. 3d 760, 762, 769-70 (N.D. Ill. 2014); *Chicano v. Gen. Elec. Co.*, 03-5126, 2004 WL 2250990 at *6 (E.D. Pa. Oct. 5, 2004); *In re New York City Asbestos Litig. (Dummit and Suttner)*, 27 N.Y.3d 765, 794, 59 N.E.3d 458 (N.Y. App. 2016); *McKenzie v. A. W. Chesterson Co.*, 373 P.3d 150, 159-60 (Or. App. 2016); *May v. Air & Liquid Sys. Corp.*, 129 A.3d 984, 1000 (Md. 2015).

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Most recently, the U.S. Third Circuit Court of Appeal reversed summary judgment for asbestos equipment manufacturers and held that under federal maritime law “a manufacturer of a bare-metal product may be held liable for a plaintiff’s injuries suffered from later-added asbestos-containing materials if the facts show the plaintiff’s injuries were a reasonably foreseeable result of the manufacturer’s failure to provide a reasonable and adequate warning” *In re Asbestos Prods. Liab. Litig. (Devries)*, 2017 WL 4366866, at *6 (3d Cir. Oct. 3, 2017). Such foreseeability is shown with evidence that the manufacturer knew asbestos was hazardous and knew asbestos-containing parts would be used with its equipment because the product was originally equipped with asbestos-containing parts, the manufacturer specified asbestos-containing parts, or the product required asbestos-containing parts to function properly. *Id.* at *6-7.

Here, Plaintiffs presented evidence that Fisher and Crosby sold their valves with asbestos components, knew that the gaskets and packing would have to be changed according to the valve design, and intended that asbestos replacements be used. There was evidence that Fisher engineers selected the components and built the valves for the particular application requested. (TT 7/27 at 197). Similarly, the internal components of Crosby valves were installed by Crosby pursuant to the valve design of Crosby engineers. (TT 7/31 at 22).

Both Fisher and Crosby had material specifications that called for asbestos gaskets and/or packing to be used. (TT 7/27 at 166-69; Pl’s Ex. 1008.1964; TT 7/28 at 84-86; TT 7/31 at 74-79, 167; Pl’s Ex. 6395, p. 39). Mr. Jolly recalled that the manuals for Fisher and Crosby valves specified the type of gaskets that must be used. (TT 7/25 at 78). Crosby, in fact, recommended that asbestos gaskets be used as replacement parts. (TT 7/31 at 30-31).

There was evidence that Fisher decided whether or not to utilize asbestos-containing materials for the parts it supplied with its valves and as replacement parts. (TT 7/27 at 225). In

1986, for example, it changed the material composition of its packing to substitute non-asbestos materials. (TT 7/27 at 226-27). After that substitution, Duke would order the same Fisher part number and receive a part with a different material. (TT 7/27 at 227-28).

In addition to specifying asbestos gaskets, Plaintiffs' evidence showed that Fisher recommended that the gasket should be replaced whenever the valve was opened. (TT 7/28 at 38-39). Crosby was similarly aware that the internal gaskets in its valves would have to be removed and replaced during routine maintenance of its valves. (TT 7/31 at 41).

Defendants also designed their valves with flanged connections, as set forth above. (TT 7/27 at 187-89; 7/31 at 18, 122-23, 125). A lot of the valves Fisher and Crosby sold to Duke had flanged connections. (TT 7/31 at 164-65). Because of that design, flange gaskets had to be used to connect their flanged valves to the pipeline. (TT 7/27 at 187-89; *see also* TT 7/31 at 18-19, 123). Fisher and Crosby knew that asbestos flange gaskets would sometimes be used. (TT 7/31 at 122-23). The Fisher and Crosby valves at Duke did, in fact, require asbestos flange gaskets. (TT 7/26 at 210-13).

The evidence that Fisher and Crosby could anticipate that asbestos components would be used in their valves, and that asbestos flange gaskets would be used with their flanged valves, raised questions of fact for the jury regarding Defendants' breach of their duty to warn of the foreseeable dangers resulting from the design of Defendants' valves. When Mr. Jolly or his co-workers used replacement asbestos gaskets and packing in Fisher and Crosby valves, the valves remained unchanged from Defendants' original design. The evidence was therefore sufficient for the jury to conclude that Fisher and Crosby were negligent in failing to warn Mr. Jolly of the asbestos hazards associated with their valves.

I. Expert Causation Testimony

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1. Standard of Review.

The admissibility of expert testimony is governed by South Carolina Rule of Evidence 702. That rule provides that “[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.” S.C. R. Evid. 702.

Courts evaluating the admissibility of scientific expert evidence “must find the evidence will assist the trier of fact, the expert witness is qualified, and the underlying science is reliable.” *State v. Council*, 335 S.C. 1, 20, 515 S.E.2d 508 (S.C. 1999). The reliability of scientific evidence is evaluated based on several factors, including: (1) the publications and peer review of the technique; (2) prior application of the method to the type of evidence involved in the case; (3) the quality control procedures used to ensure reliability; and (4) the consistency of the method with recognized scientific laws and procedures. *State v. White*, 382 S.C. 265, 274, 676 S.E.2d 684 (S.C. 2009) (citing *Council*, 335 S.C. at 19).

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“[C]ross-examination, presentation of contrary evidence, and careful instruction on the burden of proof” are the ordinary means to attack an opposing expert. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 596 (1993). Courts should not exercise their gatekeeping responsibility by excluding expert testimony that falls within the range of matters on which reasonable experts can disagree. *See Milward v. Acuity Specialty Prods. Group, Inc.*, 639 F.3d 11, 22 (1st Cir. 2011). While the trial court may look at the reliability of the expert’s methodology, it is for the jury to determine the soundness of the facts underlying the expert’s opinion and the correctness of the expert’s conclusions. *See id.* 22.

2. Testimony of Dr. Frank and Dr. Maddox

Dr. Frank and Dr. Maddox testified that mesothelioma can be caused by brief or low level cumulative exposures. (TT 7/26 at 41-43, 52-53; TT 7/31 at 179-80, 184-85). These experts were entitled to rely on this basic medical fact in reaching their opinion in this case. That does not mean that they concluded that “each and every exposure” that Mr. Jolly had was a substantial factor in causing his disease. This distinction was recently explained by the Pennsylvania Supreme Court in an opinion upholding the admissibility of Dr. Frank’s causation opinions. *See Rost v. Ford Motor Co.*, 151 A.3d 1032, 1045-46 (Pa. 2016). The court found his testimony to be entirely compatible with the substantial factor causation standard. *Rost v. Ford Motor Co.*, 151 A.3d 1032, 1045-46 (Pa. 2016).

The Eleventh Circuit has recently held the same. In *Bobo v. Tennessee Valley Auth.*, 855 F.3d 1294 (11th Cir. Apr. 26, 2017), the court noted that expert testimony that “there is no evidence that there is a threshold level of exposure below which there is zero risk of mesothelioma,” and that “all ‘significant’ exposures to asbestos ‘contribute to cause mesothelioma,’” is not the same thing as saying that each and every exposure is causative. *Id.* The expert’s causation opinion was admissible because it was based on the exposure facts in the case and was supported by scientific literature, including the Helsinki Criteria. *Id.*

Judge Robreno of the federal asbestos MDL has similarly found that a “cumulative exposure” opinion is not the same as the “each and every exposure” opinion. The court agreed with the plaintiff that the “cumulative exposure” opinion is different “in substance and by definition” from the “any exposure” opinion. *Mortimer v. A.O. Smith Corp.*, 2015 WL 12533103, at *8 (E.D. Pa. Oct. 23, 2015). The court therefore rejected the defendant’s argument that the experts’ opinions were inadmissible on grounds that they are the same as the “any exposure” opinion. *Id.*

As recognized by these other distinguished courts, which have all admitted the causation testimony of Dr. Frank and/or Dr. Maddox, it is not proper to evaluate the experts' medical opinions with reference to only one narrow part of the basis for the opinion. In reaching their opinions, Dr. Frank and Dr. Maddox both relied on their many years of experience in the area of asbestos-related diseases, as well as a broad range of evidence including epidemiology and other scientific literature, the dose-response relationship, the science regarding the low levels of exposure that can cause mesothelioma, the exposure levels documented from working with gaskets and packing in the manner described by Jolly and Taylor, and the facts surrounding Jolly's exposure to visible dust from Defendants' valves. (TT 7/26 at 19-95; 7/31 at 169-77, 179-80, 184-85).

The specific causation opinions of Drs. Frank and Maddox were firmly grounded in the exposure evidence presented at trial. Dr. Frank testified that he had reviewed Jolly's medical records, the deposition transcripts of Jolly and his co-workers and other case-specific materials. (TT 7/26 at 58-60). He also described that, based on Jolly's testimony, the exposures he had from working with Fisher and Crosby valves were quite high. (TT 7/26 at 51). Mr. Jolly's exposures were many orders of magnitude above background levels. (TT 7/26 at 76-77). In stating his causation opinion, Dr. Frank relied on a summary of the exposure facts proven to the jury. (TT 7/26 at 72-73).

Dr. Maddox similarly based his specific causation opinions on a summary of the exposure facts in this case. (TT 7/31 at 180-82). Dr. Maddox also addressed the issue of very low exposures and explained that low exposures carry only a low risk of disease. (TT 7/31 at 194-95).

The trial testimony of Dr. Frank and Dr. Maddox demonstrates that their causation opinions are based on the record of Mr. Jolly's repeated exposures to asbestos from Fisher and Crosby

valves during four years at Duke, as well as the scientific literature. The methodology and approach of Dr. Frank and Dr. Maddox is exactly the same as that approved by Judge Hill in *Garvin v. Agco Corp.*. There, Judge Hill rejected a challenge to the admissibility of Dr. Maddox's causation testimony, and found it reliable and helpful to the trier of fact. No. 2012-CP-40-6675 (S.C. Ct. Comm. Pleas Nov. 14, 2014).

The Court finds that the causation testimony of Dr. Frank and Dr. Maddox is admissible. It is supported by the scientific literature as well as the facts of this case, and was relevant and helpful to the jury.

J. *Henderson* Causation Standard

A plaintiff in an asbestos case may defeat summary judgment with evidence of "actionable exposure" to a defendant's asbestos product. *Henderson v. Allied Signal, Inc.*, 373 S.C. 179, 185, 644 S.E.2d 724, 727 (2007). To determine whether exposure is actionable, South Carolina courts apply the "frequency, regularity and proximity" factors set forth in *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156 (4th Cir. 1986). *Id.* Therefore, "[t]o support a reasonable inference of substantial causation from circumstantial evidence, there must be evidence of exposure to a specific product on a regular basis over some extended period of time in proximity to where the plaintiff actually worked." *Id.* (quoting *Lohrmann*, 782 F.2d at 1162).

The Court finds that the *Henderson* causation standard is satisfied by the evidence presented at trial. The evidence showed that when Mr. Jolly was a mechanical inspector at Duke from 1980 to 1984, he was repeatedly exposed to asbestos gaskets and packing from Fisher and Crosby valves. (TT 7/25 at 61-63, 72-76, 84-94). Asbestos gaskets and packing were removed in a manner that released dust, and Mr. Jolly was close enough to breathe that dust many times over the course of his time at Duke. (TT 7/25 at 198-201, 204-05, 220).

App. 1998). Consequently, there are no inconsistent remedies for Plaintiffs to choose between, no danger of double recovery as the jury only made one award per plaintiff. Plaintiffs do not have to elect their remedies in this matter.

V. Ruling on Defendants' Motion for Production of Settlements

Defendants argue that they are entitled to disclosure of Plaintiffs' confidential settlement documents because they are "relevant" to set-off. The Court does not find a compelling reason to require disclosure of the confidential releases. The only matter of relevance is the amount of the settlements, and that information has been disclosed. The Court has reviewed the releases *in camera* and has verified that Plaintiffs' pre-trial settlements are in the amount of \$2,270,000. Defendants' motion for production of settlement releases is denied.

VI. Ruling on Defendants' Motion for Setoff

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Defendants are entitled to a set-off in the amount of Plaintiffs' settlements with other defendants in this case. S.C. Code Ann. § 15-38-50 provides that, "[w]hen a release . . . is given in good faith to one of two or more persons liable in tort for the same injury or the same wrongful death: (1) . . . it reduces the claim against the others to the extent of any amount stipulated by the release or the covenant, or in the amount of the consideration paid for it, whichever is the greater" S.C. Code Ann. § 15-38-50.

Defendants correctly assert that Plaintiffs have received settlement money from other defendants in this case. The Court has verified that Plaintiffs have received \$2,270,000 in pre-trial settlements. This is not the end of the matter, however. In determining set-off, the Court must take into account the allocation of these pre-trial settlements to the various claims that the Jollys have or may have had at the time the settlement releases were executed.

In *Ellis v. Oliver*, 335 S.C. 106, 112-13, 515 S.E.2d 268, 271-72 (Ct. App. 1999), the Court of Appeals held that “when a prior settlement involves compensation for the same injury for which the jury awarded damages, the right to setoff arises as an operation of law.” *Smith v. Widener*, 397 S.C. 468, 473, 724 S.E.2d 188, 191 (Ct. App. 2012). However, when the settlement involves compensation for an injury different from the one tried to verdict, there is no setoff as a matter of law. *Hawkins v. Pathology Assocs. of Greenville, P.A.*, 330 S.C. 92, 114-15, 498 S.E.2d 395, 407 (Ct. App. 1998). When the settlement “is argued to involve two claims, one of which involves the same injury as the claim tried to verdict and one of which does not, the circuit court must make the factual determination of how to allocate the settlement between” the claims. *Smith*, 397 S.C. at 473, 724 S.E.2d at 191.

The claims tried to verdict in this matter were personal injury claims on Mr. Jolly’s behalf and loss of consortium on Mrs. Jolly’s behalf. The settlements received by Plaintiffs also include compensation for the release of the potential future wrongful death claim that the Jolllys had at the time of their pre-trial settlements. As such, Defendants’ entitlement to a setoff does not arise as a matter of law.

Defendants are only entitled to “credit for the amount paid by another defendant who settles for the same cause of action.” *Rutland v. S.C. Dep’t of Transp.*, 400 S.C. 209, 216, 734 S.E.2d 142, 145 (2012). Plaintiffs’ personal injury and loss of consortium claims are separate and distinct from their potential wrongful death claim. Because the potential wrongful death claim is different, factually and legally, from the claims tried to verdict, the amount that Plaintiffs received as compensation for the release of future claims, such as wrongful death, should not be considered by this Court when determining the setoff amount. Instead, in accordance with *Rutland* and *Smith*,

only the amounts received by Plaintiffs in settlement for the personal injury and loss of consortium claims should be considered when determining the setoff amount.

In determining the allocation of Plaintiffs' settlements, the Court accepts Plaintiffs' representation that at the time the settlements were received by Plaintiffs, they were internally allocated as one-third to Mr. Jolly's personal injury claims, one-third to Mrs. Jolly's loss of consortium claims, and one-third to the release of future wrongful death claims. Additionally, the Court reviewed the releases of the settling defendants and confirmed that all future claims related to Mr. Jolly's mesothelioma, including wrongful death, were released by the Plaintiffs. Because the total pre-trial settlements were in the amount of \$2,270,000, one-third of the settlements is valued at \$756,666.67.

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The Court finds that the internal allocation of the settlement funds received by Plaintiffs is reasonable as required by South Carolina precedent. The Supreme Court has noted that "[s]ettling parties are naturally going to allocate settlement proceeds in a manner that serves their best interests. That fact alone is insufficient to justify . . . reapportionment for the sole purpose of benefitting [non-settling defendants]." *Riley v. Ford Motor Co.*, 414 S.C. 185, 196-97, 777 S.E.2d 824, 830-31 (2015).

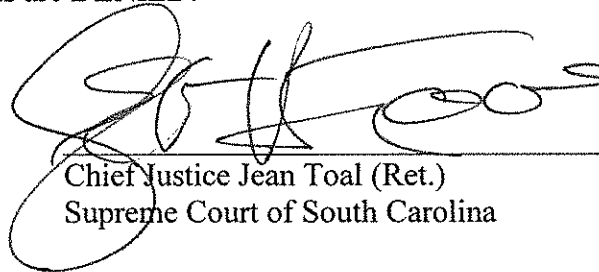
As set forth above, the total amount of the added verdict for Mr. Jolly's personal injury claims is \$1,580,000. Defendants are entitled to a setoff in the amount of Plaintiffs' pre-trial settlements allocated to the personal injury claim, which is \$756,666.67. Defendants owe the balance of \$823,333.33 for Mr. Jolly's personal injury claim.

As set forth above, the total amount of the added verdict for Mrs. Jolly's loss of consortium claim is \$290,000. This does not exceed the \$756,666.67 in settlement proceeds allocated to her loss of consortium claim.

VII. Conclusion

The Court GRANTS Plaintiffs' motion for new trial *nisi additur*, and raises the verdict to \$1,580,00 for Mr. Jolly's personal injury damages and \$290,000 for Mrs. Jolly's loss of consortium damages. The Court GRANTS in part Defendants' motion for set-off, and reduces Mr. Jolly's damages by one-third of Plaintiffs' pre-trial settlements, in the amount of \$756,666.67. Mrs. Jolly's damages are likewise reduced in the amount of \$756,666.67, which exceeds her added damages award. Judgment will therefore be entered against Defendants in the amount of \$823,333.33. Defendants may, of course, reject the additur, and a new trial will be scheduled. Defendants' remaining post-trial motions are DENIED.

IT IS SO ORDERED.



Chief Justice Jean Toal (Ret.)
Supreme Court of South Carolina

#37
December 15, 2017

EXHIBIT 2

JUDGMENT IN A CIVIL CASE

STATE OF SOUTH CAROLINA
COUNTY OF RICHLAND
IN THE COURT OF COMMON PLEAS

CASE NUMBER: 2017CP4008675

Lloyd Strom Garvin

BW/IP International Inc

Velda Garvin

Byron Jackson Pump Company

PLAINTIFF(S)

DEFENDANT(S)

Submitted by: _____

Attorney for : ☐ Plaintiff ☐ Defendant or ☐ Self-Represented Litigant

DISPOSITION TYPE (CHECK ONE)

- ☐ **JURY VERDICT.** This action came before the court for a trial by jury. The issues have been tried and a verdict rendered.
- ☐ **DECISION BY THE COURT.** This action came to trial or hearing before the court. The issues have been tried or heard and a decision rendered.
- ☐ **ACTION DISMISSED (CHECK REASON):** ☐ Rule 12(b), SCRPC; ☐ Rule 41(a), SCRPC (Vol. Nonsuit);
☐ Rule 43(k), SCRPC (Settled); ☐ Other _____
- ☐ **ACTION STRICKEN (CHECK REASON):** ☐ Rule 40(j), SCRPC; ☐ Bankruptcy;
☐ Binding arbitration, subject to right to restore to confirm, vacate or modify arbitration award; ☐ Other _____
- ☐ **DISPOSITION OF APPEAL TO THE CIRCUIT COURT (CHECK APPLICABLE BOX):**
☐ Affirmed; ☐ Reversed; ☐ Remanded; ☐ Other _____

NOTE: ATTORNEYS ARE RESPONSIBLE FOR NOTIFYING LOWER COURT, TRIBUNAL, OR ADMINISTRATIVE AGENCY OF THE CIRCUIT COURT OF THE RULING IN THIS APPEAL.

IT IS ORDERED AND ADJUDGED: ☒ See attached order (formal order to follow) ☐ Statement of Judgment by the Court:

ORDER INFORMATION

This order ☐ ends ☐ does not end the case.

Additional Information for the Clerk : _____

INFORMATION FOR THE JUDGMENT INDEX

Complete this section below when the judgment affects title to real or personal property or if any amount should be enrolled. If there is no judgment information, indicate "N/A" in one of the boxes below.

Judgment in Favor of (List name(s) below)	Judgment Against (List name(s) below)	Judgment Amount To be Enrolled
		\$
		\$
		\$

If applicable, describe the property, including tax map information and address, referenced in the order:

The judgment information above has been provided by the submitting party. Disputes concerning the amounts contained in this form may be addressed by way of motion pursuant to the SC Rules of Civil Procedure. Amounts to be computed such as interest or additional taxable costs not available at the time the form and final order are submitted to the judge may be provided to the clerk. **Note: Title abstractors and researchers should refer to the official court order for judgment details.**

Circuit Court Judge _____

Judge Code _____

Date _____

For Clerk of Court Office Use Only

This judgment was entered on the _____ day of _____, 20____ and a copy mailed first class or placed in the appropriate attorney's box on this 10th day of Dec., 20 14 to attorneys of record or to parties (when appearing pro se) as follows:

Theile Branham McVey

Mark H. Wall

Robert O. Meriwether

Timothy W. Bouch

ATTORNEY(S) FOR THE PLAINTIFF(S)

ATTORNEY(S) FOR THE DEFENDANT(S)

Court Reporter _____

Clerk of Court



STATE OF SOUTH CAROLINA

COUNTY OF RICHLAND

LLOYD STROM GARVIN, and
VELDA GARVIN,
Plaintiff,

v.

AGCO CORPORATION f/k/a ALLIS
CHALMERS COMPANY, et al.,
Defendants.

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IN THE COURT OF COMMON PLEAS

C/A No. 2012-CP-40-6675

2014 DEC 10 AM 11:08
JEANETTE W. MET
C.C.P. & G.S.

FILED
RICHLAND COUNTY

**ORDER DENYING IN PART AND GRANTING IN PART
DEFENDANT CRANE CO.'S MOTION FOR POST-TRIAL RELIEF**

In this asbestos case, Defendant Crane Co. ("Crane") moves for relief from the jury's September 11, 2013 verdict. For the reasons set forth below, Crane's motions for judgment notwithstanding the verdict and new trial absolute are DENIED, but Crane's motion for new trial nisi remittitur is GRANTED.

I. The Evidence at Trial

Viewing the record in the light most favorable to Plaintiffs, sufficient evidence supports the jury's finding that Plaintiff Lloyd Garvin suffers from malignant mesothelioma proximately caused by exposure to asbestos. Mr. Garvin and his wife, Velda, brought this action against companies that made asbestos products Mr. Garvin allegedly worked with during his career as a maintenance mechanic and millwright. Evidence at trial indicated that during his employment at the Graniteville textile plant from 1964 to 1972 and the Carolina Eastman plastics plant from 1974 to 2003, he was exposed to asbestos gaskets and packing while installing and repairing pumps and valves, including Crane valves.

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From 1964 to 1972 at Graniteville, Mr. Garvin installed and maintained new pumps and valves. The Graniteville site included many different buildings, and Mr. Garvin worked at all of the site's facilities.

After leaving Graniteville, Mr. Garvin worked at Carolina Eastman for about 30 years. He started as a millwright in the construction division and eventually became a millwright foreman and then a millwright general foreman. The site manager at Carolina Eastman, Doyle Ridgell, testified that there were seven or eight plants that each made a different product, and Mr. Garvin worked in all of them at various times. He worked on the construction of new buildings, installing new valves and pumps. He also did maintenance and repair work on valves and pumps. There was testimony that even after Mr. Garvin became a foreman in the 1970s, he was a "working foreman," who did hands on work on valves and pumps with his crew.

There was evidence that Mr. Garvin installed new Crane valves and repaired them at both Graniteville and Carolina Eastman. He first worked on Crane valves in 1964, and last worked around them in the 1990s. He recalled that Crane valves were "all over" Carolina Eastman. (Garvin Discovery Depo., at 115:2-8.) Documentary evidence, including Crane Co. specifications for various types of valves used at Carolina Eastman, confirmed that Crane's asbestos-containing valves were present at Carolina Eastman. Mr. Ridgell testified that Mr. Garvin worked on all the Crane valves at the plant, including rebuilding Crane valves.

Evidence showed Crane standardized the use of asbestos gaskets and packing on all of its bronze, iron and steel valves. Asbestos was the standard offering from Crane up into the 1980s. Crane's manuals and drawings from Carolina Eastman list asbestos gaskets and/or packing in the Crane valves present at that facility. The evidence showed that every Crane valve at Carolina

Eastman had asbestos-containing gaskets or packing. Mr. Garvin testified that he knew how to tell the difference between gaskets made of asbestos and gaskets made of other materials, and he identified the valve gaskets as asbestos. Plaintiffs' occupational medicine expert, Dr. Edwin Holstein, and defense expert Dr. Victor Roggli testified that Crane valves utilized asbestos gaskets and packing.

Mr. Garvin removed gaskets and packing from Crane valves. About 80% of the valves had flange gaskets. Crane valves also had an internal gasket on the top of the valve. It was part of Mr. Garvin's job as a mechanic to remove and replace asbestos gaskets on valves. He estimated that the gaskets stuck to the metal valve about 75% of the time. When the gaskets stuck, he had to scrape them off with a putty knife, scraper, hammer, wire brush, power wire brush, or end grinder. It took up to half an hour to scrape off a gasket, and it was a dusty process.

Mr. Garvin also removed and replaced asbestos packing on Crane valves. All new valves came with packing that had to be removed during maintenance work, using a special tool called a packing puller. The old packing came out in pieces. Sometimes Mr. Garvin had to use compressed air to blow out the old packing. Removing packing created visible dust, as did cleaning up the packing debris.

Crane supplied its valves with asbestos gaskets and packing, and there was evidence that Mr. Garvin performed maintenance on new Crane valves that he or others had installed. When Mr. Garvin started at Carolina Eastman in 1974, he was involved in constructing a seven-story building, called 17L01 or the polymer building, and all of his work as millwright on this construction involved installing new equipment. Mr. Ridgell testified that Mr. Garvin installed new pumps and valves in that building, and once construction was complete Mr. Garvin and

another millwright maintained and repaired the pumps and valves. Mr. Garvin did first maintenance on new valves that came with packing. He performed this work himself, and was also in close proximity to work on pumps and valves done by others.

Dr. Holstein testified regarding causation of Mr. Garvin's mesothelioma from his exposure to asbestos while working on Crane valves. Dr. Holstein testified that the gaskets and packing in Crane valves contained asbestos. This testimony was based on Crane's specifications for the plants where Mr. Garvin worked as well as historical evidence that asbestos gaskets were virtually always used in valves in industrial operations during the relevant time period.

Dr. Holstein testified that Mr. Garvin's exposure to asbestos gaskets and packing supplied directly by Crane was a substantial factor in causing his mesothelioma. Dr. John Maddox, a pathologist who specializes in asbestos-related disease, agreed that Mr. Garvin's exposure to asbestos from Crane valves was a substantial factor in causing his mesothelioma. Crane presented testimony from pathologist Dr. Victor Roggli, who testified Mr. Garvin had insufficient exposure to asbestos from Crane valves to cause his mesothelioma.

Mr. Garvin has an especially rare form of mesothelioma that originated in his testicles called mesothelioma of the tunica vaginalis testis, a subset of the more common peritoneal mesothelioma. There was evidence that Mr. Garvin's mesothelioma may be fatal, although there was also testimony that with mesotheliomas of this type there is a 50% chance of recovery. He was in remission at the time of trial.

A jury trial was held against Crane and two other defendants, Durco and Byron Jackson, in August and September 2013. The jury was charged the law of negligence, strict product liability, and breach of implied warranty. They returned a verdict of \$10 million in compensatory

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damages to Lloyd Garvin and \$1 million in compensatory damages for loss of consortium to Velda Garvin. After a bifurcated trial on punitive damages, the jury awarded \$11 million in punitive damages against Crane, \$11 million against Durco, and \$5 million against Byron Jackson.¹

Crane now seeks judgment notwithstanding the verdict, a new trial absolute, and a new trial nisi remittitur. It contends that there was no competent evidence that Mr. Garvin was exposed to asbestos gaskets and packing supplied by Crane. Crane further challenges the jury's willful and wanton finding, and the amounts of both the compensatory and punitive damages awards.

II. Ruling on Motion for Judgment Notwithstanding the Verdict and New Trial Absolute

A. Standard of Review

In ruling on a motion for JNOV, the trial judge must view the evidence and all reasonable inferences therefrom in the light most favorable to the non-moving party. JNOV should be granted when only one reasonable inference can be drawn from the evidence and no reasonable jury could have reached the challenged verdict. The trial judge does not have authority to decide credibility or resolve conflicts in the evidence. Curcio v. Caterpillar, Inc., 355 S.C. 316, 585 S.E.2d 272 (2003); Welch v. Epstein, 342 S.C. 279, 536 S.E.2d 408 (Ct. App. 2000).

If the amount of the verdict is so grossly inadequate or excessive that it shocks the conscience of the court and clearly indicates the amount was the result of passion, caprice, prejudice, partiality, corruption, or some other improper motive, the trial judge is required to

¹ Plaintiffs resolved their claims with Durco and Byron Jackson post-verdict.



grant a new trial absolute. Cock-N-Bull Steak House, Inc., v. Generali Ins. Co., 321 S.C. 1, 466 S.E.2d 727 (1996); Vinson v. Hartley, 324 S.C. 389, 477 S.E.2d 715 (Ct. App. 1996).

B. Exposure

Crane contends there was insufficient evidence for the jury to find Mr. Garvin was substantially exposed to asbestos gaskets and packing provided by Crane at the time the valves were sold to his work sites. The court disagrees. There is substantial evidence that Crane supplied asbestos gaskets and packing in the valves it sold to the Graniteville and Carolina Eastman plants, including Crane documents specific to those plants. There was testimony from Mr. Garvin and Mr. Ridgell indicating that Mr. Garvin did the first maintenance job on Crane valves that were newly installed by either Mr. Garvin or other workers. This was not an isolated or unique scenario, as it was part of Mr. Garvin's job to repair and rebuild Crane valves. When he repaired a Crane valve, Mr. Garvin had to scrape off the asbestos gaskets and remove the asbestos packing in a manner that created visible dust in the air.

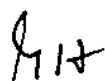
Crane argues that Mr. Garvin only had exposure to asbestos flange gaskets and points to Mr. Garvin's testimony that he did not work on bonnet gaskets. The jury also heard evidence, however, that he worked on gaskets internal to Crane valves, including Mr. Garvin's testimony that he worked on the gasket on the top of the Crane valve, Mr. Ridgell's testimony that Mr. Garvin had to clean the face of the valve, and Dr. Holstein's review of the evidence showing that Crane valves came from the factory with internal gaskets in place and that Mr. Garvin would have been exposed to those internal gaskets when working on Crane valves. Crane's corporate witness, Anthony Pantaleoni, acknowledged there was evidence of Mr. Garvin's work on internal gaskets on valves.



Crane contends Dr. Holstein engaged in improper speculation in testifying that Crane valves contained asbestos and that Mr. Garvin was exposed to asbestos materials originally supplied with Crane equipment. Dr. Holstein's testimony was not speculative. It was based on a proper foundation in the fact testimony and documentary evidence in this case, as well as his knowledge and experience of the historical use of asbestos materials in valves in industrial settings.² Dr. Holstein has spent years evaluating asbestos health hazards in plants and factories, interviewing hundreds of workers for epidemiological research. He teaches industrial hygienists and relies on their work to evaluate exposures that cause disease. This broad knowledge about the use of asbestos gaskets and packing as the only available material for hot systems during the relevant time period was sufficient to support his testimony that Crane valves contained asbestos. Dr. Holstein was relying on numerous other sources, however, including Mr. Garvin's testimony that he was working with asbestos gaskets, Crane testimony that its valves were designed for use with asbestos, and site-specific documents that indicated all the Crane valves at Carolina Eastman contained asbestos gaskets or packing. His testimony conformed to the requirement that an expert may base an opinion on facts or data "perceived by or made known to the expert at or before the hearing." Rule 703, SCRE.

Dr. Holstein's testimony about Garvin's exposure was helpful to the jury and did not implicate any Rule 403 concerns. His specialized knowledge assisted the jury in understanding the evidence and determine an important fact in issue. Rule 702, SCRE. Dr. Holstein's expertise in teaching others about asbestos exposure and disease helped the jury understand the testimony

² A defense expert (Dr. Roggli) similarly testified that gaskets used in steam applications, like those described by Mr. Garvin, were likely asbestos-containing in the 1960s and 1970s.



and documents regarding Mr. Garvin's work with Crane valves and exposure to original asbestos materials from that work. Dr. Holstein's testimony complied with all requirements for scientific expert witnesses and was properly presented to the jury. See Watson v. Ford, 389 S.C. 434, 699 S.E.2d 169 (2010); State v. White, 382 S.C. 265, 676 S.E.2d 684 (2009).

Although Dr. Holstein's testimony was directed at one of the central issues in this case, "[t]estimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact." Rule 704, SCRE. Dr. Holstein's testimony aided the jury but did not tell them what result to reach or otherwise usurp their function. Hughes v. Children's Clinic, P.A., 269 S.C. 389, 403, 237 S.E.2d 753 (1977). The court notes that defense expert Charles Blake offered opinions about Mr. Garvin's work practices and asbestos exposures, reaching the opposite conclusion that there was no evidence of any exposure to asbestos products made or supplied by Crane. The jury properly considered both sides of this issue, and its resolution in Plaintiffs' favor is supported by competent evidence, including the testimony of Dr. Holstein.

C. Stream of Commerce / Foreseeable Use

Crane claims that it was error to instruct the jury that "[a] Defendant cannot, however, be liable for an allegedly defective product it did not design, recommend, specify, require, manufacture, sell or place in the stream of commerce." (TT 9/11/13, at 207). Crane maintains that it can only be liable for products it placed in the stream of commerce, and has no liability for asbestos materials it only recommended, specified, or required.

A close, fair reading of the charge as a whole does not support Crane's strained position. The court charged the jury repeatedly that a Defendant manufacturer could only be held

responsible for a product that (a) was defective at the time it left the Defendant's hands and (b) Defendant placed in the stream of commerce. The jury was told at least 14 different times about these concepts. South Carolina law provides, and the jury was charged, that under any products liability theory, the plaintiff must show that "the product at the time of the accident was in essentially the same condition as when it left the hands of the defendant," 5 Star, Inc. v. Ford Motor Co., 408 S.C. 362, 759 S.E.2d 139 (2014); Bragg v. Hi-Ranger, Inc., 319 S.C. 531, 539, 462 S.E.2d 321, 326 (Ct. App. 1995); (TT 9/11/13, at p. 199), and the product is "expected to and does reach the user or consumer without substantial change." S.C. Code Ann. § 15-73-10(1)(b); (TT 9/11/13, at p. 199).

At no point was the jury instructed that a manufacturer could be liable for products it did not itself place in the stream of commerce. In fact, the sentence Crane criticizes follows a sentence discussing a manufacturer's liability for incorporating a defective component part into its own product. Despite Crane's concern, nowhere in the charge is the phrase "replacement parts" used.

Crane further claims the jury charge improperly used the word "specify." To the extent Crane's argument can be followed, it appears to claim the word "specify" would befuddle the jury. Crane argues that "specify" is "inherently vague and subject to multiple interpretations." Crane Motion for Post-Trial Relief at 7 n. 5. Crane may find the word "specify" to be hopelessly confusing, but no reasonable juror would. The word has a well-established, lucid meaning that has been passed down for centuries. The American Heritage Dictionary defines it as meaning "[t]o state explicitly," Webster's Third New International as "to mention or name in a specific or explicit manner; tell or state precisely or in detail," and The Oxford English Dictionary as "[t]o

mention, speak of, or name (something) definitely or explicitly." Blackstone did not find the word troublesome in a legal setting. See Blackstone, Commentaries on the Laws of England II at 319 (1766) ("But then there must many requisites be observed, which the statute specifies, otherwise such leases are not binding."). Crane fails to explain how there could be any confusion about the meaning of the word "specify" in the context in which it was used. The Court is confident the jury understood manufacturers may be specific about the component parts to be used in their products, just as manufacturers may also "recommend" or "require" particular components.

Crane argues the charge instructed the jury that it could find a manufacturer liable if the manufacturer merely specified, recommended or required a product it neither made, sold or placed in the stream of commerce. Accepting Crane's premise would entail a finding that the jury failed to follow the charge as a whole (which repeated ad nauseum the stream of commerce and defendant control requirements), and an order by this trial court defying South Carolina's longstanding product liability law regarding foreseeable use. What Crane is really driving at is adoption of the "bare metal defense" by a South Carolina court. The term "bare metal" is misleading and, as used here, is semantic advocacy rather than a useful doctrinal description. There is no evidence Crane sold "bare metal" valves or pumps; in fact, the evidence is to the contrary. The record demonstrates that Garvin was exposed to substantial and medically causative levels of asbestos dust when working on or replacing original Crane products that contained asbestos placed by Crane directly into the stream of commerce. Despite this stubborn fact, Crane contends that when its original asbestos parts wore out, the pump or valve somehow disappeared from the stream of commerce, even though it remained as an integral, working part

of a massive industrial plant. Crane argues its legal responsibility ceased when the asbestos it supplied no longer accompanied the product.

Crane seeks to align this case with O'Neil v. Crane Co., 53 Cal.4th 335, 266 P.3d 987 (Cal.2012) where the California Supreme Court held that "a product manufacturer may not be held liable in strict liability or negligence for harm caused by another's product unless the defendant's own product substantially contributed substantially to the harm, or the defendant participated substantially in creating a harmful combined use of the products." Id., 266 P.3d at 991. The immovable obstacle to Crane's efforts is the record, particularly evidence that Mr. Garvin experienced substantial asbestos exposure to original Crane asbestos products. Even if this exposure never occurred, it was undisputed Crane placed into the stream of commerce products that not only contained asbestos, but specified they be replaced by asbestos parts. Such a scenario was explicitly mentioned by O'Neil as a problem its ruling did not address.³ Viewed objectively, the manufacturer's product—defective when it left Crane's hands because it contained asbestos and specified asbestos for future use—remained defective and unreasonably dangerous when its specifications were heeded not only by its owner/user, but by another

³ O'Neil noted that there was no evidence the Plaintiff was exposed to original asbestos products manufactured by Defendants. It also emphasized that the lack of evidence that Defendants specified asbestos be used for replacement gaskets or packing. O'Neil, 266 P.3d at 996 (finding Defendants "did not mandate or advise that [asbestos] be used with their products... the products were designed to meet the Navy's specifications. Moreover, there was no evidence that Defendant's products required asbestos-containing gaskets or packing in order to function."). These observations led the court to carefully explain the limited nature of its holding: "...[I]f the product manufactured specified or required the use of a defective replacement part, a stronger case could be made that the manufacturer's failure to warn was a proximate cause of resulting injury... These difficult questions are not presented in the case before us, and we express no opinion on their appropriate resolution." Id. at n. 6.

manufacturer. These facts would enable a jury to find a "combined use" sufficient to remove Mr. Garvin's exposure from O'Neil's reach.

No jurisdiction has approved the "bare metal" defense in the teeth of such specification evidence. The only federal court of appeals that has approved the defense did so on the basis that the Plaintiff could show no exposure to asbestos products manufactured by the Defendants. Lindstrom v. A-C Product Liability Trust, et al., 424 F.3d 488 (6th Cir. 2005). But Lindstrom did not involve or address the issue of whether the Defendants specified asbestos-containing replacement parts. Judge Robreno, the MDL judge for federal asbestos claims, relied heavily on Lindstrom in holding the bare metal defense applicable in maritime cases, Conner v. Alfa Laval, Inc., 842 F.Supp.2d 791 (E.D.Pa.2012), but there too no evidence of exposure to Defendants' original asbestos products or specifications appeared in the record. Id. at 802. Likewise, the sharply divided "bare metal" decisions of the Washington supreme court did not confront this precise issue, and that court has sheepishly realized the awkward logical limits of the principle. Compare Braaten v. Saberhagen Holdings, Inc., 198 P.3d 493 (Wash. 2008) (no evidence Defendants manufactured, recommended or specified replacement asbestos gaskets or packing) with Macias v. Saberhagen Holdings, Inc., 282 P.3d 1069 (Wash. 2012) (respirator manufacturer not entitled to summary judgment even though it did not manufacture asbestos products to which plaintiff exposed; distinguishing Braaten and finding that respirator was specifically designed for use that would inherently cause exposure).

O'Neil and other cases adopting the "bare metal" defense lean on Baughman v. General Motors Corp., 780 F.2d 1131 (4th Cir. 1986). Baughman dealt with tire rims, not asbestos. It is a decision best restricted to its facts. Mr. Baughman was injured when a CR-2 rim assembly

exploded while he was changing a tire on a 1979 GMC truck. It was undisputed that GM did not design, manufacture, require or specify the use of the CR-2. The original rim assembly was a CR-3, which has a different design. The Fourth Circuit held as follows:

Where, as here, the defendant manufacturer did not incorporate the defective component part into its finished product and did not place the defective component into the stream of commerce, the rationale for imposing liability is no longer present. The manufacturer has not had an opportunity to test, evaluate, and inspect the component; it has derived no benefit from its sale; and it has not represented to the public that the component part is its own.

780 F.2d at 1132-33. The court did not discuss whether the result would have been different had GM specified the defective rim assembly. This is a fundamental point, for there was no claim that the original GM rim assembly was defective.

This latter fact also upends Crane's reliance on the policy rationales often articulated in support of the "bare metal" concept. Unlike GM, Crane had the opportunity to test and evaluate the asbestos gaskets and packing used in its valves and which injured Mr. Garvin (the jury was even given factors to use in deciding Crane's duty to test). There was no evidence the replacement gaskets and packing manufactured by others were different in material or design from Crane's original supplied products or specifications. The evidence showed Crane long knew of the risk asbestos posed, and it occupied the best position in the chain of distribution to warn consumers of those risks. Crane knew asbestos gaskets and packing would not last as long as its bare metal valves or pumps; consequently it knew those parts would have to be replaced, and replaced with similar if not identical parts whose manufacture was guided by Crane's design and specifications. To say Crane was no longer part of the "chain of distribution" when the original gaskets and packing wore out on its still-functioning product would be artificial, if not



silly. The drafters of the Restatement of Torts (Second) § 402A well understood these practicalities:

... the justification for the strict liability has been said to be that the seller, by marketing his product for use and consumption, has undertaken and assumed a special responsibility toward any member of the consuming public who may be injured by it; that the public has the right to and does expect, in the case of products which it needs and for which it is forced to rely upon the seller, that reputable sellers will stand behind their goods; that public policy demands that the burden of accidental injuries caused by products intended for consumption be placed upon those who market them, and be treated as a cost of production against which liability insurance can be obtained; and that the consumer of such products is entitled to the maximum of protection at the hands of someone, and the proper persons to afford it are those who market the products.

Id. at Comment c. These comments have been incorporated by reference and codified as the official legislative intent of our strict liability statute for over 40 years. S.C. Code § 15-73-30.

In a recent thoughtful opinion, a federal district court in Chicago set forth the most sensible approach to the "bare metal" defense. Quirin v. Lorillard Tobacco Co., 2014 WL 804305 (N.D. Ill. 2014). Mr. Quirin claimed his mesothelioma arose in part from exposure to asbestos while working with Crane valves as a machinist on the *USS Tolovana* from 1954-1957. The *Tolovana* utilized over 1000 Crane valves, some of which contained internal asbestos gaskets and packing. Crane also sold asbestos gaskets and packing, some of it purchased from third parties. The original gaskets and packing Crane supplied had likely been replaced before Quirin began service, and he could not specifically recall whether he had ever changed out packing original to a Crane valve. Indeed, there was "no direct evidence that Crane Co. supplied any replacement gaskets or packing that Mr. Quirin used on board." Id. at 3.

Crane moved for summary judgment, asserting it had no legal duty to warn Mr. Quirin of the danger of asbestos materials manufactured and supplied by others. Crane argued there was no evidence Mr. Quirin had any exposure to asbestos-containing products it had placed in the stream of commerce. Applying maritime law, the court held:

In general, consistent with the bare metal defense, a manufacturer is not liable for materials it did not supply. But a duty may attach where the defendant manufactured a product that, by necessity, contained asbestos components, where the asbestos-containing material was essential to the proper functioning of the defendant's product, and where the asbestos-containing material, whether supplied by the original manufacturer or someone else.

Furthermore, even if replacement gaskets and packing for the Crane Co. valves were supplied by a third party, it is reasonable to infer that those replacement parts would have been substantially identical to the components originally supplied by Crane Co. Given these facts, a reasonable jury could find that Crane Co. had a duty to warn about the hazards of asbestos exposure resulting from work on its valves...

The court acknowledges that its conclusion differs from that reached by those courts that have relied on the "bare metal defense" to strictly limit liability where a manufacturer did not make the actual product allegedly causing asbestos exposure. It is not convinced, however, that a manufacturer should avoid liability on a failure-to-warn theory, where it designed its products to be used with asbestos-containing materials into the products it sold. On those facts, a jury could conclude that it was not just foreseeable, but inevitable, that the product would subject those working with it to the possible hazards of asbestos exposure. The manufacturer of the product was in a position to warn of dangers apparent at the time the product was sold.

Id. at 8.

Although Crane protests there was no evidence that it required the use of asbestos gaskets and packing with its valves, the evidence was sufficient to create a fact issue for the jury. Plaintiffs presented Crane manuals and drawings from Carolina Eastman that list asbestos

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gaskets or packing as component parts in every valve Crane sold to that facility. There was also evidence that Crane generally designed its valves to be used with asbestos gaskets and packing, and also designed its valves with flanged connections that required asbestos gaskets, versus other connection designs not requiring gaskets.

Crane anticipated that maintenance workers would break down valves, open them up, and change the gaskets and packing. There was also evidence that Crane sold asbestos packing, internal gaskets, flange gaskets, and insulation as replacement parts for use with its valves, including the brand of gaskets used by Mr. Garvin. Mr. Ridgell testified that he would go to the valve manufacturer for replacement gaskets. Carolina Eastman records show Crane included asbestos gaskets and packing in spare parts kits. Crane recommended that work sites keep asbestos gaskets and packing as spare parts for Crane valves. Crane recommended the use of asbestos gaskets, particularly on steam systems, which is the exact type of applications fact witnesses described were in place at Carolina Eastman and Graniteville. Such evidence raises a reasonable inference that asbestos gaskets and packing were required component parts of Crane valves.

The Court finds evidence sufficient for the jury to conclude that when Mr. Garvin worked on Crane valves, the valves were in “essentially the same condition as when [they] left the hands of the defendant.” Bragg, 319 S.C. at 539. Crane placed the injury-causing product in the stream of commerce, and there was ample evidence that Mr. Garvin worked on original Crane valves and gaskets. Crane’s liability arises because its own valves caused injury as manufactured, supplied, and designed by Crane with asbestos gaskets and packing. When the asbestos gaskets and packing were replaced with the same materials that came with the valve, it was not a

“substantial change” in the condition of the product. The product remained the same as when sold—valves containing asbestos gaskets and packing.

Mr. Garvin’s injury was caused by gaskets and packing that were no different than the gaskets and packing that came with the valves originally. Crane designed and sold its product with asbestos parts that were wear items that Crane knew had to be replaced, there was evidence that the replacement process itself created exposure to toxic asbestos dust, and the replacement parts were to Crane’s design specifications.

In sum, the court finds the jury charge conformed to established South Carolina law that a manufacturer’s liability extends to foreseeable dangers resulting from the anticipated or intended use of its products. See Spruill v. Boyle-Midway, Inc., 308 F.2d 79, 84 (4th Cir. 1962); Fleming v. Borden, Inc., 316 S.C. 452, 458, 450 S.E.2d 589, 593; Claytor v. General Motors Corp., 277 S.C. 259, 262, 286 S.E.2d 129, 131 (1982); Carolina Home Builders, Inc. v. Armstrong Furnace Co., 259 S.C. 346, 359-60, 191 S.E.2d 774, 870 (1972); Mickle v. Blackmon, 252 S.C. 202, 233 (1969). A jury evaluates whether a product is unreasonably dangerous to the ordinary consumer according to the “conditions and circumstances that foreseeably attend the use of the product.” Bragg, 319 S.C. at 543; Claytor, 277 S.C. at 262. A manufacturer is “expected to anticipate the environment which is normal for the use of his product and . . . must anticipate the reasonably foreseeable risks of the use of his product in such environment.” Mickle, 252 S.C. at 233 (quoting Spruill, 308 F.2d at 83- 84). “[L]iability may be imposed upon a manufacturer or seller notwithstanding subsequent alteration of the product when the alteration could have been anticipated by the manufacturer or seller.” Small v. Pioneer Mach., 329 S.C. 448, 466, 494 S.E.2d 835, 844 (Ct. App. 1997).



The issues of whether Crane's valves were in essentially the same condition when Mr. Garvin worked on them, and whether Crane could reasonably foresee that the asbestos gaskets and packing in its valves would be replaced with asbestos materials, were for the jury. If a manufacturer recommends, specifies, or requires that asbestos gaskets and packing be replaced with like materials, then the jury may conclude that the product is in essentially the same condition as when it left the manufacturer, that the manufacturer anticipated the subsequent alteration of the product, and that the manufacturer anticipated the reasonably foreseeable risks of using the product in an environment where routine repair and maintenance would require replacement of asbestos components.

Crane had wide berth to convince the jury it was not liable for defective replacement parts, and its skilled trial counsel attempted to do so in a thorough and professional manner. In addition to the instructions set forth above, the jury was instructed on legal cause, which focuses on foreseeability. They were also charged on intervening cause, and the requirement that to be liable the Defendant's product must have been defective at the time it left Defendant's hands, was placed in the stream of commerce by Defendant, and its condition was not substantially changed up to the time it injured Mr. Garvin. The jury applied this law to the facts and found for Mr. Garvin on all issues.

D. Causation

Crane argues that there was insufficient evidence that Mr. Garvin's mesothelioma was caused by his exposure to asbestos from Crane products. The Court does not find merit in any of Crane's arguments.

1. Frequency, Regularity, Proximity

First, Crane contends that there was no admissible evidence of the frequency, regularity, and proximity of Mr. Garvin's work with asbestos materials in Crane valves, as required by Henderson v. Allied Signal, Inc., 373 S.C. 179, 644 S.E.2d 724 (2007). The frequency, regularity, and proximity factors are designed to evaluate whether there was "actionable exposure" to dust from the defendant's asbestos product. Id. at 185. Dr. Holstein and Dr. Maddox testified that Mr. Garvin has an asbestos-related mesothelioma, that mesothelioma can be caused by relatively brief and low level cumulative exposures, and that there is no known threshold of exposure below which mesothelioma does not occur.

Plaintiffs presented sufficient evidence to support the jury's causation finding against Crane in this case. This is not a situation of mere "presence in the vicinity of static asbestos." Henderson, 373 S.C. at 185. Rather, Mr. Garvin scraped asbestos gaskets from the face and flanges of Crane valves, and removed asbestos packing from Crane valves with a packing puller. Mr. Ridgell described seeing visible dust when Mr. Garvin used a grinder to remove asbestos gaskets. All of the Crane valves at Carolina Eastman contained asbestos, and asbestos was also used on the Crane valves at Graniteville. Dr. Holstein's testimony about Mr. Garvin's exposure to Crane-supplied asbestos materials had an adequate foundation and assisted the jury.

In terms of the duration of this work, there was evidence that Mr. Garvin worked on Crane valves throughout his career, at both Graniteville and Carolina Eastman, from 1964 until the 1990s. Mr. Ridgell testified it was Mr. Garvin's job to rebuild and change out pumps and valves for weeks at a time.

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Plaintiffs' experts discussed studies measuring asbestos fiber release from gaskets and packing up to 100,000 times higher than what is present in the background air, which are levels associated with doubling the risk for asbestos disease. Defense expert Dr. Roggli testified that there can be airborne asbestos at the level of 5 million particles per cubic foot and asbestos would still be invisible to the naked eye. He conceded that if a person can see asbestos dust, the level is well above background levels in the outside air.

Dr. Holstein testified about scientific research showing exposure to asbestos gaskets and packing is quite hazardous. Defense experts Dr. Roggli and Mr. Blake relied on the same studies, in which the authors state the need for protective measures when working with asbestos gaskets, describe exposures thousands of times higher than background, and quantify exposure levels from 1 fiber per cubic centimeter of air (f/cc) to 30 f/cc. Industry studies found similar results of 26 to 30 f/cc of asbestos released when working with asbestos gaskets. Other studies found the use of a grinder to remove asbestos gaskets, as Mr. Garvin did, releases asbestos at a level of 6.8 f/cc. Ten to twenty years before Mr. Garvin was last exposed to asbestos, the Bremerton study concluded that "asbestos, a fibrous mineral silicate which is a component of many gasket materials is a documented health hazard causing cancer and chronic lung disease known as asbestosis." (TT 9/9/13 at 145-46.) A study relied on by Crane's own experts found that gasket work releases asbestos at levels that "exceed all current and historical occupational safety and health administration excursion limits and some permissible excursion limits based on an 8 hour time weighted average." (TT 9/3/13 at 147-148; TT 9/9/13 at 136-137). Dr. Roggli also conceded that Material Safety Data Sheets from asbestos gasket suppliers Durabla, John Crane,



and Garlock, which supplied asbestos components sold by Crane, indicate that asbestos gaskets cause disease.

Based on the details of Mr. Garvin's exposure, Dr. Maddox concluded that asbestos exposures from scraping gaskets are orders of magnitude higher than the pollution in the ambient air (or background level). Dr. Maddox concluded Mr. Garvin's asbestos exposure from Crane valves was a substantial contributing cause of the development of his mesothelioma. Answering a hypothetical question based on facts later established by the evidence—including exposure to Garlock gaskets that contain 85%+ chrysotile asbestos, used over the span of three decades repeatedly with a grinder—defense expert Dr. Roggli testified that such exposure would substantially contribute to cause mesothelioma.

The evidence of Mr. Garvin's exposure to asbestos from Crane valves was more than sufficient to create a fact issue for the jury on the issue of causation.

2. Admissibility of Expert Causation Testimony

Crane challenges Plaintiffs' experts' causation opinion testimony as inadmissible and insufficient to establish causation under South Carolina law. The admissibility of expert testimony is governed by South Carolina Rule of Evidence 702, which provides that "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Courts evaluating the admissibility of scientific expert evidence "must find the evidence will assist the trier of fact, the expert witness is qualified, and the underlying science is reliable." State v. Council, 335 S.C. 1, 20, 515 S.E.2d 508 (1999); see also Watson v. Ford, 389 S.C. 434,

699 S.E.2d 169 (2010). While the trial court assesses the reliability of the expert's methodology, it is for the jury to determine the soundness of the facts underlying the expert's opinion and the correctness of his conclusions. See Milward v. Acuity Specialty Prods. Group, Inc., 639 F.3d 11, 22 (1st Cir. 2011).

Plaintiffs presented expert testimony from Dr. Arnold Brody, a cellular biologist specializing in the biological mechanisms of asbestos-related disease, Dr. Maddox, a board-certified pathologist with expertise in asbestos-related disease, and Dr. Holstein, a physician board-certified in occupational medicine and preventive medicine. The court finds each of these experts to be well-qualified to offer causation opinions, and finds their testimony reliable and helpful to the trier of fact.

Dr. Brody offered only general causation opinions and explained that it is the cumulative dose of asbestos that causes mesothelioma, because asbestos is a carcinogen and it is not possible to say that some doses of the carcinogen were not causative in the disease process. He also testified that numerous government agencies, including the EPA, OSHA, the National Cancer Institute, the World Health Organization (WHO), and the American Thoracic Society, have concluded that there is no safe level of exposure to asbestos.

Dr. Maddox is a board-certified anatomical and clinical pathologist who specializes in the diagnosis and attribution of mesothelioma. His specific causation opinions are based on fact witness testimony regarding the frequency, duration, and proximity of Mr. Garvin's exposure, Mr. Garvin's medical and pathology materials, Crane-specific documents, studies of the fiber release from asbestos gaskets and packing, and the peer-reviewed medical literature regarding the causation of mesothelioma. Mr. Garvin's exposures to asbestos gaskets from Crane valves

were several orders of magnitude above background levels, and constituted a significant component of his cumulative asbestos exposure that caused his mesothelioma. Dr. Maddox also testified about the reasonableness of Mr. Garvin's medical care, including that his medical bills to date were \$149,000, and that his medical expenses could be as much as \$300,000 more in the future.

Dr. Holstein is board-certified in occupational medicine and preventive medicine and has spent more than 40 years studying and teaching about the causation of asbestos-related disease in working environments. In addition to his consulting practice, he has been a Clinical Assistant Professor in the Division of Environmental Sciences at Mount Sinai School of Medicine since 1983 and has also served as a consultant to the National Cancer Institute and NIOSH. He evaluated Mr. Garvin's exposure according to the description of his work practices, the evidence of asbestos content in the valves present at Mr. Garvin's work sites, fiber release studies, and epidemiological studies of asbestos-related disease. He testified that Mr. Garvin's exposures from working with asbestos gaskets were 10,000 to 100,000 times above background levels. He determined that Mr. Garvin had frequent and regular exposure to original gaskets supplied with Crane valves and that these exposures were a substantial contributing cause of his mesothelioma.

Crane argues that Plaintiffs' expert medical witnesses testified that "every exposure to asbestos that Mr. Garvin sustained substantially contributed to cause his disease." The trial record does not contain any such testimony from any of Plaintiffs' experts. Ironically, the general acceptance of the opinion challenged by Crane is evidenced by testimony from its own expert, Dr. Victor Roggli, who has previously expressed the opinion that "each and every exposure to asbestos than an individual [with] mesothelioma experienced in excess of a background level is a



substantial contributing factor to the disease.” TT 9/3/13 at 70. Dr. Roggli also indicated that there is no known safe level of exposure to asbestos and that very low levels of exposure above background have been repeatedly demonstrated to cause mesothelioma, including peritoneal mesothelioma. Dr. Roggli testified that it is the total dose of asbestos, regardless of fiber type, that the patient experiences that causes the disease. These opinions were relevant, reliable, and admissible evidence for the jury to consider in evaluating causation.

There was evidence that the opinions expressed by Plaintiffs’ experts and Dr. Roggli, including that there is no safe level of exposure to asbestos and that mesothelioma can be caused by brief and low level exposures, are shared by numerous public health and regulatory agencies. These agencies include the EPA (“scientists have not been able to determine a ‘safe’ or threshold level for exposure to airborne asbestos”); OSHA (“There is no ‘safe’ level of asbestos exposure for any type of asbestos fiber. Asbestos exposures as short in duration as a few days have caused mesothelioma in humans.”); NIOSH (“[E]xcessive cancer risks have been demonstrated at all fiber concentrations studied to date. Evaluation of all available human data provides no evidence for a threshold or for a ‘safe’ level of asbestos exposure.”); the Consumer Products Safety Commission (“The Commission has noted that in the scientific literature there is general agreement that there is no known threshold level below which exposure to respirable free-form asbestos would be considered safe.”); the WHO (“there is no safe threshold level of exposure”); and the World Trade Organization (finding “on the basis of scientific evidence that ‘no minimum threshold of level of exposure or duration of exposure has been identified with regard to the risk of pathologies associated with chrysotile, except for asbestosis”). These authorities support the court’s finding that Plaintiffs’ experts’ opinions are not only reliable and helpful to the trier of

fact, but also supported the jury's finding that Mr. Garvin developed mesothelioma from breathing asbestos fibers from Crane valves.

3. But-For Cause

The jury was instructed that to prove proximate causation in a negligence case, it must find that the injury would not have occurred "but for" the defendant's negligence. Such evidence was not lacking in this case.

The jury heard expert testimony that there is an inverse relationship between the dose or amount of asbestos a person breaths and the latency period of the disease. If the cumulative dose of asbestos is increased by exposure to asbestos products, then that shortens the latency period and causes the disease to develop more quickly. The court finds that this evidence that the latency of Mr. Garvin's disease was affected by his exposure to asbestos from Crane valves is sufficient to raise a genuine issue of material fact for the jury regarding but-for causation.

E. Knowledge Evidence

Crane contends that certain statements in trade association journals and other documents about the hazards of asbestos were inadmissible hearsay. The statements had been received by Crane from outside sources and were offered on the issue of notice. These statements were therefore not hearsay, as they were not offered for the truth of the matter asserted. Rule 801(c), SCRE. The hearsay rule does not apply to evidence offered solely to prove notice, as that relates to state of mind. Player v. Thompson, 259 S.C. 600, 193 S.E.2d 531 (1972) (testimony that motor vehicle inspector told defendants prior to accident that car's tires were unsafe); Smedra v. Stanek, 187 F.2d 892 (10th Cir. 1951) (testimony "that Dr. Stanek had been told by someone in the operating room that the sponge count did not come out right"). Testimony to show notice of a

fact and not the fact itself is not hearsay. Baber v. Greenville Cty., 327 S.C. 31, 41, 488 S.E.2d 314, 319 (1997).

Crane specifically complains about the admission of testimony from its corporate representative, Mr. Pantaleoni, regarding a letter from a Crane customer, Foster Wheeler, stating that health hazards had been shown from minimal exposures. Evidence that Crane received that letter and had notice of the contents of that letter was not hearsay. The Court excluded the letter under Rule 403, SCRE, however. Although it was inadvertently shown to the jury in violation of this ruling, this was a harmless error because it was cumulative of other notice evidence already in the case. See Ramos v. Hawley, 316 S.C. 534, 536, 451 S.E.2d 27, 28 (Ct. App. 1994); Sligh v. Johnson, 288 S.C. 364, 367, 342 S.E.2d 620, 622 (Ct. App. 1986). In addition, Crane later opened the door to this evidence by presenting testimony from Mr. Pantaleoni claiming that Crane had no knowledge that asbestos gaskets and packing were harmful. The Foster Wheeler letter was therefore admissible as impeachment evidence to contradict Mr. Pantaleoni's claim, in addition to being relevant on the issue of notice.

Crane also objects that a document from the American Petroleum Institute (API) was inadmissible hearsay. The receipt and contents of this document were properly discussed on cross-examination of Mr. Pantaleoni and Dr. Roggli because the evidence was offered to show that Crane had access to information from API about asbestos hazards. Communications from trade organizations such as API to a defendant or management-level employee of the company are not hearsay when offered to show the information that Crane received about health concerns associated with asbestos exposure. The question of what was known and knowable to asbestos manufacturers is always a highly relevant area of inquiry in any asbestos case, and

communications to the defendant from a variety of sources may be offered to show notice to a defendant.

F. S.C. Code § 15-38-15

Crane contends that that settled parties should have been allocated fault at trial. The short answer to this is that § 15-38-15 is inapplicable because the jury determined Crane's conduct to be willful and wanton. S.C. Code § 15-38-15(E). Even were this not true, the plain language of S.C. Code § 15-38-15 allows apportionment of fault only among the trial defendants. The legislature repeatedly refers to "defendants" in the pertinent sections of the statute. See S.C. Code Ann. § 15-38-15(A) ("[I]f indivisible damages are determined to be proximately caused by more than one *defendant*, joint and several liability does not apply to any *defendant* who conduct is determined to be less than fifty percent of the total fault for the indivisible damages as compared with the total of: (1) the fault of all the *defendants*; and (ii) the fault (comparative negligence), if any, of the plaintiff."); § 15-38-15(A) ("A *defendant* whose conduct is determined to be less than fifty percent of the total fault shall only be liable for that percentage of the indivisible damages determined by the jury or trier of fact."); § 15-38-15(B) ("Apportionment of percentages of fault among *defendants* is to be determined as specified in subsection (c)."); § 15-38-15(C)(3) ("The jury . . . shall . . . upon a motion by at least one *defendant*, where there is a verdict . . . against two or more *defendants* for the same indivisible injury . . . specify in a separate verdict . . . the percentage of liability . . . that is attributable to each *defendant*."); § 15-38-15(C)(3) ("In determining the percentage attributable to each *defendant*, any fault of the plaintiff . . . will be included so that the total of the percentages of fault attributed to the plaintiff and to the *defendants* must be one hundred percent."); § 15-38-15(E) ("Notwithstanding the

application of this section, setoff from any settlement received from any potential tortfeasor prior to the verdict shall be applied in proportion to each *defendant's* percentage of liability as determined pursuant to subsection (c).”).

The Legislature specifically chose the term “defendant” rather than “nonparty,” “released party,” or some other term. The Legislature meant what it said. Connecticut Nat. Bank v. Germain, 503 U.S. 249, 253-54 (“Courts must presume that a legislature says in a statute what it means and means in a statute what it said there.”). Giving the term its plain and ordinary meaning, a defendant is “[a] person sued in a civil proceeding” Black’s Law Dictionary 482 (9th ed. 2009). Placing nonparties on the verdict form for apportionment of fault would contravene the express terms of the statute.

While it is true that § 15-38-15 (D) provides that Defendants “retain the right to assert that another potential tortfeasor, whether or not a party, contributed to the alleged injury...,” the provisions of the statute dealing with verdict forms and how to practically apportion fault restrict their application to “defendants,” i.e. parties. Subsection (D) retains a Defendant’s right to argue non-party fault at trial even though the non-party does not appear on the verdict form, a right Crane exercised.

Any ambiguity in the statute may be resolved by considering its purpose when it was passed in 2005 to modernize joint and several liability. Construing the statute as a whole, and interpreting it in a practical, reasonable manner in accord with its purpose, see State v. Sweat, 688 S.E.2d 569, 575 (2010), the court finds that § 15-38-15 does not permit a jury to assess the fault of non-parties on the verdict form. The legislature chose its words carefully, and while subsection (D) mentions non-parties, there is no mechanism allowing them a place on the verdict

from. When a legislature includes particular language in one section of a statute but omits it in another, it is presumed to have done so deliberately. Russello v. United States, 464 U.S. 16, 23 (1983).

The legislative history sheds further light. Two unadopted versions of the Bill proposed language that Crane now seeks to have this court make the law. See Shaw, Limited Joint and Several Liability Under Section 15-38-15: Application of the Rule and the Special Problem Posed by Nonparty Fault, 58 S.C. Law. Rev. 627, 633-34 (2007) (referring to prior versions of H.B. 3008 referred to House Judiciary Committee). The legislature's "rejection of the very language that would have achieved the result" Crane urges "weighs heavily" against Crane's interpretation. Hamdan v. Rumsfeld, 548 U.S. 557, 579-80 (2006).⁴

A statute's words must be construed in context and in light of the intended purpose of the statute in a manner, which harmonizes with its subject matter and accords with its general purpose. In re Manigo, 398 S.C. 149, 729 S.E.32 (2012). The purpose of §15-38-15 was to end joint and several liability for *defendants* with less than fifty percent fault. Limiting the meaning of "defendants" to the parties on the verdict form maintains this purpose, as defendants are free to argue they have no fault or less than fifty percent of the fault. The successful defendant will enjoy the protection offered by the statute and avoid joint and several liability.

⁴ This principle of statutory interpretation regarding rejected proposed legislation should be known, especially in South Carolina, as *canis non insidiatus*, or "The Dog That Would Not Hunt," a corollary to the Canon of Canine Silence. See Koons Buick Pontiac GMC, Inc. v. Nigh, 543 U.S. 50, 73-74 (2004) (Scalia, J., dissenting) (coining Canon to spoof idea that legislative silence about a subject may be used as evidence of legislative intent). The Canon has roots in Justice Stewart's decision in Harrison v. PPG Industries, Inc., 446 U.S. 578, 592 (1980) ("In ascertaining the meaning of a statute, a court cannot, in the manner of Sherlock Holmes, pursue the theory of the dog that did not bark.").

In §15-38-15(C)(3), the percentages of fault of the plaintiff, if any, and that of the defendants must add up to one hundred percent. The court is certain the Legislature understood the law of percentages, and it left no percentage for allocation to non-parties. Roschen v. Ward, 279 U.S. 337, 339 (1929) (“[T]here is no canon against using common sense in construing laws as saying what they obviously mean.”) (Holmes, J.).

A jury simply cannot apportion fault to anyone other than the defendants at trial. The rule that the Plaintiff alone has the right to determine which tortfeasor to sue is a "firmly entrenched common law principle," Chester v. S.C. Dep. Pub. Safety, 388 S.C. 343, 346, 698 S.E.2d 559 (2010), of which the Legislature was presumptively aware and intentionally chose not to disturb. See Fagnant v. K-Mart Corp., 2013 WL 6901907 (D.S.C. 2013) (reaching same interpretation of section 15-38-15).

G. Jury Conduct

Crane questions the jury's empanelment and deliberations because it alleges that the trial lasted longer than the jury was originally told it would and the jury deliberated less than three hours. When a party alleges irregularities in the jury's deliberations, “[t]he test is whether there is reason to suppose outside influences affected the jury's verdict.” Parker v. Evening Post Publ. Co., 317 S.C. 236, 248, 452 S.E.2d 640, 647 (Ct. App. 1994). The court evaluates such a claim based on its “opportunity to view the trial, the character and intelligence of the jurors, and to consider whether the verdict, in light of the evidence, has so little support as to indicate corrupt or improper influence.” Id.

There is no evidence the jury's verdict was affected by any improper outside influence. At the end of the second week of trial, the jury was informed the trial would continue into the

next week. The forelady discussed the matter with the jury members and informed the Court that no jurors had indicated they could not be present for an additional week. The jury was consulted about any scheduling conflicts due to the three extra days of trial, and those were accommodated. One juror expressed concern that two other jurors showed up late for trial one day, but she assured the court that this would not compromise her duties as a juror. In fact, the two she had a complaint about were alternate jurors who did not take part in deliberations.

The jurors were highly attentive throughout the trial and approached their duties studiously. The jury managed its time well, and their efficient deliberations cannot be spun as a signal that some sinister force was at work. See Becker v. Wal-Mart Stores, Inc., 339 S.C. 629, 636, (Ct. App. 2000). The deliberations were not unreasonably brief, and it is quite common for long trials to end with short deliberations, for the human mind can concentrate quite effectively when it has been adequately prepared. Id.; see also Curtis v. Blake, 392 S.C. 494, 504-505 (Ct. App. 2011) (brevity of jury deliberations alone does not suffice as a reason to set aside the verdict); Youmans ex rel. Elmore v. S.C. Dept. of Transp., 380 S.C. 263, 283, 670 S.E.2d 1, 11 (Ct. App. 2008) (noting the trial court should not base a decision on a thirteenth juror new trial motion on the brevity of jury deliberations).

Crane claims a new trial is warranted because the large amount of damages awarded could only be the result of “considerations not reflected by the evidence.” It accuses the jury of reaching its verdict as a “result of passion, caprice, prejudice, partiality, corruption or some other improper motives.” The Court cannot agree. As noted, the Court observed the jury to be conscientious, thoughtful, and properly focused on the evidence. Many of the jurors were avid note takers. They came from a wide variety of backgrounds, including a forensic technician for

the Federal Bureau of Investigation, a senior manager for the American Red Cross, a car mechanic, a maintenance worker at a nursing home, a retired Army soldier, a dental hygienist, a self-employed national security investigator, a retired social worker, an office manager, a nurse, a certified medical assistant at the Richland County Jail, and a retail manager. This rather diverse group reached a unanimous verdict for Plaintiffs on all questions.

While the jury did decide on a large award, the Court has no reason to conclude it was the result of any improper motive or outside consideration. Placing a value on pain and suffering is inherently subjective. In the Court's estimation, the members of the jury performed their civic duty admirably throughout the course of the three-week trial.

H. Willful and Wanton Conduct

Crane next argues there was insufficient evidence to support the jury's finding that its conduct was willful, wanton, or reckless, and that the jury's award of punitive damages should therefore be vacated. The record, however, contains ample evidence to support the jury's determination that Crane's conduct warranted punitive damages.

Plaintiffs presented sufficient evidence of Crane's knowledge of asbestos health hazards to raise a fact question for the jury regarding Crane's willful, wanton, and reckless conduct. Plaintiffs' evidence showed that Crane knew or should have known about the dangers of its products. Both categories of evidence are relevant in evaluating whether Crane's conduct was willful, wanton, and reckless, and in assessing punitive damages.

There was evidence that Crane had access to knowledge since the 1930s that asbestos exposure causes fatal disease. Thus, Crane knew of asbestos hazards approximately 50 years before Mr. Garvin's last exposure to asbestos from Crane valves. Crane knew about the



possibility that asbestos exposure could cause cancer as early as 1957. It knew about the risk of mesothelioma from exposure to asbestos products in the 1960s. It knew that the risk decreased when exposure levels decreased. Crane does not deny that it knew about the health hazards of asbestos exposure in the 1970s, including the risk of cancer and mesothelioma. Crane is aware of the EPA's position that there is no known safe level of exposure to asbestos.

The jury was presented with evidence that Crane continued to sell asbestos-containing materials years after it had actual knowledge of the danger, including up into the 1980s when Mr. Garvin was still working with Crane valves. Crane did not test its products and never warned. Crane did not pass on warnings it received from asbestos gasket suppliers in the 1980s. Dr. Roggli testified that where asbestos products release fibers above background and carry no conspicuous warning, the product is unreasonably dangerous. Crane told the jury that even knowing everything it does now, Crane would not have done anything differently today.

Plaintiffs also presented evidence that the magnitude of the risk is quite significant. The EPA has found that even one year of exposure at current limits of 0.1 f/cc could cause death and disease. 100,000 people die yearly from asbestos-related disease, and Crane is aware of that. Asbestos exposure contributes to 1 of 3 cancer deaths in the occupational setting in the U.S.

Crane argues that its conduct cannot be considered willful, wanton, and reckless because it was consistent with that of other manufacturers in the industry. Crane failed to point to any evidence in support, but even if it had, it would not preclude a finding of willful and wanton

conduct. Industry standards may be probative, but never dispositive. See Reed v. Tiffin Motor Homes, Inc., 697 F.2d 1192, 1198 (4th Cir. 1982).⁵

I. Punitive Damages

"[P]unitive damages serve at least three important purposes: punishment of the defendant's reckless, willful, wanton, or malicious conduct; deterrence of similar future conduct by the defendant or others; and compensation for the reckless or willful invasion of the plaintiff's private rights." Clark v. Cantrell, 339 S.C. 369, 379, 529 S.E.2d 528, 533 (2000). Those purposes are served by an award of punitive damages in this case.

Although reviewable for compliance with due process, James v. Horace Mann Ins. Co., 371 S.C. 187, 194, 638 S.E.2d 667, 670 (2006), a jury's punitive damages award is "entitled to a strong presumption of validity." TXO Production Corp. v. Alliance Res. Corp., 509 U.S. 443, 453 (1993). In Mitchell v. Fortis Ins. Co., 385 S.C. 570, 686 S.E.2d 176 (2009), the South Carolina Supreme Court set forth three guideposts to be applied in conducting a post-judgment

⁵ The frail idea that one's culpability is lessened by the fellow fault of one's company was memorably rejected long ago by Judge Learned Hand:

Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It may never set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission.

The T.J. Hooper, 60 F.2d 737, 740 (2d Cir.), cert. denied 287 U.S. 662 (1932); see also Wilson v. Bradlees of New England, Inc., 96 F.3d 552 (1st Cir. 1996) ("Industry standards serve many useful purposes, but we do not think Congress, if squarely asked to address the issue, would say that such a standard should extinguish a common-law claim of design defect. If the Defendant wants to show that they met a prevailing industry standard, fine; but this should not preclude a Plaintiff from showing that industry should have done more under certain conditions.") The jury here was charged on the limited relevance of "industry standards."

review of a punitive damages award: “(1) the degree of reprehensibility of the defendant's misconduct; (2) the disparity between the actual and potential harm suffered by the plaintiff and the amount of the punitive damages award; and (3) the difference between the punitive damages awarded by the jury and the civil penalties authorized or imposed in comparable cases.” Austin v. Stokes-Craven Holding Corp., 387 S.C. 22, 691 S.E.2d 135, 150-151 (2010). These guideposts incorporate the relevant factors set forth in Gamble v. Stevenson, 305 S.C. 104, 406 S.E.2d 350 (1991) and BMW of North America v. Gore, 517 U.S. 559 (1996). See Mitchell, 385 S.C. at 587. The jury was properly charged on these factors, and their findings by clear and convincing evidence, of Crane's willful, wanton and reckless conduct is firmly anchored in the record.

Reprehensibility is the most important consideration, Mitchell, 385 S.C. at 587, for the simple reason that some things are worse than others. A number of factors are relevant to reprehensibility, including whether: “(i) the harm caused was physical as opposed to economic; (ii) the tortious conduct evinced an indifference to or a reckless disregard for the health or safety of others; (iii) the target of the conduct had financial vulnerability; (iv) the conduct involved repeated actions or was an isolated incident; and (v) the harm was the result of intentional malice, trickery, or deceit, rather than mere accident.” Id.

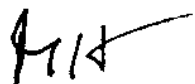
Crane continues to deny that Mr. Garvin had exposure to asbestos from Crane valves. This was a matter for the jury, whose finding that Mr. Garvin was exposed to asbestos from Crane valves was supported by the evidence. The jury was entitled to credit the evidence that Mr. Garvin was exposed to asbestos gaskets and packing supplied with Crane's new valves, as well as to replacement parts containing asbestos that Crane's design specified or required. The harm

caused was physical, and there was evidence of Crane's indifference to the risks posed by the asbestos products it widely distributed.

The jury did not base its award on harm to parties other than the Garvins, as Crane claims. The United States Supreme Court has recognized that "[e]vidence of actual harm to nonparties can help to show that the conduct that harmed the plaintiff also posed a substantial risk of harm to the general public, and so was particularly reprehensible" Philip Morris USA v. Williams, 549 U.S. 346, 355 (2007). A jury may consequently take into account harm to nonparties in determining reprehensibility. Id. at 357. A jury may not, however, go further and use a punitive damages verdict to punish a defendant for harm caused to nonparties. Id. The jury was specifically instructed that it could not punish for harm to other parties. Such risk of harm was merely a consideration for the jury in evaluating the willful and wanton nature of Crane's conduct.

Also relevant is the ratio between the compensatory damages award, which represents the plaintiff's actual or potential harm, and the punitive damages award. Mitchell, 385 S.C. at 588. "[A] court, when determining the reasonableness of a particular ratio of actual or potential harm to a punitive damages award, may consider: the likelihood that the award will deter the defendant from like conduct; whether the award is reasonably related to the harm likely to result from such conduct; and the defendant's ability to pay." Id. A single-digit ratio is generally thought to comport with due process. Id.

The legislature has capped punitive damages at three times the compensatory award. S.C. Code Ann. § 15-32-530. Such a cap is a public policy judgment that a 3:1 ratio is an inherently reasonable limit on punitive damages. The jury's award was well within this presumptively



reasonable ratio.

The Court rejects Crane's contention that punitive damages should not be permitted in asbestos litigation. Punitive damages are appropriate against an asbestos manufacturer even if there are other similar claims pending against it. See Greenville v. W.R. Grace & Co., 640 F. Supp. 559, 566 (D.S.C. 1986)(Wilkins, J.), *aff'd on other grounds*, 827 F.2d 975 (4th Cir. 1987). A manufacturer is not insulated from punitive damages simply because it may have caused widespread injury. Id. It was appropriate for the jury to award punitive damages in this case, and the award does not violate due process.

III. Ruling on Motion for New Trial Nisi Remittitur

The jury award against Crane was for \$10 million actual damages to Lloyd Garvin, \$11 million in punitive damages to Plaintiffs Lloyd and Velda Garvin, and \$1 million in compensatory damages to Plaintiff Velda Garvin. I find compelling reasons to grant a new trial nisi remittitur and reduce the jury's compensatory award to Mr. Garvin, as well as the punitive damages award.

A trial court has wide discretion to reduce an excessive verdict by granting a new trial nisi remittitur. The reduced judgment is a suggested settlement figure, which the Plaintiff may accept, or reject and request a new trial. Ruling on a new trial nisi remittitur "requires the court to consider the adequacy of the verdict in light of the evidence presented." Waring v. Johnson, 341 S.C. 248, 256, 533 S.E.2d 906, 910 (Ct. App. 2000). The touchstone for deciding whether to disturb a jury's verdict by granting a nisi motion is whether the award excessively compensates the injured party. Graham v. Whitaker, 282 S.C. 393, 321 S.E.2d 40 (1984). A famous decision by Judge Medina drives home the point: "[t]he very nature of the problem counsels restraint.



Just as the trial judge is not called upon to say whether the amount is higher than he personally would have awarded, so are we appellate judges not to decide whether we would have set aside the verdict if we were presiding at the trial, but whether the amount is so high that it would be a denial of justice to permit it to stand." Dagnello v. Long Island R. Co., 289 F.2d 797, 806 (2d Cir. 1961).

Mr. Garvin was 74 years old at the time of trial. Although he had a life expectancy of an additional 10.78 years (S.C. Code Ann. § 19-1-150), he has suffered from a number of serious medical conditions in recent years unrelated to his asbestos exposure. Dr. Holstein testified that there were several "things that might affect [Mr. Garvin's] life span" aside from his mesothelioma, including his "history of heart disease, history of adult onset diabetes, history of chronic obstructive pulmonary disease, particularly, the asthmatic component, which can get worse at times." Additionally, there was evidence that before, during, and after Mr. Garvin was diagnosed with mesothelioma and underwent his surgery, he was on a morphine pump to allay pain from prior back surgeries.

The jury was unduly liberal in awarding Mr. Garvin \$10 million in compensatory damages, and this award is excessive. This Court finds compelling reasons warrant reduction of the compensatory damages award. As set forth above, Mr. Garvin is 74 years old and suffers from several serious medical conditions wholly unrelated to his diagnosis of testicular mesothelioma and his treatment for that disease. Additionally, Mr. Garvin has been cancer-free since his surgery. Finally, Mr. Garvin's economic damages amount to \$149,000.00, and, even if a likely future reoccurrence of cancer is taken into account, those future economic damages are not expected to exceed \$150,000 to \$300,000, for a total amount of economic damages equaling



no more than \$300,000 to \$450,000. Thus, based upon Mr. Garvin's pecuniary damages, the nature of his injury, his treatments, his age, and his life expectancy, compelling reasons justify reducing his actual damages award from \$10 million to \$1.5 million.

The jury awarded Plaintiffs \$11 million in punitive damages. The jury was unduly liberal in awarding this excessive amount. Based on the compelling reasons cited above, the Court grants Crane Co.'s motion for new trial nisi remittitur as to Mr. Garvin's punitive damages award, and reduces the award from \$11 million to \$3.5 million. The court finds this amount of punitive damages, as analyzed in light of the Mitchell factors discussed above, comports with due process.

Conclusion

The Court **GRANTS** Crane Co.'s motion for new trial nisi remittitur and reduces the compensatory award to Mr. Garvin to \$1.5 million, and the punitive damages award to \$3.5 million. Mr. Garvin of course may reject the remittitur, and a new trial will be scheduled. The jury's \$1 million award to Ms. Garvin for loss of consortium shall stand, as there is no compelling reason to disturb it. Finally, Crane's motions for judgment notwithstanding the verdict and new trial absolute are DENIED.⁶

IT IS SO ORDERED.



D. Garrison Hill
Circuit Judge

November 14, 2014
Greenville, South Carolina

⁶ Within 10 days of the date of this order, Plaintiffs shall share with Crane the settlement amounts and agreements received from third parties. The court will then schedule a hearing regarding set off at either party's request.

EXHIBIT 3

ARNOLD R. BRODY, Ph.D.

1

SUPREME COURT OF THE STATE OF NEW YORK
EIGHTH JUDICIAL DISTRICT

In Re: Eighth Judicial District EIGHTH JUDICIAL
DISTRICT
Asbestos Litigation ASBESTOS LITIGATION

This document applies to:

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF ERIE

JANET E. VOELKER, as	)	Index No.
Personal Representative	)	801886/2013
of the Estate of WILLIAM	)	
R. VOELKER, Deceased, and	)	
Individually as the	)	
Surviving Spouse of	)	
WILLIAM R. VOELKER,	)	
	)	
Plaintiff,	)	
	)	
VS.	)	
	)	
ALFA LAVAL, INC., et al.,	)	
	)	
Defendants.	)	

VIDEOTAPED

ORAL DEPOSITION OF

ARNOLD R. BRODY, Ph.D.

MAY 8, 2015

VOLUME 1

ARNOLD R. BRODY, Ph.D.

2	4
1 ORAL DEPOSITION OF ARNOLD R. BRODY, Ph.D., 2 produced as a witness at the instance of the Plaintiff, 3 and duly sworn, was taken in the above-styled and 4 numbered cause on the 8th day of May, 2015, from 5 10:10 a.m. to 12:36 p.m., before Dana Taylor, CSR in and 6 for the State of Texas, reported by machine shorthand, 7 at the offices of Simon Greenstone Panatier Bartlett, 8 3232 McKinney Avenue, Suite 610, Dallas, Texas 75201, 9 pursuant to the Rules and the provisions stated on the 10 record or attached hereto. 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	1 INDEX 2 PAGE 3 4 Appearances 2 5 Stipulations -- 6 7 ARNOLD R. BRODY, Ph.D. 8 Examination by Mr. Stuemke 5 9 Examination by Mr. Pucci 80 10 Further Examination by Mr. Stuemke 100 11 Further Examination by Mr. Pucci 101 12 13 Reporter's Certificate 103 14 15 16 17 18 EXHIBITS 19 NO. DESCRIPTION PAGE 20 1 Curriculum Vitae 7 21 22 23 24 25
3	5
1 APPEARANCES 2 FOR THE PLAINTIFF: 3 MR. JAY STUEMKE 4 MS. TAERI OH 5 MR. CHARLES SOECHTING, JR. 6 SIMON GREENSTONE PANATIER BARTLETT LLP 7 3232 McKinney Avenue 8 Suite 610 9 Dallas, Texas 75204 10 jstuemke@sgplaw.com 11 toh@sgplaw.com 12 csoechting@sgplaw.com 13 AND 14 MR. JOHN P. COMERFORD (By Telephone) 15 LIPSITZ & PONTERIO, LLC 16 135 Delaware Avenue 17 Fifth Floor 18 Buffalo, New York 14202-2410 19 jpc@lipsitzponterio.com 20 FOR THE DEFENDANT JOHN CRANE, INC.: 21 MR. BENJAMIN J. PUCCI 22 O'CONNELL, TIVIN, MILLER & BURNS, L.L.C. 23 135 South LaSalle Street 24 Suite 2300 25 Chicago, Illinois 60603 bpucci@otmblaw.com FOR THE DEFENDANT WARREN PUMPS: MR. DAVID J. GOODEARL (By Telephone) LEADER & BERKON LLP 630 Third Avenue New York, New York 10017 dgoodearl@leaderberkon.com ALSO PRESENT: Mr. Mehdi Brailley, Videographer	1 PROCEEDINGS 2 THE VIDEOGRAPHER: Today's date is May 8th, 3 2015. We're on the record at 10:10 a.m. for the 4 deposition of Dr. Arnold Brody. 5 Will the court reporter please swear in the 6 witness. 7 (Witness sworn.) 8 ARNOLD R. BRODY, Ph.D., 9 having been first duly sworn, testified as follows: 10 EXAMINATION 11 BY MR. STUEMKE: 12 Q. Good morning, Dr. Brody. 13 A. Good morning. 14 Q. Can you introduce yourself to the ladies and 15 gentlemen of the jury, please? 16 A. Sure. My name is Arnold R. Brody, B-r-o-d-y. 17 I'm professor emeritus in the pathology department at 18 Tulane University Medical School. 19 Q. Okay. And this dep- -- this trial is scheduled 20 to occur the week of June 8th, and I'd asked you if you 21 could appear at trial on June the 10th; is that right? 22 A. Right. 23 Q. And what are you going to be doing on 24 June 10th? 25 A. Well, there's an annual conference called the

2 (Pages 2 to 5)

6 1 Aspen Lung Conference. I've been attending that 2 conference since the '70s, and now I'm on the board of 3 that conference. And I try to attend every year, when 4 possible. And this year I'm going to be there, so I 5 will not be available for trial. 6 Q. Okay. And so for that reason, you've agreed to 7 appear today by deposition to give us the testimony that 8 you would have provided at trial; is that right? 9 A. That's right. 10 Q. Okay. Are you a medical doctor, sir? 11 A. No. I'm a Ph.D. 12 Q. Okay. And what teaching responsibilities have 13 you had in your career? 14 A. Uh-huh. Well, starting in the '70s, I was an 15 assistant professor in the medical school at the 16 University of Vermont. And then I had adjunct positions 17 at Duke University and University of North Carolina. 18 And then I was a professor, a full professor, at 19 Tulane University. 20 And during all those times, I was teaching, 21 giving lectures in the medical school, and to medical 22 students, graduate students, and undergraduates as well. 23 Q. Now, how is it that a Ph.D. can teach medical 24 students that will become M.D.s? 25 A. Right. So -- so that's not at all unusual,	8 1 Q. Okay. And we've marked that, for today's 2 purposes, as Deposition Exhibit 1. This will be a trial 3 exhibit that the jury will be able to review later. 4 Doctor, using your CV, can you describe for us 5 your educational background? 6 A. Sure. After high school in New Hampshire, I 7 went out to Colorado to do a bachelor of science degree 8 in zoology. That's the study of animals. 9 Then went to the University of Illinois where I 10 received a master of science degree in anatomy. Anatomy 11 is where we learn how our parts fit together and 12 function. And that was animal anatomy, human anatomy, 13 muscles, bones, nerves, skeletal structure, those -- 14 those kinds of things and how they function. 15 Then I went back to Colorado to do a Ph.D. 16 That's the Ph.D. we talked about earlier. That was in 17 cell biology. Every living thing is made of cells. We 18 need to understand how cells function. Every disease 19 has a target cell from which that disease develops. 20 My focus has been on lung cells and lung cell 21 biology, but every tissue and organ system has different 22 cells and different -- and cell biologists focus on 23 whatever cell type they've -- they've chosen. 24 I also -- on my CV, it also says, cell biology 25 and ultrastructural cytology. That's the big word for
7 1 actually. You go to any medical school, anywhere in 2 this country and -- and around the world, and there are 3 Ph.D.s, like myself, who teach the basic medical 4 sciences to the students. 5 Things they need to understand before they go 6 into their clinical work, like -- things like 7 biochemistry, molecular biology, anatomy, embryology, 8 those kinds of things that the students need to learn, 9 and those are typically taught by Ph.D.s. 10 They're taught by M.D.s as well, but typically, 11 in medical school, it's taught by Ph.D.s. 12 Q. Okay. And what is your specialty? 13 A. My specialty is lung pathology. 14 Q. What does lung pathology mean? 15 A. So lungs, obviously, and the chest cavity, and 16 pathology's the study of disease. So it's -- it's 17 actually broader than that. It's -- it's -- it's 18 pathobiology, which is the biology of disease. 19 (Exhibit 1 marked.) 20 Q. (By Mr. Stuemke) Okay. And I want to talk 21 with you about your educational background and your 22 professional background. I'm handing you a document. 23 Can you tell us what that is, please? 24 A. Sure. This is my CV or curriculum vitae or 25 resume.	9 1 studying cells with an electron microscope. That's -- 2 ultrastructural means at the level of electron 3 microscopy. 4 Q. Okay. 5 A. After the Ph.D., I did three years of 6 postdoctoral study at Ohio State University, and then 7 started my academic career. 8 Q. Okay. And how did you start your academic 9 career? 10 A. You mean where, or how did it happen that I got 11 a job? 12 Q. Well, where did you start it? 13 A. Yeah. So I -- I was offered a position as an 14 assistant professor -- that's a beginning professor -- 15 at the University of Vermont in the medical school, in 16 the pathology department in the medical school there. 17 And I was there for six years. 18 Q. Okay. And what did you start off studying when 19 you got to the University of Vermont? 20 A. It was a disease called lung fibrosis, which is 21 scarring of the lung. 22 Q. Okay. And did your early work there, at the 23 University of Vermont with some of those professors, 24 influence the path that your career has taken? 25 A. Oh, yeah, no question. I mean, so I started

10 1 there in 1972. In 1974, we had a visitor to the 2 department. His name was Dr. Wagner. It's W-a-g-n-e-r. 3 It looks like Wagner, but he's from South Africa. He 4 pronounces his name Wagner. 5 Dr. Wagner, in 1960, had established that 6 asbestos, which I'm sure we'll hear more about -- 7 asbestos causes this cancer called mesothelioma. 8 Dr. Wagner was visiting the department. He saw 9 the work that I was doing using electron microscopy, and 10 he asked me if I'd be interested in coming to work with 11 him in Wales. He was -- he had moved from South Africa 12 to Wales in the United Kingdom. And I was, of course, 13 thrilled to do that, to have that opportunity, and took 14 my own family. 15 And we studied -- I studied with Dr. Wagner for 16 a couple of months and learned the model systems that he 17 was using to understand how asbestos causes disease. 18 And that really set my -- the path for my research over 19 the next decades. 20 Q. Okay. Now, tell us something about the model 21 systems you refer to that Dr. Wagner used to study 22 asbestos and disease. 23 A. Right. So -- so take any human disease -- I 24 mean, just pick one. I mean, diabetes, HIV, cancers, 25 tuberculosis, a whole variety of different human	12 1 That's one of the national institutes of health. There 2 are 25 different institutes. The most recent one was 3 the National Human Genome Institute. 4 And those are government laboratories, which 5 are supported by the federal government to understand 6 human disease where there are insufficient treatments or 7 cures. I mean, today there are no effective treatments 8 for any of the asbestos-related diseases. 9 So the institute that I was at, which is the 10 National Institute of Environmental Health Sciences, is 11 obviously involved in understanding how agents in the 12 environment, like asbestos and other toxic agents, cause 13 disease. 14 So I was offered a position there. I moved up 15 to head of the lung pathology laboratory at the -- we 16 call it the NIEHS, the Institute of Environmental Health 17 Sciences. And I carried out a long series of basic 18 science research papers for 15 years. 19 Q. Okay. And while you were doing that, were you 20 also pursuing your academic career as a professor? 21 A. Right. So I had adjunct positions at 22 Duke University and at University of North Carolina and 23 North Carolina State University. That means I could 24 have students from the medical schools in my laboratory. 25 I could have graduate students, medical students working
11 1 diseases. Scientists have developed what we call animal 2 models. In other words, you can use rats or mice or 3 guinea pigs or other animals that develop the same 4 disease as people. 5 And if, in fact, they develop the same disease, 6 and the disease comes from the same cells as the -- as 7 humans and has the same causes as the human disease, 8 then you can understand components of the human disease. 9 You can't understand everything you want to know about 10 human disease by using animals. But if you ask the 11 right questions and you have a good model, then there's 12 a lot you can learn. 13 Dr. Wagner, for example, exposed rats to 14 asbestos, all the different asbestos variety. And he 15 found that the animals get asbestosis, which is scarring 16 in the lung. They get lung cancer, and they get this 17 cancer mesothelioma from exposure to asbestos. 18 Now, that means that there's -- this is a model 19 system, and I was able to take that into my laboratory 20 and use it for years. 21 Q. Okay. And after you studied with Dr. Wagner, 22 how did your career progress? 23 A. So I -- as I said, I was at the University of 24 Vermont for six years. Then I was offered a position at 25 the National Institute of Environmental Health Sciences.	13 1 with me, and that -- that worked out very nicely over 2 the years. 3 Q. Okay. And your resume indicates that you 4 became a full professor in the department of pathology 5 and department of environmental health sciences at 6 Tulane; is that right? 7 A. Right. So in 1993, after 15 years at the 8 government laboratory, Tulane University, which is in 9 New Orleans, offered me a position as a full tenured 10 professor, based on my previous work that I had done. 11 And they offered me that position to teach at the 12 university and continue my basic science research on 13 asbestos disease. 14 In 1999, I was promoted to vice chairman of the 15 pathology department in the medical school and was there 16 right through Hurricane Katrina really, right through 17 2005, 2006. And during that time, I continued 18 publishing my work, and I was supported throughout that 19 time by the National Institutes of Health through 20 competitive grants. 21 Q. Okay. And you've mentioned several times 22 the -- the work you've done on asbestos and disease 23 and -- and the publications you've made. 24 How much of your work on asbestos disease has 25 actually been funded by the National Institutes of

14 1 Health? 2 A. Well, really -- all of it really. I mean, I 3 have no -- really have no other sources. I had a couple 4 of small grants from pharmaceutical companies, but -- 5 but through the years, my work's been funded by what are 6 called competitive grants. 7 So if every -- I've been competing with medical 8 students -- medical schools -- I'm sorry -- medical 9 schools across the country. Professors in medical 10 schools apply for support by the National Institutes of 11 Health. We write proposals. We put down what are our 12 best ideas and ask for support to carry out the 13 experiments to -- to bring these research ideas to 14 fruition. The top 10 to 15 percent of those 15 applications get funded. 16 So of the tens of thousands of applications 17 that come in from New York and California and Texas and 18 Florida and everywhere across the country, those all go 19 into the National Institutes of Health and about 20 10 to 15 percent of those are funded. 21 So it's a very competitive environment. And my 22 work has been funded, without interruption, by this 23 process through the years. 24 Q. Okay. And you mentioned publication. How do 25 you report the results of your findings, and how does	16 1 They then write reports back to the editor, and 2 they may ask for additional experiments. They may ask 3 for clarification of some of the writing. They may say, 4 it's fine. It's ready to go. It's unlikely but -- that 5 they'd say that, but -- but there are all different 6 levels of -- of requests that can be made. 7 The editor communicates those issues with me. 8 I can revise the paper. I can do additional 9 experiments; clarify the writing. When the editor is 10 satisfied and I'm satisfied and the reviewers are 11 satisfied, then the paper can appear as a peer-reviewed 12 paper. 13 Q. Okay. And approximately how many peer-reviewed 14 papers have you published in the scientific literature? 15 A. Uh-huh. I have 153. They're all listed on my 16 CV. 17 Q. Okay. And I took a look, and it looks like 18 that extends from Page 12 to 23 of your CV. We're not 19 going to talk about every one of those articles, but 20 we're going to give the jury an understanding about how 21 many of those 153 peer-reviewed articles deal with 22 asbestos and how asbestos causes disease. 23 A. Uh-huh. So whether it's 110 or 120, I'm not 24 sure, but it's -- most of them, the great majority of 25 them, deal with asbestos disease. The other papers deal
15 1 that get into the scientific knowledge base? 2 A. Well, this is essential. First of all, in 3 order to be able to compete for these grants, you have 4 to be able to publish what you do. You have to make 5 what you do available in the open medical literature so 6 that anyone who's interested can -- can see what you're 7 doing. 8 The way that's done is by developing what are 9 called peer-reviewed publications. In other words, 10 these are publications that are reviewed by my peers, 11 other scientists like myself. So in order to do that, 12 when I carry out a series of experiments and I think the 13 results are ready, that I want the results to be out 14 there, I write a paper. 15 I write a manuscript with an introduction. I 16 describe the methods that I used. Excuse me. I have a 17 results section. And then I have a discussion section 18 of the paper where I write -- put what I've done in 19 perspective to what other scientists have done. 20 I send that to anyone of -- could be 20 or so 21 different scientific journals. You can only send it to 22 one at a time. I'm just saying it could be one of 20 or 23 so different journals. And the editor of that journal 24 sends my work to two or three or four of my peers, who 25 anonymously review my work.	17 1 with lung cells, lung cell biology, viral diseases. I 2 wrote a paper with some colleagues in 2012 on asthma, 3 for example. 4 Q. And you mentioned the Aspen Lung Conference 5 that you're going to be attending during the trial of 6 this case. How common is it for you to attend 7 conferences that relate to lung disease? 8 A. Oh, regularly. I mean, during the height of my 9 career, I mean, I should probably just finish the 10 process just to put it in perspective because, after 11 Tulane, Hurricane Katrina kind of closed things down for 12 a long time. 13 And so we moved to North Carolina, and I 14 accepted a position as a professor of molecular biology, 15 molecular cell biology at -- at North Carolina State 16 University and finished the last five years of my career 17 at North Carolina State. I retired in 2011. And in 18 2012, I was named professor emeritus there. 19 Q. Okay. 20 A. And -- and so -- so then your -- your question 21 of -- ask me your last question again to make sure I get 22 it. 23 Q. My last question was about the conferences that 24 you attend that relate to lung disease. 25 A. Right. So -- so through the time that I was

18	1 professor in the medical schools and was at the National 2 Institutes of Health, I probably went -- was invited to 3 three or four different conferences a year. Many of 4 them in -- in various countries around the world. Now I 5 do maybe one or two conferences a year. 6 Q. Okay. And this title, professor emeritus, at 7 Tulane University, what does that mean? 8 A. So emeritus is from the Latin out of merit. It 9 is a position that I was honored with by the faculty and 10 administration at Tulane University for the work that I 11 had done there as a professor. 12 One is offered the opportunity to present 13 their -- present their qualifications to a presidential 14 committee, essentially, that -- that reviews the 15 qualifications. And if they think that you're worthy of 16 that, you're offered this academic status for life. 17 No -- no pay. 18 Just a -- an honorary position, but it -- it -- 19 it allows me to continue my work with colleagues at 20 Tulane, which I'm currently doing. I mean, these are 21 faculty members that I hired who have now received their 22 own tenure and their own grants, and I'm continuing to 23 work with them and -- and publish work together. 24 Q. Okay. We've talked about your publications in 25 scientific journals. Have you ever served on a board of	20	1 conference, and the substance of that talk is published, 2 it's called a proceedings, and so that would also be in 3 this section. 4 So these are not peer reviewed, but all of the 5 ones that I have here are invited, and they are -- they 6 all relate to asbestos disease. 7 Q. Okay. Is it fair to say, Doctor, that you've 8 been on the cutting edge of research into how asbestos 9 causes disease for approximately 40 years? 10 A. That's what I've been doing, right. 11 Q. All right. You mentioned earlier Dr. Wagner 12 having established that asbestos exposure caused 13 mesothelioma in 1960? 14 A. Right. 15 Q. If -- if it's been understood since 1960 that 16 asbestos causes this disease, why have you been 17 researching it for 40 years? 18 A. Yeah. Well, I mentioned that -- that there are 19 no effective treatments for any of the asbestos-related 20 diseases. So the idea of basic science research is to 21 understand the disease sufficiently to develop effective 22 treatments and cures. 23 And, I mean, you could say that about many 24 different diseases, including all of the ones that are 25 caused by asbestos. We -- we don't understand
19	1 editors of any journals? 2 A. I do that regularly. I still do, sure. 3 Q. Okay. And what are some of the journals that 4 you've done that on? 5 A. Well, I -- I sit on the American -- the 6 editorial board of the American Journal of Pathology, 7 Journal of Inflammopharmacology. I've been on the 8 editorial board of the American Journal of Physiology 9 and American Journal of Respiratory, Cell, and Molecular 10 Biology. 11 Q. Okay. And have you also served as a peer 12 reviewer in the publication process? 13 A. For a large number of journals, and I -- and I 14 do that regularly too. 15 Q. Have you written any books or chapters in books 16 that relate to asbestos and asbestos disease? 17 A. Right. So there's a section -- after the 18 peer-reviewed section, there is a section in my CV 19 called, invited reviews and chapters and things like 20 that. This is where I might be invited to write a 21 chapter for a book, for example. 22 If somebody's writing a book on asbestos -- I'm 23 sorry. If somebody's writing a book on toxicology, and 24 they want me to write a chapter on asbestos, I've done 25 that a number of times. Or if I give a talk at a	21	1 sufficiently the -- the fundamental nature of the 2 disease process to be able to block it. 3 Q. Okay. Doctor, this is not the first case in 4 which you've provided testimony; is that right? 5 A. No. Of course, I've testified many times. 6 Q. All right. In fact, you've testified for me 7 and for my law firm a number -- a number of occasions; 8 is that right? 9 A. Sure, I have. 10 Q. Have you ever been asked to testify by a 11 defendant in this case John Crane? 12 A. I have, yes. 13 Q. Okay. And have you also testified for other 14 companies involved in asbestos litigation? 15 A. I have, sure. 16 Q. How does the testimony that you're going to be 17 offering this jury today relate to the testimony that 18 you offered on behalf of John Crane and other companies 19 involved in asbestos litigation? 20 A. Yeah, it -- it doesn't differ at all. I mean, 21 the -- the concept that I was asked to present by 22 John Crane was how asbestos causes disease, and that's 23 exactly what I did. That's what you've asked me to do 24 here today, and that's what I expect to do. 25 Q. Okay. Does your testimony change at all

22 1 depending on who's asking you to provide it? 2 A. Of course not. 3 Q. All right. Now, you bill us for your time; 4 correct? 5 A. Sure. 6 Q. What is your hourly rate? 7 A. \$550 per hour. 8 Q. Okay. 9 MR. STUEMKE: For the record, at this time 10 the plaintiffs would tender Dr. Brody as an expert in 11 cell biology, experimental pathology, asbestos disease, 12 and the mechanisms by which asbestos causes disease. 13 Q. (By Mr. Stuemke) Dr. Brody, I'll be asking you 14 about a number of opinions in this case. Will you agree 15 that any opinions you offer today will be only those you 16 hold to a reasonable degree of scientific certainty? 17 A. Sure. 18 Q. Doctor, there are three main topics I'd like to 19 address with you today. The first is how asbestos 20 causes disease and the diseases it causes. Next is 21 which asbestos fibers cause mesothelioma. And, finally, 22 is there a safe level of exposure to asbestos. 23 Are you prepared to discuss all of those issues 24 today? 25 A. I am.	24 1 Q. (By Mr. Stuemke) Dr. Brody, we took a short 2 break so we could get things set up for a presentation 3 here on the screen; is that correct? 4 A. Right. 5 Q. What are we looking at here in our first slide? 6 A. Yeah. So I have a diagram here. Obviously, 7 it's a diagram. You know where your lungs are, but I 8 just want to remind you that, when you take a breath, 9 the air comes down this tube that we call the trachea or 10 windpipe, and the air then goes down this series of 11 tubes that are called conducting airways because they 12 conduct air down into the lungs. 13 The -- this diagram can also be used as a map 14 to show you where the different asbestos diseases 15 develop. So, for example, in the walls of the airways 16 can develop the disease called lung cancer. Lung cancer 17 typically is associate with cigarette smoking, but 18 asbestos alone causes lung cancer and, particularly, if 19 a smoker is exposed to asbestos, it makes it even more 20 likely that a lung cancer will develop. 21 Out in the gas exchange area of the lung, it 22 can develop the disease asbestosis. Asbestosis is scar 23 tissue in the lung from inhaling asbestos. That's 24 typically high levels of exposure for long periods of 25 time produce the disease asbestosis.
23 1 Q. Okay. And, Doctor, first, with respect to how 2 asbestos causes disease, have you prepared any materials 3 that would help you to explain these concepts to a jury? 4 A. Well, I typically use a set of slides. Most of 5 these are pictures that I've taken with various kinds of 6 microscopes. They are slides that I use when I teach 7 the medical students. 8 They're -- many of these slides I use when I've 9 given talks at various universities across the country 10 and around the world. I mean, these are the slides that 11 I use to go through the basic concepts of how asbestos 12 causes disease. 13 Q. Okay. And, Dr. Brody, I'm going to ask you to 14 step up and use the screen and the presentation and -- 15 and show the jury some of these slides while I ask you 16 questions. 17 Is that Okay? 18 A. Sure. 19 Q. All right. 20 MR. STUEMKE: Let's take a short break. 21 THE VIDEOGRAPHER: Take a short break. 22 We're off the record at 10:34 a.m. 23 (Break from 10:34 to 10:45.) 24 THE VIDEOGRAPHER: This is the continuation 25 of tape one. Back on the record at 10:45 a.m.	25 1 Now, this black line that runs around the 2 outside of the lung that represents the pleura, 3 p-l-e-u-r-a. The pleura is a very thin membrane. I 4 mean, Saran wrap thin membrane. It wraps around the 5 outside of the lungs, makes the lungs airtight like 6 balloons. 7 Along the outside of the pleura, whether it's 8 the pleura that runs around the outside of the lung or 9 the inside of the chest wall, that pleura is lined by 10 cells called mesothelial cells. Single layer of cells 11 called mesothelial cells. And if somebody has a cancer 12 of the mesothelial cells, it's called mesothelioma. 13 Q. Okay. 14 A. So diagrams are very useful. I use diagrams 15 all the time, but it helps to be able to see what these 16 things actually look like. And so in that case, I use 17 what's called an electron microscope. 18 Q. Okay. And is this a younger, fitter version of 19 Dr. Brody that we see here? 20 A. Yeah. I don't know if he was fitter, but he 21 certainly -- he was certainly younger. 22 Right. So, yes, this is a microscope that I 23 had for many years. They -- actually, this microscope 24 was a victim of Hurricane Katrina. I can take a piece 25 of tissue as small as a period at the end of a sentence

26 1 or as big as this device I have in my hand and put that 2 tissue into this door right here in front of me and 3 enter the tissue into a vacuum in this column. 4 So the column is evacuated. The tissue is 5 placed into the vacuum, and at the top of the chamber is 6 an electron gun. So it generates electrons. The 7 electrons pass down through the column and strike the 8 sample that I put in there. The electrons then pass 9 over the sample; recreate the surface of that sample at 10 the microscopic level. 11 I then collect those electrons with the 12 electron that's here. The image is then produced on 13 this screen right in front of me. And then just off of 14 the screen is a camera so I can take a permanent image 15 of whatever it is I'm looking at. 16 So, for example, if I cut a piece of tissue out 17 of the lung here, and you'll see the pleura running over 18 the top, and you see the conducting airways running up 19 into the lung. And I cut this tissue out. I put it 20 into the microscope, and I take a picture of it, it 21 looks like this. 22 And you can see that the lung -- you can see 23 the conducting airways in the lung. You can see the 24 very thin pleura that runs around the outside of the 25 lung. On the surface of the pleura are where the	28 1 But they typically don't make us sick because 2 we have very good defense mechanisms, and those defense 3 mechanisms start with the nose hairs that we have, the 4 moisture in the back of our throats trap particles. 5 Some of those particles get down into these -- into the 6 airways. And I want to show you that we have a very 7 effective defense mechanism in the airways. 8 So I'm going to focus the microscope down on 9 the surface of this airway. I'm going to fill the 10 screen with what's in this red spot that I've made from 11 my pointer here, and you'll see what the surface of our 12 airways looks like. 13 So I focus the microscope, I take a picture, 14 and I fill the screen with what's in that, and this is 15 what the surface of our lungs looks like. You can see 16 this says human bronchial, or small airway is a 17 bronchial. 18 Q. What do we see on the surface here of the 19 bronchial, Doctor? 20 A. Uh-huh, right. So you see these little -- 21 these look like little hairs, but actually they're not 22 hairs at all. They're -- they're extensions of the cell 23 surface, and they're called cilia, c-i-l-i-a. 24 And these cilia are constantly beating in a 25 wave-like synchronous fashion. So that if something
27 1 mesothelial cells are located. And here you can see a 2 few of the hundreds of millions of air spaces that make 3 up our gas exchange air of the lung where we exchange 4 oxygen and carbon dioxide. 5 So you take a breath, the air comes up the 6 airways and fills the air spaces. And I'll show you 7 where -- that's where we exchange oxygen and carbon 8 dioxide. 9 Q. And how does this help us understand how 10 asbestos gets into the lung? 11 A. Yeah. Well, we're -- we're talking about a 12 mesothelioma, which occurs out here in the periphery of 13 the lung at the pleura. 14 And what I want to show you is where the fibers 15 land and how they get out there. And then when I show 16 you how they get there, then I'll explain how the 17 asbestos interacts with the -- with the cells to produce 18 a cancer. 19 Q. Okay. 20 A. All right. So first thing is we have a series 21 of defense mechanisms which protect us. I mean, as we 22 walk around all day, we're exposed to a variety of 23 different things that could make us sick, like bacteria 24 and pollen grains and silica particles and asbestos, all 25 things in the environment.	29 1 lands on the surface of our cilia, it gets swept up to 2 our mouth, and we swallow it or spit it out. And that's 3 going on in all of us all the time. 4 And you can see that these cells have cilia, 5 but not all the cells have cilia. Some of the cells are 6 naked on the top, and those cells make mucus. That's a 7 very important part of our airways. 8 The mucus and the cilia combine to form a very 9 important defense mechanism that we call the muco- -- 10 mucus -- -ciliary escalator because it escalates things 11 up to our mouth. So it's constantly working as a very 12 effective defense mechanism. Something lands in our 13 airways, gets swept up to our mouth, and we swallow it 14 or spit it out. 15 Now, this is a human bronchial, and I'm telling 16 you that this is how our airways work. But I want you 17 to understand that this is the same function, same cells 18 whether it's humans or rats or cats or guinea pigs or 19 dogs or monkeys or horses and giraffes. We all have 20 these very same mechanisms that protect our airways. 21 Q. Okay. 22 A. Now, down in the lower right-hand corner is 23 what's called a size marker. The microscope prints a 24 marker on there for us so that we know how big and small 25 these things are all the time.

30 1 This says 10 with a little sign that means 2 microns. So it's easy to see 10 microns. Now, it's 3 easy to see 10 microns because I magnified this tens of 4 thousands of times. 5 Let me explain how big a micron is. 6 Q. Please. 7 A. Okay. So if you take your thumb and your 8 forefinger and you make a little space, you can just 9 barely see with your naked eye through that space, 10 you've made a millimeter. So the human eye can see just 11 about a millimeter. 12 If you take that millimeter now and divide it 13 1,000 times, you've made 1,000 microns. So the human 14 eye can resolve 1,000 microns. You obviously can't see 15 10. You can't see 100. You can't see 500. But when 16 it's magnified, it's easy to see 10 microns. 17 And if you want to know how long these cilia 18 are, you stand this bar up in your mind's eye, and you 19 can see that these cilia are about 8- to 10-microns 20 long. And when we look at asbestos, we're going to 21 know -- want to know how long or wide those fibers are, 22 and you'll be able to know that by looking at the size 23 marker that's printed on the pictures. 24 Okay. So now a lot of fibers, of course, are 25 trapped in your nose. So the point is that, whenever	32 1 A. Oh, they do, and -- and I'm going to show you 2 that. 3 Q. Okay. 4 A. Let's take a look at that area. Before we look 5 at asbestos, we'll see that -- that area. So we're 6 going to go to the end of the airway where it opens out 7 into the gas exchange. That's this area here, the end 8 of the airway, opens out into the gas exchange. 9 And -- and here you can see a few of the 10 hundreds of millions of air spaces that fill our lungs. 11 There are some holes in the walls of these air spaces. 12 And those holes in the walls is where the blood runs. 13 All the blood in our bodies has to go through our lungs 14 because that's where we pick up the oxygen and give off 15 the carbon dioxide. 16 Now, I'm going to take us into a single human 17 air space. But before I do that, I want you to 18 understand what's lining all of these air spaces because 19 that turns out -- as we discovered in my laboratory, 20 that turns out to be a passageway for asbestos to get to 21 the pleura. 22 So if I look at the floor in this room, there 23 are some carpet squares. If you think of every carpet 24 square on this floor as a cell, you have a concept of 25 what the floor of our air spaces looks like. And if you
31 1 there's asbestos in the environment and somebody's 2 inhaling the asbestos, some proportion of the fibers get 3 stuck in the nose and some in the back of the throat, 4 and some go down onto the escalator and get caught and 5 brought up to the mouth, and some go right past the 6 escalator and land down in the gas exchange area of the 7 lung. And that's where we're going to go next. 8 Q. Okay. So what we've been looking at is what's 9 in the airways; is that correct? 10 A. That's right. 11 Q. And what is the gas exchange area of the lung 12 exactly? 13 A. Yeah. Well, we need oxygen in our brains, in 14 our muscles, in our -- in order to function. And the 15 way we get that oxygen is by inhaling the room air, 16 which has about 20 percent oxygen in it. 17 The oxygen fills the air spaces, and we extract 18 the oxygen from the room air in these small air spaces. 19 And the oxygen passes into the blood, and the blood then 20 carries the oxygen all around the body, picks up the 21 carbon dioxide that -- that is developed when you use 22 the oxygen. And when that gets back to the lung, you 23 exhale. 24 Q. Is it possible for asbestos fibers to make 25 their way all the way to the gas exchange area?	33 1 think about this courtroom net we're in, you get a -- an 2 idea of what the room might be. 3 You take the ceiling off. You see we're 4 surrounded by walls, and there's a carpet on the floor. 5 The carpet goes up over the wall, into the next air 6 space. Continuous carpet covering for all of our 7 hundreds of millions of air spaces. 8 And that's a particular kind of cell that makes 9 up this carpet. It's called epithelial cells. 10 Epithelial cells cover surfaces. Your skin, actually, 11 is an epithelium. We call it epidermis. 12 Now, you take a closer look now at one of these 13 air spaces, and we'll see what the carpet looks like in 14 a normal human air space. So I'm going to focus the 15 microscope right down in a single air space -- single 16 human air space; could be any one of these. And I focus 17 the microscope down, and I take a picture of the carpet. 18 So here's a single human air space, and I'm 19 outlining, for you here, one of the carpet squares, 20 except that nature doesn't make squares very well. 21 Nature makes smooth surfaces. So this is sort of a 22 carpet oval, and then there's another oddly shaped 23 carpet cell here, and another one here. 24 And then there are these sort of round cells 25 with little bumps all over them, and those little round

34 1 cells are another kind of epithelial cell, such that if 2 the big flat carpet cells get injured, these smaller 3 cells actually start to divide and take their place. 4 So every one of us -- us meaning you and me and 5 dogs and cats and rats and guinea pigs -- all have this 6 repair mechanism on the carpet of our air spaces. Now, 7 we found out that, when asbestos injures these carpet 8 cells, these smaller cells rapidly start to grow and 9 repair the injury from the asbestos. 10 Okay. One more line of defense. So we're 11 going to take the microscope down and look at the cell 12 with the pumps on it. We're going to look at this area 13 right in front of that cell. I'm going to focus the 14 microscope right here, and here's the cell now with the 15 bumps all over it. As you can see, here's the carpet 16 down here. 17 But now there are two other actors. There's 18 this cell sitting here, and then there's this cell with 19 a tail end. And then the cell has these false feet out 20 in front of it. So I caught the cell moving in this 21 direction, as it was going after this pollen grain right 22 here. 23 So these cells -- this one kind of ruffled and 24 then this one that was moving -- those cells are called 25 macrophages. Macro means big, and phage means eater.	36 1 couple of hours after death. And I was going from air 2 space to air space with my microscope looking for 3 interesting things to show the medical students, and I 4 came upon these two macrophages. 5 This one, in the process of going after this 6 pollen grain, it was going to take the pollen grain into 7 the structure of the cell, digest it, break it down, not 8 for nutritional purposes, of course, but to rid it from 9 the surface. That the cells then would crawl up -- the 10 cells then crawl up onto the escalator. 11 And every time you swallow, you swallow a few 12 of your friends, these macrophages that are constantly 13 clearing air space surfaces of things like pollen and 14 asbestos and bacteria or whatever else may land on this 15 surface. But these cells have chemical signals -- can 16 detect chemical signals from foreign agents, and that's 17 how they find these things. 18 Q. Okay. 19 A. Okay. So we've seen all of the cells we need 20 to see to understand what happens when asbestos gets 21 into the lungs, so we can talk about asbestos. 22 Q. Okay. Doctor -- 23 A. Uh-huh. 24 Q. -- you will probably be the first expert 25 witness that the jury hears from in the case. From a
35 1 These cells are the big eaters of the lung, and they 2 patrol our air space surfaces. 3 Every one of us has macrophages that can detect 4 the presence of foreign particles in our lungs. If you 5 don't smoke, you have about anywhere from one to three 6 of them in every one of your air spaces. If you do 7 smoke cigarettes, you can have hundreds of them in the 8 air spaces trying to clean up the mess from the 9 cigarette smoke. 10 But these cells are very important in keeping 11 the carpet and the air space surfaces clear. And they 12 respond to the presence of asbestos. Because asbestos 13 is a toxic agent -- all -- all the asbestos varieties 14 are toxic, and we don't want any fibers sitting on our 15 air space surfaces. And I'll show you how the cells 16 respond to that. 17 Q. How do they know to respond to asbestos? 18 A. Well, we actually discovered the chemical 19 signal that attracts them. I mean, this macrophage was 20 going after this pollen grain. This -- this lung once 21 belonged to somebody who was killed in a motorcycle 22 accident. 23 I was on the medical examiner's autopsy call, 24 and I went in to prepare his lung so that I could look 25 at it in as life-like a situation as possible after -- a	37 1 scientific prospective, can you describe for the jury 2 what asbestos is and where it comes from? 3 A. Yeah, sure. So -- so asbestos is a naturally 4 occurring mineral. It's mined from the soil, and it's 5 been mined in many different continents: in the U.S. 6 and in South American and Brazil and Russia and 7 Australia. It's been mined in many different places. 8 There are two different mineral groups that are 9 called asbestos. One of them is called amphibole, 10 a-m-p-h-i-b-o-l-e. Amphibole asbestos has two 11 commercially useful varieties called crocidolite, 12 c-r-o-c-i-d-o-l-i-t-e, and amosite, a-m-o-s-i-t-e. 13 Those two mineral groups, amosite and crocidolite, make 14 up about 5 percent of all the asbestos that's ever been 15 used. 16 The other mineral group called serpentine has 17 an asbestos in that group called chrysotile, 18 c-h-r-y-s-o-t-i-l-e, and that's what I'm showing up here 19 is chrysotile. Chrysotile makes about 95 percent of all 20 the world's use. And so with those three commercial 21 varieties, you have about -- you have close to 22 100 percent of what's ever been used in the world. 23 All of the asbestos varieties cause all of the 24 asbestos diseases: asbestosis, lung cancer, 25 mesothelioma.

38 1 Q. Okay. 2 A. And they do so by essentially the same 3 mechanisms, which I'm going to talk about now. 4 Q. Okay. And, Doctor, there's a couple -- there's 5 one other type of asbestos fiber that the jury may hear 6 about in this case, and that is called tremolite. 7 Are you familiar with tremolite? 8 A. Oh, sure. 9 Q. What is tremolite? 10 A. So tremolite is one of those amphiboles I told 11 you. It's in the same family as crocidolite and 12 amosite. It's just, to my knowledge, not been typically 13 used commercially; although, you can find it in its own 14 mineral deposits. And it can also be found along with 15 chrysotile. 16 Q. Are you familiar with studies showing that 17 tremolite sometimes contaminates -- contaminates 18 chrysotile? 19 A. Yeah, and, you know, contaminate means it 20 doesn't belong there. But, in fact, it's naturally 21 occurring along with chrysotile and is mined at the same 22 time that chrysotile is in some places. 23 Q. Okay. Thank you, Doctor. 24 A. Yeah, sure. 25 Okay. So I'm going to talk to you about where	40 1 What we wanted to do was to start the process, 2 to understand control of cell growth, which, as I'll 3 explain, is -- is a crucial part of development of 4 cancer, and so that's where the focus of our research 5 has been. 6 Q. So you said it had already been done. You mean 7 that animal studies had already shown that chrysotile 8 causes mesothelioma? 9 A. Right. And, of course, the epidemiology does 10 the same thing. Epidemiology, the study of populations, 11 shows that chrysotile and all the other asbestos 12 varieties cause mesothelioma. 13 So I didn't have to produce a mesothelioma in 14 the laboratory. What I had to do was start the process 15 and understand the -- the mechanisms of that disease. 16 Q. Okay. And are you ready to explain to us the 17 mechanisms of that disease? 18 A. Right. 19 Q. Okay. Let's do so. 20 A. So -- so the first thing is to make an aerosol 21 of the asbestos so the animals inhale it. And when we 22 started our studies, if somebody had asked me, where did 23 the asbestos fibers land in the lung, now you can see 24 the lung is a very complex organ. 25 I mean, it has a number of different cell
39 1 asbestos goes in the lung and how it causes cancer. I 2 typically use chrysotile because it's the most used, but 3 I've used crocidolite and amosite as well. I have a 4 picture of crocidolite I'll show you also. 5 But as I say, I typically use chrysotile. And 6 what we've done a number of different kinds of 7 experiments. One kind of experiment we did is to 8 take -- is to use what are called exposure chambers. 9 So these are chambers about 6-feet high, 4-feet 10 wide that Dr. Wagner had developed and showed that, if 11 you expose animals to asbestos over their life span, 12 they get asbestosis, lung cancer, and mesothelioma, just 13 like people do. And only a small percentage of them get 14 mesothelioma, just like people. 15 In other words, it -- it's a very rare disease. 16 Most people, no matter how much they're exposed to it, 17 do not get mesothelioma. And it's the same with the 18 animal models. You can expose them through their 19 life span and only a small percentage get mesothelioma. 20 In fact, in my laboratory, we decided that we 21 were not going to try to produce clinical mesotheliomas 22 in the animals because, number one, it had already been 23 done by Dr. Wagner and other scientists, and it takes a 24 long time. It takes years to expose them and -- and to 25 get only a few tumors.	41 1 types. It has a lot of spaces in it. It's very -- it 2 has a lot of structure to it. So where does the 3 asbestos go in the lung. It -- of course, it goes in 4 the lung, but where in the lung does it go. Nobody 5 could answer that question. We -- we didn't know the 6 answer to that question. 7 So I started a series of studies, and I'm going 8 to answer that question. And then I'll show you where 9 the asbestos goes and how it gets to the pleura. 10 Q. Okay. 11 A. So -- so we made an aerosol of this asbestos, 12 and you can see -- let's look at the size first. 13 There's a size marker down here. This is 1 micron. 14 And, remember, it's impossible to see 1 micron with the 15 naked eye. But I magnified this 4,300 times. 16 So now you can see the individual fibers. And 17 if you take the little bar and you put it up on the 18 fibers, you can see that some of them are about a micron 19 thick, and some of them are hundreds of microns long as 20 they go off the screen. Some of them are less than a 21 micron, much less. Here's -- these are about a 10th of 22 1 micron, and that's the nature of asbestos. 23 You see here, it's starting out as about a 24 micron, and then it breaks down to half a micron, and 25 then less than that. And that's the nature of

42 1 chrysotile. It's constantly breaking down into smaller, 2 shorter, and thinner fibers. 3 That -- that's what chrysotile does. It does 4 it in the soil. It does it in the product. And it does 5 it in the air and in the lung. So it's constantly 6 breaking down. 7 Q. Okay. 8 A. All right. So we made an aerosol of this. Let 9 me show you then where it goes in the lung. Here now 10 this is the lung of a rat. I'm showing you the end of 11 the airway where it opens out into the gas exchange 12 area. Here are the air spaces that you see out here. 13 And this is one of millions of spots like this around 14 the lung. 15 But this is from the lung of a rat that was 16 exposed for a single hour. And then at the end of the 17 hour, took the animals out of the chamber, gave them an 18 overdose of anesthetic, and then we're able to see where 19 the fibers land because since they -- we gave them the 20 anesthetic, we gave them the overdose, so they didn't 21 wake up from that. And any asbestos that's in the lung, 22 obviously, landed during that first hour of exposure. 23 Okay. So I'm going to focus the microscope on 24 this spot right here. This will be the carpet, 25 actually, right here. So this black hole right here --	44 1 fiber. Here you can see the fibers, but you can't see 2 them here. 3 There's actually fibers here, but you can't see 4 them here. This is about 20 percent of the fibers get 5 covered by the epithelial cells and shoved under the 6 carpet. Now, I say shoved under the carpet because 7 that's sort of a common saying. But, in fact, we have a 8 storage space under the carpet. You know, all of us -- 9 I don't know. 10 You may have heard by now, but all of us have 11 some asbestos in our lungs. We all have some fibers 12 that we've accumulated from the background of asbestos 13 in the air. It's not very much. I mean, there are very 14 few fibers floating around in the air in our background. 15 But as you live your life, you're accumulating 16 them, in very small numbers, over time. And where are 17 those fibers in our lungs? They are under the carpet in 18 our lungs. This is where we store things. So there's 19 asbestos there. 20 There are carbon particles, silica particles, 21 things that we inhale as we walk around all day. Not 22 enough to cause disease in the average person, but my 23 point is that there's a storage space under there. 24 It turns out that under the carpet is also 25 the -- what we call the fluid flow of the lung. And I
43 1 so here's the edge. So -- so this area right here, I'm 2 filling the screen with this now. So here's the carpet. 3 This black hole right here is this black hole right 4 here. 5 Okay. So we're looking at this structure here, 6 and now, immediately after exposure, we, can see a whole 7 array of asbestos fibers sitting on the carpet, these 8 epithelial cells. This is a 10 micron bar down here. 9 You can see this fiber is about 10 microns long. Here's 10 a long, curly fiber going up on the carpet. There are 11 some short, straight fibers. 12 The key here is that some of these fibers, we 13 realized, were no longer sitting on the surface of the 14 carpet. So this is one of these things that you don't 15 expect to see, because we really didn't know what to 16 expect, actually. But -- because we didn't know where 17 the fibers were going to go. 18 But it turns out that these epithelial cells 19 that make up the carpet respond very quickly to the 20 presence of the fibers, actually come up over the 21 fibers, and shove them under the carpet. 22 Q. What -- how does that happen? 23 A. Right. So, actually, you can see that here. 24 Here you can see some of the fiber. And then there's 25 some of the -- the edge of the cell coming up over the	45 1 can show you that in the next slide. 2 Q. Okay. 3 A. Okay. So here's another one of these spots 4 around the lung. And -- and, of course, I'm showing you 5 this as a single picture as an example of hundreds of 6 pictures like these and papers that I've written 7 explaining this very topic that I'm explaining to you 8 now. It -- this isn't just because I say so. This is 9 because this is published in the open medical 10 literature. 11 Okay. So here's an air space up here. There's 12 another air space here; another one here. There's an 13 asbestos fiber bundle sitting right here. You can 14 actually see a little bit of a fiber moving into this 15 what we call the fluid flow. 16 And notice these characters here that look like 17 doughnuts. And they're kind of lined up. They're lined 18 up one behind the other. You can see a group of fibers 19 here, and you can see they're -- they're -- they're 20 covered here. There's a fiber that's completely covered 21 over here. 22 These structures that look like doughnuts are 23 red blood cells. Now, our red blood cells look like 24 doughnuts because they have a depression in the 25 center -- not a hole but a depression. It makes it look

46 1 like -- sort of like a doughnut. 2 Now, I -- I said this is what our red blood 3 cells look like, but this is the lung of a mouse. Okay. 4 So, again, mouse, rats, cats, guinea pigs, giraffes, 5 elephants, we all have the same size structure, shape, 6 and function of our red blood cells. 7 And those red blood cells move through the 8 small vessels of the lung. And here you can see that a 9 small fiber is actually moving into the blood flow. And 10 we've published that. Other investigators have shown 11 that there's asbestos flowing in the blood. 12 But there's another even more significant 13 pathway to the pleura, and that's called lymph. 14 Q. What is lymph? 15 A. So lymph, l-y-m-p-h, is clear fluid that runs 16 from head to toe in our bodies. Wherever blood flows, 17 there's lymph flowing around it. Lymph carries cells of 18 the immune system, and lymph also helps to control the 19 blood pressure, the pressure in certain vessels in our 20 body. 21 Q. Okay. 22 A. And it turns out that asbestos gets into the 23 lymph. And the reason we know that is because we have 24 certain structures called lymph nodes. 25 Lymph nodes are small bundles of tissue that	48 1 and we know that there's lymph in the pleura, because 2 because, as Dr. Netter is showing you, there is a 3 pattern of flow to the pleura. So I'm going to 4 highlight that in the next diagram. 5 I'm going to cut out a piece of tissue where 6 the pleura is on the right. You'll see the lymph 7 vessels flowing to the pleura, and it gives more detail 8 on this topic. 9 And that's actually the final topic I'm going 10 to talk about with the structure and the -- and the 11 movement in the lung -- of the fibers, and then I'll 12 finish by talking about how these fibers that get to the 13 mesothelial cells cause cancer. 14 Q. Okay. 15 A. And so it's the mesothelial cells that are 16 lining the outside of the lung. So let's cut this out, 17 take a picture of it, and here's then this picture. 18 Here's the mesothelial surface on the right 19 side of the lung, and here are those lymph vessels that 20 we just looked at. So this lymph vessel, this lymph 21 vessel are the same as this lymph vessel, this lymph 22 vessel but with more detail. 23 And you can see here that the artist is giving 24 us an asbestos fiber flowing into the air spaces. 25 There's another one over here, and they're coming into
47 1 filter all of the lymph fluid that we have that flows 2 from head to toe, and those lymph nodes can be found 3 around the lung. Let's see. 4 All right. So here, for example, is a diagram. 5 This is called a -- a Netter diagram because Dr. Netter 6 has published atlases of the human body and health and 7 disease. And Dr. Netter is giving us the pattern of 8 lymph flow in the lung. And you can see he's got a 9 series of vessels that end at the pleura that are 10 carrying this clear lymph fluid. 11 He also is showing you these bundles of tissue 12 around the lung called lymph nodes. These are thoracic 13 lymph nodes because they're in the thorax. They're 14 around the -- in the chest cavity. And some 15 investigators -- this isn't my work, but some 16 investigators asked if asbestos was collecting in the 17 lymph nodes around the lung, and the answer is yes. 18 Now, the only way that asbestos can get into 19 the lymph nodes is to get -- to be inhaled, pass into 20 the fluid flow of the lung by way of these epithelial 21 carpet, get carried by way of the lymph vessels, and be 22 filtered out in the flow by the lymph nodes. That's the 23 only way they can get into these nodes. 24 Q. Okay. 25 A. So now we know that there's lymph in the nodes,	49 1 the air spaces. 2 Here the artist has an asbestos fiber that's 3 sort of sticking in from the air space and into the 4 lymph flow in the lung, sort of the same as the picture 5 I took over here of it actually happening with the 6 asbestos fiber poking into the flow -- fluid flow of the 7 lung. 8 And so here, now, the artist says, lymphatic 9 fiber transport to the pleura. So this is how the 10 pleura -- this is how the mesothelial target cells, the 11 target cell for mesothelioma, this is how the target 12 cells get exposed. 13 Q. Okay. So once you breathe in an asbestos 14 fiber, it can land on the surface of your lung. But 15 unless it gets to the mesothelio- -- or unless it gets 16 to the pleura, it's not going to cause a mesothelioma in 17 the pleura; is that right? 18 A. Correct. 19 Q. Okay. And what you're saying is that the -- 20 the way it gets from the landing spot to the pleura is 21 through the lymph system -- 22 A. That's correct. 23 Q. -- right? 24 A. That's right. 25 Q. Okay.

50 1 A. That's right. 2 Okay. So now we have the cells at the target 3 cell -- we have the asbestos at the target cell. So we 4 can spend the rest of the time talking about how this 5 cancer is caused. And I -- and I have a diagram of the 6 cancer, a mesothelioma. 7 This is what a normal pleura should look like 8 in a person; very thin and shiny. I mean, when you -- 9 when you breathe, your lungs are rubbing up against the 10 inside of your chest cavity, but you don't feel that. 11 The reason you don't feel it is because the 12 mesothelial cells, along with the lymph -- the 13 mesothelial cells produce a fluid, along with the lymph, 14 that reduces any friction that you might have between 15 the lungs and the pleura -- and the chest wall. So we 16 don't feel the lungs moving. And that's, of course, 17 exactly what should happen. 18 Now, in a person -- so you can see how thin 19 that is. In a person with a mesothelioma, the pleura is 20 dramatically thickened with tumor cells. This can be a 21 very painful process. You can also see how some of the 22 tumor cells are invading the lung; some actually growing 23 down into the -- into the diaphragm. 24 Okay. So -- so that's the cancer. Now, I'm 25 going to spend -- I have four -- five or six more slides	52 1 They're less likely to fracture into those very small -- 2 smallest fiber types. And as a result, they're less 3 likely to be found at the pleura and in the nodes. 4 Q. Okay. Thank you. 5 A. Okay. 6 Q. What do we see here in this image, Doctor? 7 A. All right. So we're going to talk about 8 cancer, and let me give you the simplest definition of 9 cancer. Cancer is the loss of control of cell growth. 10 So I -- I'm going to say that again, and then I'm going 11 to explain it. Okay. Cancer is the loss of control of 12 cell growth. 13 Now, this slide is from the cover of a 14 proceedings of a meeting that I was at a few years ago. 15 I gave a talk at this conference. And the conference 16 was focused on how fibers cause cancer. There's the big 17 word carcino-, cancer, -genesis, formation. 18 How do fibers cause cancer? I've talked to you 19 today about cells, and I've showed you that cells can 20 pick up fibers. But you really cannot talk about cancer 21 unless you talk about the molecular aspects, and that 22 means your genes. 23 Q. Okay. 24 A. Cancer is a genetic disease. 25 Q. What does that mean?
51 1 explaining how the asbestos, at the target cell, causes 2 them to be a cancer cell. 3 Q. Okay. Now, Doctor, you mentioned that there 4 are different types of asbestos fibers, and the jury's 5 going to hear a lot about that in this case. 6 Have there been studies done of the pleura in 7 people to show what types of asbestos fibers actually 8 get from the landing spot all the way out to the pleura 9 where mesothelioma happens? 10 A. Yeah, exactly. I mean, what some investigators 11 have done is they collect tissue from the lung. They 12 collect tissue from the pleura. They collect tissue 13 from the lymph. And then they ask what kinds of fibers 14 have accumulated in those various areas of the lung 15 and -- and the lymphatics. 16 And they found that the predominant fiber is 17 chrysotile. And the reason that the predominant fiber 18 is chrysotile is because it tends to break down. It's 19 the smallest fiber and more easily is transported in the 20 lymphatics. So that's why it ends up there. 21 Q. Okay. You mentioned that chrysotile tends to 22 break down. Is there a different rate at which the 23 various fiber types break down in the human body? 24 A. Yeah, they do. The amphiboles, amosite and 25 crocidolite and tremolite, tend to be more durable.	53 1 A. Right. That means that you need to have 2 defects in certain genes to cause -- to have a cancer. 3 So I told you that cancer is the loss of control of cell 4 growth. Humans have about 20,000 or so genes that make 5 us what we are. 6 And you can look around, and you can see what a 7 few of those genes do. You can see different hair 8 color, eye color, skin color, different body sizes, 9 different abilities of certain kinds. And -- and those 10 are related to genes and genetics, those 20,000 or so 11 genes. 12 Most of what our genes do you don't get to see. 13 You don't get to see the -- the genes that are making 14 this fantastic waterproof skin we have. You don't see 15 those genes working. You don't see the genes that make 16 digestive enzymes that digest our food. 17 So most of the genes and the gene products and 18 the things they do, we don't get to see. But of the 19 20,000 or so genes, about 100 of them are called growth 20 control genes. 21 Q. What does that mean? 22 A. So I told you that cancer is the loss of 23 control of cell growth. Now I'm going to tell you that 24 cancer develops when there are errors or mistakes, 25 sometimes called mutations, in a set of genes that

54 1 control cell growth. 2 So, for example, if I took a piece of your skin 3 out, and I put it under a microscope, I can show you 4 that about 10 percent of your skin cells are growing, 5 making -- you're making -- growing means not just 6 getting -- not getting bigger but actually increasing in 7 number 8 So your skin cells are increasing, making new 9 skin cells all the time because you're always losing 10 skin. So about 10 percent of them are -- of these skin 11 cells are divided. In your lung and your liver, about 12 1 percent. And on the mesothelial surfaces, about a 13 half of 1 percent; very low kind of background rate. 14 So the mesothelial cells, or any cell type, 15 that growth rate is controlled -- very strictly 16 controlled by sets of genes. Cancer is the loss of 17 control of cell growth, and that means that there must 18 be errors or mistakes in a set of genes that control 19 cell growth. And that's what carcinogens do. 20 Cancer-causing agents, like asbestos, cause errors in 21 genes that control cell growth. 22 So how do they do that? And then -- then I'm 23 going to finish this. There -- there are a couple of 24 ways to study that. One of the ways is to take cells 25 out of the body of humans and animals, put the cells in	56 1 Now, one of the things that scientists have 2 known for a long time is that, when cells divide, when 3 you're making new cells, we lose that protective 4 membrane. So we asked in my laboratory and in 5 laboratories of collaborators adjacent to us, we 6 asked -- along with them, we asked, what would happen if 7 we added fibers in cells that were dividing. 8 Q. Okay. So what we see here are -- are fibers 9 collected around the -- the nucleus of these two cells; 10 right? 11 A. That's right. 12 Q. And they're being excluded, as you say, from 13 the nucleus by -- is it the nuclear membrane? 14 A. That's correct. 15 Q. My biology teacher would be proud I remembered 16 that. 17 Is there a time when the nucleus is vulnerable 18 to fibers? 19 A. Exactly. And that was described in 1980, in a 20 very famous paper, showing that, when a cell is 21 dividing, it's more likely to become a tumor cell, yeah. 22 Q. Okay. And so if asbestos is present during 23 cell division, that's when it can potentially cause 24 genetic errors -- 25 A. Exactly.
55 1 a dish, and add the fibers to these cells. You can give 2 the cells the appropriate nutrients, and the cells will 3 grow -- continue to grow in the dish. And you can add 4 the agents that you're interested in. And that's 5 actually been done. 6 On the surface -- on the cover of these 7 proceedings, there are two cells. I'm outlining one of 8 them here, and there's another one over here. And you 9 can see some fibers have been added. There's kind of a 10 long fiber there and some short fibers. And notice how 11 the fibers are collected around the center circle in the 12 cell, but they're excluded from that center circle. 13 Now, the center circle is called the nucleus, 14 and the nucleus of our cells contains all of our DNA. 15 DNA is -- that's our genes, and DNA just means our 16 genetic material. And genes are short sequences, 17 specific sequences, of that DNA that make us what we 18 are. 19 And all the DNA's in the center circle called 20 the nucleus. Now notice all the fibers have been 21 excluded from the nucleus. Now, that -- that's a good 22 idea because I'm going to show you that -- that when 23 asbestos interferes, gets in -- into the nucleus, it can 24 interfere with the DNA. So it's a good idea for the 25 nucleus to remain intact and exclude the fibers.	57 1 Q. -- is that right? 2 A. Exactly. 3 Q. Okay. What do we see here, Doctor? 4 A. Right. And so now we're going to go into that 5 process of cell division, normally what's supposed to 6 happen, and then we'll add asbestos. 7 Q. Okay. 8 A. Okay. So here's what's supposed to happen. 9 Here are three cells: one, two, three. The two cells 10 on the outside are not dividing. The nucleus is intact. 11 The DNA's been stained blue so you can see where it is. 12 The cell in the center has received a signal to 13 divide. I mean, it could be it's skin -- if it were a 14 skin cell and you had a wound or skin cells scraped 15 away, and then its neighbors would have to start 16 dividing more quickly to fill in that wound or -- that's 17 one reason it could be dividing. Or I could have had a 18 growth hormone, and it would be dividing. 19 Whatever the reason, what we do is we 20 concentrate our DNA into these white threads called 21 chromosomes. Chromosomes are bands of condensed DNA. 22 And the idea is to make perfect copies of all of our 23 chromosomes during cell division so we have two cells 24 just like the original. 25 And this is what our chromosomes look like.

58 1 This is a human set of chromosomes. Humans have 2 23 pairs of chromosomes. You got one from your mother 3 and one from your father. And you can see these light 4 and dark bands that line up on all of the chromosomes. 5 And it's those light and dark bands that indicate where 6 all of those 20,000 or so genes are distributed. 7 The take-away message from this slide is that 8 every gene must be on the correct chromosome and in the 9 right place on that chromosome. And if that is not 10 true, then the gene that is not where it belongs will 11 not function. 12 So that's why, as we finish this process of 13 normal cell division, where the chromosomes have formed, 14 now they go through what's called faithful replication. 15 We get two daughter cells just like the original. 16 That's what's going on in all of us all the time, and 17 that's what is supposed to happen. 18 Q. Okay. 19 A. Okay. So now let's put asbestos into the mix 20 here. So these are -- again, here is one cell out of 21 millions in the dish. I'm just showing you one of them. 22 There are no -- this is a control population, no fibers. 23 Half of the chromosomes will go to one side, half to the 24 other, and we'll get to daughter cells. We call them 25 daughter cells.	60 1 it's supposed to be. Now, these are not cancer cells. 2 Aneuploid cells are not cancer cells, but the door has 3 been opened. 4 And the reason the door has been opened is 5 because of what I told you, that all the DNA, all the 6 genes must be on the correct place, on the correct 7 chromosomes. 8 Q. Okay. 9 A. This DNA, obviously, is not where it's supposed 10 to be. So any genes that are in this DNA are not going 11 to work. 12 Q. Now, you said these are actually mesothelial 13 cells? 14 A. That's right. 15 Q. And that's the type of cell in which 16 mesothelioma occurs? 17 A. Exactly. And, of course, that's why these 18 cells were chosen to -- to do these kinds of 19 experiments. 20 Q. Right. 21 A. You can do them in any kind of cell. I mean, 22 all the cells will teach you important things, but, of 23 course, it's important to be able to actually carry out 24 these kinds of experiments in the target cell, 25 mesothelial cells.
59 1 Q. Okay. 2 A. Here we've added crocidolite. And you can see 3 kind of a long crocidolite fiber about 30 microns long. 4 There's a 20 micron crocidolite fiber, and then there's 5 some small five micron fibers. And most of the DNA has 6 moved to the new cell, but some of the DNA is bound to 7 the surface of the fibers. 8 Q. Okay. 9 A. Now, this results in a condition up -- as you 10 see up here, called aneuploidy. 11 Q. What does that mean? 12 A. Okay. I'm going to show you one more example 13 of that, and then -- and then I'll answer your question. 14 Q. Okay. 15 A. This is aneuploidy in mesothelial cells treated 16 with chrysotile. Same concept. Normal mesothelial cell 17 here. Half the chromosomes go to one side; half to the 18 other. We'll get two daughter cells. 19 In fact, here, there are two daughter cells 20 essentially formed, but there's a chrysotile fiber 21 spanning the cell, and there's some DNA bound to the 22 surface of the fiber. Again, this is aneuploidy, and 23 aneuploidy means abnormal chromosome separation. 24 Q. Okay. 25 A. That means that all of the DNA is not where	61 1 Q. And you can see in this image that the 2 chrysotile is actually interfering with the faithful 3 replication of the cell -- 4 A. That -- 5 Q. -- correct? 6 A. That's right. 7 Q. And so if -- if some of the genes that the 8 chrysotile is interfering with happened to be those 9 growth control genes you mentioned, then you are, as you 10 say, opening the door to cancer -- 11 A. Pre -- 12 Q. -- is that right? 13 A. Precisely. 14 Q. Okay. 15 A. Precisely, right. 16 Okay. So I have one more slide. This is the 17 last slide. And on this slide, I'm going to review 18 basically what I -- what you -- the important point you 19 just made about what these genes are actually doing and 20 how they get damaged. 21 And then I also want to explain what's going on 22 during that period called latency, time from first 23 exposure until the time the person comes to the clinic, 24 typically decades. 25 Now, I don't know what the latency period is in

62 1 this particular case, but usually it's 30 to 50 years. 2 So I'd be surprised if -- if it were different than 3 that, but it -- sometimes it's 20 years, sometimes it's 4 60 years, you know. So all -- all of those are 5 reasonable, but usually they're between 30 and 50 years. 6 So what's going on in that time, and I'll 7 explain that, and then I'll be finished. 8 Q. Okay. 9 A. All right. So here the artist is giving us a 10 layer of mesothelial cells. You can see the single 11 nucleus in the cell, and the cells are tightly apposed 12 to one another. And then the artist has a couple of 13 lightning bolts coming in here. 14 Now, obviously, lightning doesn't cause DNA 15 damage, as -- as it says here, DNA damage. What -- what 16 the artist is indicating is something from the 17 environment has reached the DNA of the target cell for 18 this cancer mesothelioma. We're talking about a 19 mesothelioma, so we're talking about asbestos having 20 reached the target cell and caused DNA damage. 21 So the cell with DNA damage is dividing, and 22 he's got one of the cells going up here into the upper 23 left-hand corner, with the DNA clumped up, and the cell 24 bubbling up and dying. The cell is dying. Now, the 25 reason the artist is showing that is because he knows	64 1 it's supposed to be and makes it more likely that these 2 errors will happen. As you can see here, the DNA damage 3 now leaves a daughter cell alive and intact, and then 4 the artist shows the development of a tumor. 5 So what we have to do to finish here is we take 6 the -- the daughter cell, and then from the time that 7 the daughter cell develops, so the time the tumor shows 8 up in the clinic, you've got to give me about 40 years 9 or 50 years. 10 Q. Okay. 11 A. Okay. That's the latency we're talking about. 12 Now, what's -- what's going on in this time 13 period? And I'm going to answer that question. 14 Q. Okay. 15 A. So think about, on the surface -- on the 16 mesothelial surface, that cell, with an error, sitting 17 on the mesothelial surface among the hundreds of 18 millions of mesothelial cells that are there. It sits 19 there looking and acting like a normal mesothelial cell. 20 You'd never know it was there. 21 It has the error, but it's not enough to change 22 the function of the cell or change the way it looks or 23 acts. Okay. And that cell sits there. Eventually, it 24 has to divide. I told you it has a low background rate 25 of about half percent, but still eventually it has to
63 1 very well that most cells with DNA damage die, and you 2 never hear anything more about them. 3 Of the 100 or so genes that control cell 4 growth, I -- I'm going to tell you about two of them. 5 One of them is called p53. p53 is what's called a tumor 6 suppressor gene. So if a cell has DNA damage, that gene 7 gets activated and stops the cell from dividing so it 8 can't pass on those mistakes. 9 Q. So it's another defense mechanism of the body? 10 A. It's a genetic defense mechanism, absolutely 11 right, and it's an essential one. p53 is -- is damaged 12 in about 50 percent of all human cancers. It's a 13 central protective mechanism. 14 There's another set of genes called death 15 pathway genes. That if there's DNA damage, those death 16 pathway genes kick in and drives the cell down a death 17 pathway, just like this one, and you'll never hear 18 anything more about it again. 19 Now, what if -- and you remember these 20 aneuploid cells. What about if in this DNA or in this 21 DNA is one or more of those growth control genes or 22 tumor suppressor genes or death pathway genes, they're 23 not going to work. They're not going to protect us. 24 That's why the aneuploid cells are not cancer 25 cells, but the door's open because the DNA's not where	65 1 divide. Two cells, four cells, eight cells, 16, 32, 2 kind of making a field of cells progeny of that original 3 cell, all with that error because it passed on the 4 error. 5 Some of those cells may die. You may kick in 6 another pathway. We have several different death 7 pathways. One or more of these cells may die. One or 8 more of those cells may get hit again by another 9 asbestos fiber. And now you have one or more cells on 10 the pleural surface with two errors. And that cell -- 11 and genes that control cell growth, by the same 12 mechanism we've just looked at. 13 And -- and that cell then sits there looking 14 and acting like a normal mesothelial cell for months. 15 Eventually, it starts to divide. Two cells, four cells, 16 eight cells, 16, 32, 64, all with those two errors, and 17 one or more of those cells gets hit again. Okay. So 18 I -- I could stand here and do that for decades. Just 19 stand here and talk about that. Obviously, I'm not 20 going to do that. 21 Just think about that process proceeding 22 through the decades where the person is exposed to 23 asbestos, has accumulated asbestos, is no longer exposed 24 but has many fibers sitting in the lung. And then 25 there's another important point here, and that is, not

66 1 only does asbestos bind DNA -- 2 Q. That's what we saw pictures of; correct? 3 A. That's what you saw pictures of. 4 -- but it also generates what are called oxygen 5 radicals. 6 Q. What are those? 7 A. So oxygen radicals are high-energy, short-lived 8 chemical compounds that are known to cause DNA damage. 9 It's the main way that cigarette smoke causes lung 10 cancer. It's the main way that ultraviolet rays from 11 the sun cause skin cancer. 12 Ultraviolet rays and all -- and other agents 13 generate these high-energy, short-lived compounds called 14 oxygen radicals, reactive oxygen species. Some people 15 think you should take a lot of antioxidants. I'm -- I'm 16 not saying to do that. 17 What I'm saying is that we know that these can 18 be dangerous agents if you get too much of them. Most 19 of us walk around with sufficient antioxidants in our 20 blood that we don't have to worry about taking 21 antioxidants. 22 All of the asbestos varieties generate oxygen 23 radicals. And in my laboratory, and other laboratories, 24 we've demonstrated that these oxygen radicals damage 25 DNA. We -- and we've shown that chrysotile and other	68 1 two. Back on the record at 11:53 a.m. 2 Q. (By Mr. Stuemke) Now, Doctor, before we talk 3 about which asbestos fibers cause mesothelioma, which we 4 addressed some with your presentation, let me just ask 5 you a few general questions about the causes of 6 mesothelioma. 7 First, does smoking cause mesothelioma? 8 A. No, it doesn't at all. Cigarette smokers do 9 not have an increased incidence of mesothelioma, and 10 people who are exposed to asbestos, who obviously have 11 an increased risk of mesothelioma, do not add to that 12 risk by smoking. 13 Q. Okay. What are the accepted causes of 14 mesothelioma in North American people? 15 A. Well, really the only environmental cause is 16 asbestos exposure. I mean, there are a few cases that 17 can be caused by radiation. In other words, high-dose 18 therapeutic radiation to the chest wall has caused a few 19 cases. 20 You know, there are some cases where you don't 21 know the cause that might be caused by inflammation. 22 But the -- the great majority of cases are known to be 23 caused by asbestos. 24 Q. Okay. Are there any publications that address 25 the criteria one should use in determining whether a
67 1 asbestos fiber types generate oxygen radicals. 2 So you have two -- at least two mechanisms that 3 we know of through which asbestos can cause genetic DNA 4 damage. One is by direct binding, and the other one is 5 by generation of oxygen radicals. 6 Now, go out to the end of that latency, an 7 individual develops -- an individual has a cell or set 8 of cells with sufficient number and combination of 9 errors to cause cancer, where the cell loses control of 10 growth. And that's what the artist has produced here. 11 And the reason they're all the same color is 12 because the artist knows that this tumor can come from a 13 single cell with sufficient number of errors and 14 combination for that person. And now then it grows out 15 and brings the person to the clinic, and then you have 16 the diagnosis of mesothelioma. 17 Q. Okay. Thank you very much, Doctor. 18 A. Sure. 19 MR. STUEMKE: Let's take a short break 20 while we rearrange the room here for the deposition. 21 THE WITNESS: Yeah. 22 THE VIDEOGRAPHER: We've reached the end of 23 tape one. We're off the record at 11:44 a.m. 24 (Break from 11:44 to 11:53.) 25 THE VIDEOGRAPHER: This is start of tape	69 1 particular mesothelioma is caused by asbestos exposure? 2 A. Sure. Starting in 1997, there was a conference 3 called the Helsinki conference that was actually set up 4 to do just that; in other words, criteria -- they're 5 called the Helsinki criteria; so the criteria for 6 attribution. 7 What do you need to attribute a cancer or an 8 asbestos disease to exposure, and what -- and how do you 9 establish cause. So that was originally written in 10 '97, and then it was reviewed again just recently, just 11 a couple of years ago, and essentially affirmed. 12 Q. Okay. And in a nutshell, what do the Helsinki 13 criteria require in order to attribute a particular 14 mesothelioma to asbestos exposure? 15 A. You need -- you need a history of exposure 16 really. I mean, that's just the -- you know, if a 17 person has scarring in the lung and -- or if they have 18 some other signs of exposure, you -- you would know that 19 they were exposed. 20 But -- but really it's the history. The -- the 21 history is what you need to know, that the person was 22 exposed. 23 Q. Okay. 24 A. And that's then the cause. 25 Q. From your perspective, as somebody who's been

70 1 researching cellular and genetic level how asbestos 2 causes mesothelioma and other disease for 40 years, do 3 you have an opinion as to whether chrysotile asbestos 4 specifically can cause mesothelioma in humans? 5 MR. PUCCI: Object to form. 6 A. Yes, it does. I mean, there is some very good 7 epidemiology that -- epidemiology is the study of 8 populations, and it studies who gets sick in that 9 population and from what. 10 And the epidemiology, over the last few years, 11 has been very clear on that. 12 Q. (By Mr. Stuemke) Okay. And was your opinion, 13 about chrysotile causing mesothelioma, the same when 14 John Crane asked you to offer that opinion in -- in 15 court? 16 A. Without a doubt. 17 Q. Okay. 18 MR. PUCCI: Object to form. 19 A. Sure, it was. 20 Q. (By Mr. Stuemke) Have governmental and medical 21 organizations expressed opinions about whether 22 chrysotile can cause mesothelioma? 23 A. They have, yes. 24 Q. And can you give us some examples of what they 25 have said?	72 1 disease. So, I mean, that's the simple answer. There's 2 no way to know just how much it takes because it's so 3 different for different people. 4 Q. Okay. And is part of the reason for the 5 differences, from one person to another, what we looked 6 at in the presentation with the accumulation of genetic 7 errors that have to happen in order for it to occur at 8 all? 9 A. Yeah, exactly. This is susceptibility. So 10 it -- it's genetic susceptibility. Some people's genes 11 are more likely to be damaged than others. Some people 12 have additional sets of protective genes that won't be 13 damaged versus others that may. 14 Q. What is the concept of cumulative dose when 15 you're talking about asbestos-related disease? 16 A. Uh-huh. Well, every time a person's exposed, 17 some component of that dose accumulates in the lung. 18 Asbestos fibers are cleared over time by those 19 mechanisms that I showed you, but there's always some 20 component of that exposure that accumulates. And the 21 more that accumulates, the more likely you are to get a 22 cancer. 23 Q. Okay. In a person that develops mesothelioma, 24 is it possible for you, as a scientist, to look at that 25 individual's history of exposure to asbestos and say
71 1 A. Well, I mean, for example, the Environmental 2 Protection Agency, the World Health Organization, the 3 American Cancer Society, National Institutes of Health, 4 all -- all the agency -- every government agency that 5 has ever asked the question has established that all the 6 asbestos varieties cause all of the asbestos diseases. 7 Q. Okay. Now, are some types of asbestos believed 8 to be more potent in causing mesothelioma than others? 9 A. Yes. I mean, if -- if all you're exposed to is 10 crocidolite or amosite, you're more likely to get a 11 mesothelioma than if all you're exposed to is 12 chrysotile. So that means it's more potent. On a 13 fiber -- but on a fiber-for-fiber basis, it depends on 14 what you're exposed to. 15 In other words, if you're exposed to 16 chrysotile, then that causes mesothelioma. If you're 17 exposed to amosite or crocidolite, causes mesothelioma. 18 If you're exposed to a combination of those, they all 19 contribute to the development of that disease. 20 Q. How does the amount of asbestos that a person 21 breathes relate to their likelihood of later developing 22 a mesothelioma? 23 A. Right. So -- so these -- all the asbestos 24 diseases are dose-response diseases. The more you're 25 exposed to it, the more likely you are to get the	73 1 certain exposures caused it, other exposures wouldn't 2 have contributed at all? 3 A. No. 4 MR. PUCCI: Object, form. 5 A. That -- that's impossible. And -- and you 6 can't really do that with any carcinogen. I mean, a 7 good example of that is a cigarette smoker who gets -- 8 who gets lung cancer. Okay. So it's -- it's a 9 different carcinogen. It's a different cancer, but it's 10 the same answer. 11 In other words, if you ask me, so here's a 12 lung -- here's a lung cancer in a smoker, can you tell 13 me which pack of cigarettes or which carton of 14 cigarettes or which year the person was smoking caused 15 the cancer? No. 16 I mean, every time he smoked a cigarette, he 17 added carcinogens to the target site, and finally he 18 developed sufficient errors from that accumulation of 19 errors to cause the cancer. It's the same answer 20 regarding asbestos and a person's exposure. 21 Q. (By Mr. Stuemke) Okay. Finally, Doctor, I'm 22 going to ask you, is there a safe level of exposure to 23 asbestos that's been recognized? 24 A. There's no level that's been established as 25 safe; in other words, a level that we know will not

74 1 cause a cancer. We -- we don't -- that's never -- it's 2 called a threshold. In other words, is there a 3 threshold below which there's no evidence of cancer? 4 None's been established that I know of. 5 Q. Doctor, I want to ask you a couple of 6 hypothetical questions relating to Mr. Voelker's case. 7 First, I'd like you to some assume that Mr. Voelker was 8 diagnosed with pleural mesothelioma in August of 2013 9 and died on Christmas day of 2013. 10 I'd like you to assume that he installed and 11 removed John Crane asbestos gaskets and packing on a 12 regular basis during the four years he served in the 13 United States Navy. 14 I'd like you to assume that, when installing 15 John Crane gaskets, he used scissors and a steel punch 16 to fabricate the gasket, creating visible dust that he 17 breathed. 18 I'd like you to assume also that he removed 19 John Crane gaskets using a paint scraper and wire brush, 20 creating visible dust that he breathed. 21 I'd also like you to assume that he cut and 22 installed new John Crane packing with a scissors or 23 knife and removed old John Crane packing with a packing 24 hook, and that these tasks created visible dust that he 25 breathed.	76 1 this hypothetical. 2 MR. STUEMKE: Okay. 3 A. I -- I do have an opinion. 4 Q. (By Mr. Stuemke) What is that opinion, Doctor? 5 A. Yeah. Well, that is that those kinds of 6 exposures would certainly contribute. The person got 7 a -- developed a mesothelioma; therefore, it's a 8 substantial factor in producing the cancer. 9 Q. Okay. Because of the objection and because the 10 judge isn't here to rule on it, I'm going to ask you a 11 similar question in a couple of ways. 12 Dr. Brody, I'd like you to assume that 13 Mr. Voelker installed and removed asbestos gaskets and 14 packing on a regular basis during the four years he 15 served in the United States Navy. 16 I'd like you to assume that, when he installed 17 gaskets, he used scissors and a steel punch to fabricate 18 the gasket, creating visible dust that he breathed. 19 I'd like you to assume that, when he removed 20 gaskets, he used a paint scraper and a wire brush, 21 creating visible dust that he breathed. 22 I'd like you to assume that he cut and 23 installed new asbestos packing with a scissors or knife 24 and removed old asbestos packing with a packing hook, 25 and that these tasks also created visible dust that he
75 1 Assume that he wore no breathing protection 2 during this work, and that this work occurred hundreds 3 of times during his Navy career. 4 I'd like you to assume that, when he worked 5 with these gaskets and packing materials in the way he 6 described, that he was exposed to levels of asbestos 7 fiber in the air that exceeded ambient levels by 8 thousands to millions of times. 9 With those assumptions in mind, Doctor, do you 10 have an opinion whether exposure to asbestos fibers from 11 the John Crane gaskets and packing substantially 12 contributed to that mesothelioma? 13 MR. PUCCI: Object. 14 Can we go off the record? 15 MR. STUEMKE: You want to go off the video 16 record? 17 MR. PUCCI: Yeah. 18 THE VIDEOGRAPHER: I need you to tell me. 19 Is it okay? 20 MR. PUCCI: Okay. Fine. Then we'll just 21 object to the hypothetical. I believe it's beyond the 22 scope of this witness's expertise. 23 Further, if the facts in the hypothetical 24 do not bear out at trial, we would further move to 25 strike any opinions that Dr. Brody may have regarding	77 1 breathed. 2 I'd like you to assume he never wore any 3 breathing protection while doing this work, and that 4 each time he did this work with asbestos-containing 5 gaskets and packing materials, he was exposed to levels 6 of asbestos fibers in the air that exceeded ambient 7 levels by thousands to millions of times. 8 I'd like you to assume, finally, that he did 9 this work hundreds of times during his Navy career. 10 With these assumptions in mind, do you have an 11 opinion whether exposure to asbestos fibers from those 12 gaskets and packing materials substantially contributed 13 to his mesothelioma? 14 MR. PUCCI: Same objections as to the 15 previous hypothetical. 16 A. Yes. 17 Q. (By Mr. Stuemke) And what is that opinion, 18 Doctor? 19 A. Yes, it -- it's that that exposure would 20 clearly have contributed and, since it was obviously a 21 cancer developed, then it was a substantial factor in 22 producing his cancer. 23 Q. Now, Doctor, I'd like to change the 24 hypothetical a little bit and ask you to assume also 25 that he had asbestos exposure to other chrysotile

78 1 asbestos products over the years, including brakes and 2 other gasket materials, and that he also had a 3 significant amount of exposure to amphibole asbestos 4 while in the Navy from insulation materials, as well as 5 potentially some household exposure as a child from his 6 father who worked with asbestos materials. 7 What affect would the existence of those other 8 exposures have on your opinion of the causal role of the 9 exposures from asbestos gasket and packing materials? 10 MR. PUCCI: Same objections as previously. 11 A. Well, none of those new -- none of that new 12 information changes my opinion in any way. I mean, it's 13 just, as the first question you asked me, I mean, how 14 does -- how does a cumulative exposure cause the 15 disease. And all of these sources of exposure would 16 cause accumulation of fibers and be a part of the 17 disease causation. 18 Q. (By Mr. Stuemke) Doctor, are you familiar with 19 a method of analyzing human tissue for the presence of 20 asbestos fibers? 21 A. Sure. 22 Q. And is that called a fiber digestion or a 23 tissue digestion? 24 A. That's one way to do it, sure. 25 Q. Okay. And can you basic -- can you briefly	80 1 move to strike his opinions. 2 A. Yeah. Well, the -- that shows that there are a 3 variety of asbestos fiber types in the person's lung, 4 and all of them, we know, cause mesothelioma. And so 5 whatever exposures he had from those asbestos types 6 contributed to the development of the disease. 7 MR. STUEMKE: Very good, Doctor. I pass 8 the witness. Thank you for your time. 9 THE WITNESS: You're welcome. 10 (Discussion off the record.) 11 THE VIDEOGRAPHER: Take a short break. 12 We're off the record at 12:07 p.m. 13 (Break from 12:07 to 12:09.) 14 THE VIDEOGRAPHER: Continuation of tape 15 two. We're back on the record at 12:09 p.m. 16 EXAMINATION 17 BY MR. PUCCI: 18 Q. Dr. Brody, my name's Ben Pucci, and I represent 19 John Crane, Incorporated in this matter. And I've got a 20 few questions to ask you. 21 First, we -- we know you're not a medical 22 doctor, but I just wanted to -- so you're not board 23 certified in any subspecialties of medicine; be it, 24 pathology, radiation, or oncology? 25 A. Right.
79 1 explain to the jury what a fiber digestion study is? 2 A. Right. And -- and I've published several 3 papers like that using this technique. And what we do 4 is you take the tissue. You can either do it as a wet 5 tissue, or you can dry it first. 6 And it's digested using -- usually using a 7 bleach, kind of a chlorine bleach, that reduces the 8 tissue to only what nondestructible minerals are left in 9 the lung, and then you can accumulate those and see 10 what's there. You can count the particles, see what 11 kinds of fibers or particles are actually remain in the 12 lung. 13 Q. Okay. Doctor, I'd like you to assume that 14 there's been a digestion study performed on part of 15 Mr. Voelker's right lung and a lymph node. I'd like you 16 to assume that, in his right lung, amosite fibers and a 17 chrysotile fiber were found, and that -- that in the 18 lymph node, amosite fibers and a tremolite fiber were 19 found. 20 With those assumptions in mind, Doctor, do you 21 have an opinion as to which types of asbestos fiber 22 would have substantially contributed to cause his 23 mesothelioma? 24 MR. PUCCI: I would just object to the 25 hypothetical. If the facts don't bear out, we would	81 1 Q. Okay. And you're not qualified to render any 2 medical diagnoses or give medical examinations; correct? 3 A. Nor would I try. 4 Q. You're not a toxicologist? 5 A. Right. 6 Q. And you are not an epidemiologist? 7 A. True. 8 Q. And you haven't done any research on how fibers 9 are released from any particular products involved in 10 this case? 11 A. Correct. 12 Q. As you stated before, mesothelioma is a 13 dose-response disease? 14 A. Right. 15 Q. And, essentially, that's the -- the dose makes 16 the poison; correct? 17 A. Yeah, sure. 18 Q. Okay. And there are materials used in the 19 world that are helpful at one level but harmful at 20 another; correct? 21 A. I agree. 22 Q. And the body's defense mechanisms are effective 23 at preventing and removing, not only low amounts of 24 dust, but high amounts of dust; correct? 25 A. They do. They're working all the time, sure.

82 1 Q. And previously you've stated, during your 2 testimony, that the body's defense mechanisms can remove 3 about 95 percent of the dust that we breathe in? 4 A. Sure. 5 Q. Okay. And you've said in the past, a substance 6 can be helpful at one level and hazardous at another, 7 include chlorine, arsenic, and even water; correct? 8 A. I'm not sure, but water's not a very good 9 example because, I mean, you know, water doesn't stay 10 around at small levels. We metabolize it. We use it. 11 But it's not a good analogy for asbestos because even 12 small amounts of asbestos are retained in the lung. 13 Q. But the -- the question is, at what dose and in 14 what form do they cause disease; correct? 15 A. That's a question one can ask, of course. 16 Q. And you would agree that that's been studied 17 for asbestos-related diseases for many years, what dose 18 would different fiber types cause disease; correct? 19 A. Well, it's been studied. But, unfortunately, 20 there are really no good answers to that. We -- we 21 don't know just what the dose is because it's so 22 different for different people. 23 Q. And you would also agree that science does not 24 yet know the precise genetic errors that are needed to 25 cause or create mesothelioma?	84 1 environment. The -- the distance is a separate issue. 2 Q. Okay. And those fibers have to be respirable? 3 A. Right. 4 Q. And they have to be the size that are -- that 5 can be breathed in to a person's lungs? 6 A. Correct. 7 Q. And then that person actually has to breathe in 8 those fibers? 9 A. Sure. 10 Q. And they would have to escape what we discussed 11 earlier in your examination of the body's defense 12 mechanisms? 13 A. Not necessarily escape. But, I mean, pass 14 through or be acted on in another time by them. But -- 15 but that's fine. 16 Q. Okay. And they -- as you talked about before, 17 the latency, they have to get to the lungs, and they 18 have to remain in the lungs for a certain amount of 19 time? 20 A. They do, yeah. 21 Q. Okay. And then if some of those fibers do get 22 through all of these defense mechanisms, some may 23 ultimately cause disease? 24 A. That's correct. In a person that has disease, 25 you know that what you just said is true.
83 1 A. Well, that -- that's generally true. I mean, 2 there's a group of errors that we expect to find. 3 But -- but you're right. We -- we can't say just which 4 ones cause the disease in a given individual. 5 Q. That's fair. 6 And since you are the first witness that's 7 likely to testify in this case, I'd like to just go 8 through kind of the elementary steps that one needs to 9 be exposed to an asbestos fiber. Okay? 10 A. That's fine. 11 Q. Okay. First, you have to have a product that 12 contains asbestos; correct? 13 A. Sure. 14 Q. And that product has to release asbestos 15 fibers? 16 A. Right. 17 Q. And they have to become airborne? 18 A. Right. 19 Q. And they have to travel into a person's 20 breathing zone; correct? 21 A. They do. 22 Q. And if you could briefly, what -- what is a 23 person's breathing zone? 24 A. Well, it's -- I mean, it's just an area where 25 you're going to inhale the particles from the	85 1 Q. Would you agree with that animal research does 2 not allow you to determine a particular threshold dose 3 of exposure to chrysotile that would be safe in human 4 beings or create a risk of mesothelioma? 5 A. I agree. And you could say that about any 6 asbestos type; chrysotile or any other type. 7 Q. And there's nothing that we can extrapolate 8 from animal studies to determine a specific dose 9 necessary to cause mesothelioma in humans; correct? 10 A. I agree. Animal studies are not useful for 11 establishing what dose it takes to cause disease in 12 people. I've never used them for that, and I -- I don't 13 really know of any scientist that's tried to do that. 14 Q. Would you agree that there are experts in 15 epidemiology, pathology, and industrial hygiene that are 16 best suited to address the issue of what dose will cause 17 disease? 18 MR. STUEMKE: Object to the form. 19 A. Well, they -- they could address that. I -- I 20 would suggest that -- that nobody's going to tell you 21 what dose is required for a given individual. But -- 22 but sure. Any of those -- any of those disciplines 23 could discuss the issue. 24 Q. (By Mr. Pucci) And you're not here to testify 25 that any gasket or packing products that might have been

86 1 manufactured, sold, or distributed by John Crane, 2 Incorporated exposed the plaintiff to asbestos, are you? 3 A. I did not do that, nor would I plan to do that. 4 Q. And the testimony that you gave can, in no way, 5 be construed by others to have been testimony on that 6 point; correct? 7 A. Well, my testimony is that, whatever the source 8 that produced asbestos that this individual inhaled, 9 participated and -- and was part of the cause of the 10 person's disease. 11 Now, I don't know if it was John Crane 12 products. But if it's proven that it was, then 13 certainly it was a cause. 14 Q. And you're not here to -- to parse out the 15 details of how or where Mr. Voelker was exposed to 16 asbestos? 17 A. That is true. 18 Q. And, in fact, you did not review any materials 19 specific to this case, whether it be the plaintiff's 20 medical records or his testimony? 21 A. Correct. 22 Q. Okay. You've mentioned earlier a little bit 23 about ambient air or the background levels of asbestos 24 in the air around us; correct? 25 A. Right.	88 1 has been shown to cause disease. 2 Q. Okay. And you would agree with me that, 3 previously in trial, that you've testified that you've 4 seen background levels in the ambient air as high as 5 .01 fibers per cc? 6 A. There's a bit of a myth running around, and I'm 7 not sure where that came from. The -- the highest 8 background that I've seen is .001. Okay. 9 Now, if -- if you want to show me a record 10 where I said .01, fine. I -- I think either it was -- 11 either I misspoke or it was transcribed incorrectly 12 because I don't know where .01 background would be. 13 I've -- I've never heard of it. I've never seen it. 14 My testimony is .001. 15 Q. So in -- if you had testified in previous 16 occasions that you actually agree that you -- you had 17 said .01 fibers per cc, you believe that that's not 18 accurate at this time? 19 MR. STUEMKE: I'm just going to object as 20 improper impeachment. 21 A. Yeah. I -- I'm going to say that I don't think 22 it's .01. I -- I just don't remember ever seeing .01. 23 Now, could I have said it? Sure. And would I have been 24 wrong? Yes. 25 I -- I just don't see -- I just don't know
87 1 Q. And you had testified that the -- we all have 2 asbestos in our lungs? 3 A. Small amounts of asbestos in our lungs, that's 4 right. 5 Q. And if one was exposed to just background 6 levels of asbestos, it would not be expected to cause 7 disease -- 8 A. Exactly. 9 Q. -- is that correct? 10 A. That's right. 11 Q. And would you also agree that the measurement 12 of asbestos in the outdoor areas, the background levels, 13 that's a field for industrial hygiene? 14 A. That's what they do, sure. 15 Q. And I'm correct that you don't have any 16 information about what the background levels of asbestos 17 were on the ships Mr. Voelker sailed on in the Navy; 18 correct? 19 A. That's correct. 20 Q. And would you agree with me that the background 21 levels of asbestos vary from location to location? 22 A. Sure. But, I mean, I -- I don't know what they 23 are on ships. But, I mean, from coast to coast across 24 the U.S., they're -- they're variable, but they're low. 25 I mean, I don't know of any background level that really	89 1 where I've ever seen .01. That's -- that's very high. 2 That's a very high background, and -- and I don't know 3 where that would have occurred. .001 would be the one 4 that would make sense. 5 MR. PUCCI: All right. Can we go off the 6 record. 7 THE VIDEOGRAPHER: Take a short break. 8 We're off the record at 12:18. 9 (Break from 12:18 to 12:21.) 10 THE VIDEOGRAPHER: Continuation of tape 11 two. We're back on the record at 12:21. 12 Q. (By Mr. Pucci) Doctor, in the past, you were 13 asked a question, And what is the highest background 14 level that you're comfortable in expressing to me today? 15 And your answer was, I've seen .01 in a couple 16 of places, but that's high. 17 Do you -- do you disagree that you would have 18 made that statement under oath? 19 A. No. I said it under oath, and I'm talking 20 about oath today, so keep reading -- or I'll keep 21 reading because I'm telling you it's .001 that I said I 22 feel more comfortable with that. And if you don't want 23 to read it, I'll read it. 24 Q. And it's fair you're more comfortable with 25 .001, but you have said that you have -- you have seen

90 1 it at levels at .01 fibers per cc? 2 A. No, I didn't -- I think -- I think I misstated 3 that. I think I meant to say .001 -- .001. 4 Q. All right. 5 A. Which is what I said in that transcript. And, 6 I think you ought to read it. 7 MR. STUEMKE: You want to give him the 8 transcript, and he can read it. 9 MR. PUCCI: No. I'm going to just move on. 10 Can we go off the record for a moment. 11 THE VIDEOGRAPHER: Going off the record at 12 12:23 p.m. 13 (Break from 12:23 to 12:24.) 14 THE VIDEOGRAPHER: Continuation of 15 tape two. Back on the record at 12:24 p.m. 16 Q. (By Mr. Pucci) Doctor, I want to now ask you 17 some questions on fiber types. 18 Would you agree that they have -- all the fiber 19 types have different chemical compositions? 20 A. Sure, they do. 21 Q. And they have different shapes, generally? 22 A. Generally, yeah. 23 Q. Okay. And you would agree that the amphiboles 24 have more iron in them than the chrysotile fibers? 25 A. They do. They all have iron, but the	92 1 A. I did. 2 Q. Dr. Andrew Churg is another? 3 A. Yeah. I -- I'm not -- I think you'd need to 4 ask Dr. Churg. I'm not sure what his opinion is. 5 Q. Okay. How about Dr. Roggli? 6 A. Same thing. I mean, I -- I think Dr. Roggli is 7 of the opinion that chrysotile causes mesothelioma, but 8 you'd have to ask him. 9 Q. And, again, you've published with Dr. Roggli? 10 A. Yes. 11 Q. And do you believe that Dr. Crapo also has that 12 opinion that low levels of chrysotile would not cause 13 mesothelioma? 14 A. I think so. 15 Q. And you've -- and you respect Dr. Crapo as a 16 scientist; correct? 17 A. Of course. 18 Q. Now, the studies that you -- you told us about, 19 that you used rats and mice and you caused them to 20 breathe asbestos; correct? 21 A. Yes. 22 Q. And your studies do not simulate low level 23 asbestos exposures in humans; correct? 24 A. True. 25 Q. And not all of your tests or studies, but
91 1 amphiboles have more, that's correct. 2 Q. Do you agree that amphiboles create more 3 oxidation inside the lung than chrysotile fibers? 4 A. Yes. 5 Q. And more oxidation means more genetic errors 6 correct? 7 A. It can, certainly. 8 Q. And the genetic errors are what you believe 9 increases the risk of mesothelioma? 10 A. Well, that's one of them, right. That -- all 11 of the fiber types increase the risk through generation 12 of oxygen radicals, and that may be one of the reasons 13 that the amphiboles, as I stated, are -- are more 14 potent. 15 Q. And do you agree with me that there are 16 researchers that you respect and have worked with that 17 believe that chrysotile does not cause mesothelioma at 18 lower levels? 19 A. There are a few that'll tell you that, sure. 20 Q. Is one of them Dr. Craighead? 21 A. Yes. 22 Q. And you've published with him? 23 A. Yes. 24 Q. And you used a drawing of his in your 25 PowerPoint?	93 1 certainly some of your studies use extremely high 2 concentrations, upwards of 1,000 fibers per cc of pure 3 chrysotile in an aerosol form, continuously exposing the 4 rats that have been bred to predispose -- predisposed to 5 developing disease; is that true? 6 A. Well, in some experiments, yeah. I mean, most 7 of the time they're not predisposed. They're -- they're 8 what we call wild type. In other words, they -- they 9 have a normal genetic makeup. 10 So that -- that's sort of a couple of different 11 questions. Yes, we expose the animals. Some of them 12 are predisposed to getting disease. 13 Q. And, AGAIN, you were using raw chrysotile 14 asbestos -- 15 A. Yeah. 16 Q. -- correct? 17 A. That's right. 18 Q. And these -- these tests or studies that you 19 did caused some cellular reactions in the mice or rats; 20 correct? 21 A. Well, it -- it caused cell reactions. They 22 cause genetic damage. They cause injury. They cause 23 disease. So yes. 24 Q. Do you agree that rats breathing other types of 25 fibers will also cause cellular reactions?

94 1 A. Well, some, but that's not a comparison. I 2 mean, that -- that's not a useful comparison, right. So 3 you have asbestos. You get a series of responses that 4 we've published in the literature. And saying that 5 other fibers cause cellular reactions, that's 6 meaningless. 7 Q. And the fact that cellular reactions may occur, 8 that does not mean they'll turn into mesothelioma; 9 correct? 10 A. Well, certainly, not. 11 Q. And as you've testified on -- on direct, none 12 of the rats that you studied ever developed 13 mesothelioma? 14 A. Because that's the way we designed the 15 experiments. 16 Q. Okay. Are you familiar with other studies on 17 pri- -- that -- on primates -- on primates that have 18 concluded that there are no pathological findings for 19 low dose exposure to chrysotile? 20 A. I -- I've seen -- I don't know what no response 21 means. I didn't look at the animals. 22 Q. Okay. Are you aware of those studies at all? 23 A. I'm not sure which ones you're talking about. 24 Q. Okay. And, Doctor, you've never -- you never 25 have said, in the published literature, that what I	96 1 Q. And are you aware that altering the surface 2 properties of chrysotile can affect how the body 3 responds to that fiber type? 4 A. You need to tell me what you're talking about 5 because altering what? I mean, there -- well, you can 6 alter a lot of things and still have a very toxic 7 particle. So I'm not sure what you're asking me. 8 Q. Okay. That's fair enough. 9 I want to talk a little bit about epidemiology. 10 And you're familiar with that science; correct? 11 A. Of course. 12 Q. And what is epidemiology? 13 A. As I stated, it's the study of populations of 14 individuals where we learn who in that population gets 15 sick and from what. 16 Q. And one epidemiologic -- epidemiological study 17 done of asbestos workers was Dr. Selikoff's insulator 18 cohort? 19 A. Right. 20 Q. And Dr. Selikoff found that 10 percent of the 21 people in his cohort, 17,000-some insulators came down 22 with mesothelioma; correct? 23 A. I'm sorry. Say -- how many again? I'm sorry. 24 Q. 17,000 or about? 25 A. All right. So he -- he -- well, I don't know
95 1 found in rats means X amount of chrysotile can cause 2 mesothelioma; correct? 3 A. Yeah, it's just sort of the same thing you 4 asked me before. In other words, we can't tell how much 5 asbestos causes disease -- it takes to cause disease in 6 people by using the animal experiments. And I agree 7 with that. 8 Q. Okay. And you have never done a study where 9 you were using potential fibers that were -- were 10 released from gaskets or packing products; correct? 11 A. I have not done that. 12 Q. And you have not personally undertaken the 13 study of gaskets and packing specifically? 14 A. I have not. 15 Q. You have not looked at any John Crane products 16 under any sort of magnification, similar -- similar to 17 the magnification you showed the members of the jury 18 earlier? 19 A. I have not. 20 Q. You haven't studied the fiber release levels, 21 if any, from any gasket and packing products? 22 A. That's true. 23 Q. And you've never studied the process by which 24 gaskets or packing are manufactured; correct? 25 A. That is certainly true.	97 1 about the number. But he -- he showed about 10 percent 2 of that population developed mesothelioma. 3 Q. And you knew Dr. Selikoff; correct? 4 A. That's right. 5 Q. He was a world-renowned researcher and scholar 6 on asbestos-related diseases? 7 A. Certainly. 8 Q. And he published some of the ground-breaking 9 studies on asbestos-related disease? 10 A. That's right. 11 Q. And you're aware of his book, Selikoff and Lee, 12 from 1978? 13 A. Sure. 14 Q. And do you -- do you hold that book out to be 15 authoritative and reliable? 16 A. I do. 17 Q. And do you hold Dr. Selikoff and his opinions 18 to be authoritative and reliable as well? 19 A. Sure. 20 Q. Some call him the father of asbestos medicine. 21 Would you agree with that? 22 A. Yes. 23 Q. Okay. Dr. Brody, earlier you told us you have 24 been hired by both plaintiffs and defendants in asbestos 25 litigation; correct?

25 (Pages 94 to 97)

98 1 A. Right. 2 Q. And you've -- you've stated that you've 3 actually been retained and testified on behalf of my 4 client, John Crane, Incorporated? 5 A. Correct. 6 Q. And you said you gave identical testimony in 7 that case, as you did in this proceeding today? 8 A. Correct. 9 Q. Would you agree with me that, in the case that 10 you were retained by my firm and my client, that there 11 was no jury involved? 12 A. Right. It was. 13 Q. And -- 14 A. That's right, it was a judge in court, yeah. 15 Q. And not getting into the specifics of that 16 case, it was not like this proceeding where we have a 17 single plaintiff; correct? 18 MR. STUEMKE: I'm just going to object. I 19 think you're opening the door to something you don't 20 want to go into. 21 MR. PUCCI: Okay. Yeah, I mean -- 22 MR. STUEMKE: But I'd ask you to withdraw 23 the question. 24 MR. PUCCI: Okay. I'll withdraw the 25 question.	100 1 FURTHER EXAMINATION 2 BY MR. STUEMKE: 3 Q. Dr. Brody, just a few quick questions for you. 4 John Crane's counsel asked you about the 5 various substances, including water, that can be helpful 6 to the human body at low doses but dangerous at higher 7 doses. 8 Do you recall that? 9 A. Correct. 10 Q. Is there a dose of asbestos that's helpful to 11 the human body? 12 A. Not that I know of. 13 Q. Okay. Is there a scientific consensus, in your 14 opinion, as to whether low levels -- so-called low 15 levels of exposure to chrysotile asbestos are safe for 16 humans? 17 MR. PUCCI: Object to form. 18 A. Yes, there -- there is a consensus. The -- I 19 mean, any of the government agencies that makes rules 20 about exposures, like the Occupational Safety and Health 21 Administration, the EPA, like that, conclude that 22 there's no known safe level. 23 Q. (By Mr. Stuemke) And you were asked questions 24 about a number of scientists that the jury's never heard 25 of before: Dr. Craighead, Dr. Roggli, Dr. Churn, and
99 1 Q. (By Mr. Pucci) Okay. And you told the ladies 2 and gentlemen of the jury that you're charging five \$550 3 an hour for your time; correct? 4 A. Right. 5 Q. And what -- what year was the first time that 6 you consulted or testified in asbestos litigation? 7 A. I had one case in 1989 and had a few cases 8 after that. 9 Q. Okay. Do you recall, over the years, about how 10 much money that you've made doing this asbestos 11 litigation work? 12 A. Well, all together, it's several-million 13 dollars, I'm sure. 14 Q. Okay. Somewhere between 3 and 4 million? 15 A. Yes. 16 Q. Is that your best estimate? 17 A. Yes. 18 Q. Okay. 19 MR. PUCCI: We can go off the record. I 20 believe that's all I have. 21 THE VIDEOGRAPHER: Go off the record at 22 12:33 p.m. 23 (Break from 12:33 to 12:34.) 24 THE VIDEOGRAPHER: Continuation of tape 25 two. Back on the record at 12:34 p.m.	101 1 Dr. Crapo, and whether their opinions are different from 2 yours about the ability of so-called low levels of 3 chrysotile that cause mesothelioma. 4 Do you recall that? 5 A. Right. 6 Q. Now, it's true that all of those doctors are 7 paid by defendants in asbestos litigation to offer their 8 opinions about the ability of chrysotile to cause 9 mesothelioma; correct? 10 A. That's what I -- 11 MR. PUCCI: Object to form. 12 A. That's what I understand, yes. 13 MR. STUEMKE: All right. No further 14 questions. Thank you very much, Doctor. 15 THE WITNESS: You're welcome. 16 MR. STUEMKE: Do you have anything further? 17 MR. PUCCI: Yeah. Are we still on? 18 THE VIDEOGRAPHER: Yes. 19 FURTHER EXAMINATION 20 BY MR. PUCCI: 21 Q. Doctor, you would agree with me that no 22 organization, expert in asbestos, has stated that 23 background levels of asbestos increased anyone's risk of 24 contracting mesothelioma; correct? 25 A. Correct.

102 1 Q. And are you aware of any epidemiologic studies 2 that show gaskets and packing alone to increase one's 3 risk of mesothelioma? 4 A. I don't know. 5 MR. STUEMKE: Objection. Assumes facts not 6 in evidence. 7 A. I don't know if that's been done. 8 MR. PUCCI: Okay. Thank you, sir. 9 THE WITNESS: You're welcome. 10 MR. STUEMKE: Nothing further. 11 THE VIDEOGRAPHER: We've reached the end of 12 the deposition. We're off the record at 12:36 p.m. 13 (End of proceedings at 12:36.) 14 15 16 17 18 19 20 21 22 23 24 25	104 1 That the witness, ARNOLD R. BRODY, Ph.D., was duly 2 sworn by the officer and that the transcript of the oral 3 deposition is a true record of the testimony given by 4 the witness; 5 I further certify pursuant to FRCP Rule 25 6 30(f)(1) that the signature of the deponent: 7 _____ was requested by the deponent or a 8 party before the completion of the deposition and that 9 the signature is to be before any notary public and 10 returned within 30 days from date of receipt of the 11 transcript. If returned, the attached Changes and 12 Signature Page contains any changes and the reasons 13 therefore: 14 _____x_____ was not requested by the deponent or a 15 party before the completion of the deposition. 16 That pursuant to information given to the deposition 17 officer at the time said testimony was taken, the 18 following includes all parties of record and the amount 19 of time used by each party at the time of the 20 deposition: 21 FOR THE PLAINTIFF: 22 MR. JAY STUEMKE 23 MS. TAERI OH 24 MR. CHARLES SOECHTING, JR. 25 SIMON GREENSTONE PANATIER BARTLETT LLP 3232 McKinney Avenue Suite 610 Dallas, Texas 75204 jstuemke@sgebllaw.com
103 1 SUPREME COURT OF THE STATE OF NEW YORK 2 EIGHTH JUDICIAL DISTRICT 3 In Re: Eighth Judicial District EIGHTH JUDICIAL 4 DISTRICT 5 Asbestos Litigation ASBESTOS LITIGATION 6 7 This document applies to: 8 SUPREME COURT OF THE STATE OF NEW YORK 9 COUNTY OF ERIE 10 11 JANET E. VOELKER, as) Index No. 12 Personal Representative) 801886/2013 13 of the Estate of WILLIAM) 14 R. VOELKER, Deceased, and) 15 Individually as the) 16 Surviving Spouse of) 17 WILLIAM R. VOELKER,) 18) 19 Plaintiff,) 20 VS.) 21) 22 ALFA LAVAL, INC., et al.,) 23) 24 Defendants.) 25 REPORTER'S CERTIFICATION ORAL AND VIDEOTAPED DEPOSITION OF ARNOLD R. BRODY, Ph.D. MAY 8, 2015 I, Dana A. Taylor, Certified Shorthand Reporter in and for the State of Texas, hereby certify to the following:	105 1 toh@sgebllaw.com 2 csoechting@sgebllaw.com 3 (1 hour, 38 minutes) 4 AND 5 MR. JOHN P. COMERFORD (By Telephone) 6 LIPSITZ & PONTERIO, LLC 7 135 Delaware Avenue 8 Fifth Floor 9 Buffalo, New York 14202-2410 10 jpc@lipsitzponterio.com 11 12 FOR THE DEFENDANT JOHN CRANE, INC.: 13 MR. BENJAMIN J. PUCCI 14 O'CONNELL, TIVIN, MILLER & BURNS, L.L.C. 15 135 South LaSalle Street 16 Suite 2300 17 Chicago, Illinois 60603 18 bpucci@otmbllaw.com 19 (0 hours, 21 minutes) 20 21 FOR THE DEFENDANT WARREN PUMPS: 22 MR. DAVID J. GOODEARL (By Telephone) 23 LEADER & BERKON LLP 24 630 Third Avenue 25 New York, New York 10017 dgoodearl@leaderberkon.com (0 hours, 0 minutes) That \$ _____ is the deposition officer's charges to the Plaintiff for preparing the original deposition transcript and any copies of exhibits; I further certify that I am neither counsel for, related to, nor employed by any of the parties or attorneys in the action in which this proceeding was taken, and further that I am not financially or otherwise interested in the outcome of this action.

106	
1 Certified to by me this _____ day of	
2 _____, 2015.	
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4	
5	
6 DANA TAYLOR, Texas CSR 6048	
7 Expiration Date: 12/31/16	
8 Firm No. Dallas: 69	
9 HG Litigation Services	
10 (888)656-DEPO	
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EXHIBIT 4

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MINNESOTA

Case No.: 0:13-CV-02497 (JRT/LIB)

Richard Norman Bodine and Susan Leah Bodine,
individually and as husband and wife,

Plaintiffs,

vs.

3M Company a/k/a Minnesota Mining &
Manufacturing Company, et al.,

Defendants.

TELECONFERENCE DEPOSITION OF

DR. ARNOLD BRODY

NOVEMBER 13, 2014

8:03 a.m.

Mari Skalicky
RPR, RMR
Expiration Date: September 30, 2015
Henjum Goucher Reporting Services
1-888-656-DEPO
1-888-656-3275 Toll Free Fax

Page 2 1 2 IN THE UNITED STATES DISTRICT COURT 3 FOR THE DISTRICT OF MINNESOTA 4 5 ----- 6 Case No.: 0:13-CV-02497 (JRT/LIB) 7 8 Richard Norman Bodine and Susan Leah Bodine, 9 individually and as husband and wife, 10 11 Plaintiffs, 12 13 vs. 14 15 3M Company a/k/a Minnesota Mining & 16 Manufacturing Company, et al., 17 Defendants. 18 ----- 19 20 The following is the teleconference 21 deposition of DR. ARNOLD BRODY taken on behalf 22 of the Defendant IMO Industries, Inc., 23 commencing at 8:00 a.m., on Thursday, 24 NOVEMBER 13, 2014. 25 *****	Page 4 1 FOR THE DEFENDANT AMERICAN BILTRITE, INC.: 2 3 Peter W. Wanning, Esquire 4 Murnane Brandt, PA 5 30 East 7th Street, Suite 3200 6 St. Paul, MN 55101 7 651.227.9411 8 pwanning@murnane.com 9 10 FOR THE DEFENDANT CIRRUS ENTERPRISES, LLC: 11 12 David Scouton, Esquire 13 Foley & Mansfield, PLLP 14 250 Marquette Avenue, Suite 1200 15 Minneapolis, MN 55401 16 612.338.8788 17 dscouton@foleymansfield.com 18 19 20 21 22 23 24 25
Page 3 1 2 A P P E A R A N C E S 3 4 FOR THE PLAINTIFFS: 5 6 Laura Cabutto, Esquire 7 Simon, Greenstone, Panatier, Bartlett 8 3232 McKinney Avenue, Suite 610 9 Dallas, TX 75204 10 214.276.7680 11 lcabutto@sgpblaw.com 12 13 14 15 16 FOR THE DEFENDANT ALCATEL-LUCENT USA., INC.: 17 18 Jonathan P. Parrington, Esquire 19 Pustorino Tilton Parrington & 20 Lindquist 21 6600 France Avenue South, Suite 680 22 Minneapolis, MN 55435 23 952.925.3001 24 jpp@pptplaw.com 25	Page 5 1 2 FOR THE DEFENDANT CYTEC INDUSTRIES, INC.: 3 4 Paul J. Rocheford, Esquire 5 Arthur, Chapman, Kettering, Smetak & 6 Pikala, PA 7 81 South 9th Street, Suite 500 8 Minneapolis, MN 55402 9 612.339.3500 10 pjrocheford@arthurchapman.com 11 12 FOR THE DEFENDANT GEORGIA-PACIFIC, LLC.: 13 14 John C. Hughes, Esquire 15 Meagher & Geer, PLLP 16 33 South 6th Street, Suite 4400 17 Minneapolis, MN 55402 18 612.371.1336 19 jhughes@meagher.com 20 21 22 23 24 25

Page 6 1 2 FOR THE DEFENDANT OGLEBAY NORTON COMPANY: 3 4 Mark J. Peschel, Esquire 5 Johnson & Lindberg, PA 6 7900 International Drive, Suite 960 7 Minneapolis, MN 55425 8 952.851.0700 9 mpeschel@johnsonlindberg.com 10 11 FOR THE DEFENDANT INSUL CO.: 12 Joseph W. Selep, Esquire 13 Zimmer Kunz 14 300 Grant Street, Suite 3000 15 Pittsburg, PA 15219 16 412.281.8000 17 selep@zklaw.com 18 19 20 21 22 23 24 25	Page 8 1 2 INDEX 3 EXHIBITS 4 Exhibit Description 5 No. 1 Notice of Taking 11 6 Deposition 7 No. 2 Dr. Brody report dated 12 8 July 7, 2014 9 No. 3 PowerPoint slides 12 10 No. 4 CV 12 11 No. 5 Dr. Brody list of 13 12 testimony 13 14 15 16 17 18 19 20 21 22 23 24 25
Page 7 1 2 INDEX 3 4 WITNESS: DR. ARNOLD BRODY 5 6 EXAMINATION BY PAGE 7 MR. HUGHES 9, 71 8 MR. PESCHEL.....65 9 10 OBJECTIONS 11 BY MS. CABUTTO: 27, 58, 65, 72 12 13 INSTRUCTIONS NOT TO ANSWER 14 NONE 15 16 DOCUMENT REQUESTS 17 NONE 18 19 20 21 22 23 24 25	Page 9 1 2 3 PROCEEDINGS 4 whereupon, the teleconference deposition of 5 DR. ARNOLD BRODY was commenced at 8:03 a.m. as 6 follows: 7 8 DR. ARNOLD BRODY, 9 after having been first duly sworn, 10 deposes and says under oath as follows: 11 12 *** 13 EXAMINATION 14 15 MR. HUGHES: Good morning, this is 16 John Hughes. Dr. Brody, before I start 17 asking you some questions, I think we've 18 all agreed for the record that the witness 19 can be sworn remotely, and that an 20 objection by one defendant is an objection 21 by all so the court reporter doesn't need 22 to put down a name for objections. Anyone 23 have any other stipulations? 24 MS. CABUTTO: John, it's Laura 25 Cabutto. The only other thing I want to

Page 10	Page 12
1 add to that is an objection by one is an 2 objection to all present. Can we agree to 3 that? 4 MR. HUGHES: That's fine. 5 BY MR. HUGHES: 6 Q. Dr. Brody, this is John Hughes. I'm going 7 to ask you most of the questions today. I 8 want to make sure you hear me okay. 9 A. Just fine. Thanks. 10 Q. Okay. Dr. Brody, you've testified 11 hundreds of times, and I assume that you 12 know the rules for testifying and we don't 13 need to go through those, do we? 14 A. That's fine. I do not. 15 Q. Where are you today, Dr. Brody? 16 A. I'm in my home office in Raleigh, North 17 Carolina. 18 Q. Is anybody with you? 19 A. No. 20 Q. Before I start asking you questions, Dr. 21 Brody, I'm just going to go through some 22 exhibits to mark. The first, Exhibit No. 23 1 is going to be the notice for Dr. 24 Brody's deposition that is dated October 25 10th of 2014.	1 whether we have the most recent version of 2 your resume? 3 A. Yes, that's fine. 4 Q. Okay. Thanks. Then Exhibit No. 5 is a 5 list of Dr. Brody's testimony that's 33 6 pages. Dr. Brody, the one I have, the 7 last testimony is February of 2014. I'm 8 assuming you have either testified at 9 trial or given some depositions between 10 February 25th of 2014 and now? 11 A. I have, yes. 12 Q. Can you give me an estimate of about how 13 many times? 14 A. Oh, about once or twice a month. 15 Q. Could you do me a favor of when we get 16 done, will you just email to Laura your 17 most recent list of testimony? 18 A. Well, I actually don't keep that list, so 19 that's a list that the Simon Greenstone 20 firm concocted, and I'll work with them on 21 getting a more final version. 22 MR. HUGHES: All right. Is that all 23 right, Laura, can you just -- 24 MS. CABUTTO: John, that's fine. 25 He's got a compilation of what we have as
Page 11	Page 13
1 Exhibit No. 2 is going to be Dr. 2 Brody's report in this case, which is 3 dated July 7th of 2014. 4 Exhibit No. 3 are going to be the -- 5 Dr. Brody's slides, which are PowerPoint 6 slides, 24 in number. 7 Exhibit -- I'm sorry, was I on -- 8 did I say 3? So Exhibit 4 is going to be 9 his CV. 10 Dr. Brody, the CV I have, I don't 11 know it has a date, the last -- on the 12 last page, the last publication is No. 55 13 in 2010, and then at the bottom you have 14 something about a book being published. 15 Is that the most recent version of 16 your resume, or is that a -- let me know 17 whether that's the most recent version of 18 your resume. 19 A. That should be fine. The 55 is the last 20 chapter in that section, peer review 21 section goes up to 153 papers, and the 22 book appeared in August. 23 Q. Okay. You're right. I'm sorry. I was 24 just looking -- I'm sorry. Here it is. 25 It's 28 pages. Is that enough to tell you	1 far as what we know. So we'll get a copy 2 of that to you. 3 MR. HUGHES: Okay. And I'm assuming 4 you've got one that has got testimony 5 beyond February of 2014? 6 MS. CABUTTO: I do. 7 BY MR. HUGHES: 8 Q. Those are all the exhibits that I'm going 9 to mark, and I will send them to the court 10 reporter once we're done today. 11 Dr. Brody, when were you first 12 retained in the Bodine case? 13 A. Well, I haven't been retained. I was 14 asked about a week or so ago to find some 15 time to do what we're doing right here. 16 Q. And so at least you haven't really billed 17 any time other than the deposition today 18 on in the file? 19 A. You know, your phone cut out in the middle 20 of that question. I'm assuming you asked 21 me if I billed anything on this case, and 22 the answer is no. 23 Q. And I think on your report your current 24 hourly rate is \$550 an hour? 25 A. That's right.

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1 Q. And the slides that I marked or the 2 24-page slide, that's the PowerPoint that 3 you use when you testify? 4 A. Correct. 5 Q. And at this point you don't plan on adding 6 or subtracting from that group of slides? 7 A. Correct. 8 Q. And you haven't been provided with any 9 materials from the Simon Greenstone firm 10 about Mr. Bodine? 11 A. That's correct. I have not. 12 Q. You haven't seen any deposition testimony 13 of Mr. Bodine? 14 A. I have not. 15 Q. You don't have any information about any 16 of the defendants in the case? 17 A. That's correct. 18 Q. Do you know anything about Mr. Bodine's 19 work history? 20 A. Not at all. 21 Q. Any information about Mr. Bodine's 22 exposure to asbestos? 23 A. No. 24 Q. I take it then, that you've done -- you 25 have not done or haven't seen any	1 there is any objective evidence either by 2 x-ray or any other manner, whether there 3 is objective evidence of substantial 4 asbestos exposure to Mr. Bodine? 5 A. I do not. 6 Q. You haven't talked to Mr. Bodine? 7 A. Correct. 8 Q. I've had the opportunity to look at your 9 transcripts. It's my understanding that 10 you aren't going to be providing specific 11 expert opinions as to Mr. Bodine, am I 12 right about that? 13 A. Well, I mean, I'm going to -- I've been 14 asked to explain how asbestos causes 15 mesothelioma. Now, if that in fact is the 16 disease Mr. Bodine has, the process that I 17 described is what happened to Mr. Bodine 18 and in Mr. Bodine. And I give that 19 opinion. 20 Q. And occasionally I ask -- well, more than 21 occasionally I ask an unartful question. 22 Is it your opinion that all you really 23 need to know is that Mr. Bodine has 24 mesothelioma, and by that fact alone, that 25 it was caused by asbestos?
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1 assessment of Mr. Bodine's exposure to 2 asbestos, if any? 3 A. That is true. 4 Q. You won't be providing any opinions as to 5 any specific defendant in this case? 6 A. Correct. 7 Q. And you won't be providing any opinions 8 that any particular exposure to asbestos 9 was a substantial cause of Mr. Bodine's 10 mesothelioma? 11 A. Well, in the sense my testimony is that 12 all exposures above background contribute 13 to the development of disease, so no 14 particular one is correct. 15 Q. Right. And maybe I can refine the 16 question. We'll talk a little bit more 17 about the cumulative exposures, but you're 18 not going to say, you know, Defendant A 19 was a cause as opposed to Defendant B was 20 a lesser cause, anything like that? 21 A. That's true. I'm not. 22 Q. You haven't seen any medical records or 23 x-rays? 24 A. Correct. 25 Q. Do you have any information about whether	1 A. Well, typically, sure, because those are 2 the kinds of cases that I'm asked to 3 testify in and to assume there has been an 4 exposure, but I know that there are other 5 causes. But in this case, I'm assuming he 6 was exposed to asbestos. And if somebody 7 tells me he wasn't, you know, then we'll 8 change the situation here, but I'm going 9 to explain how asbestos causes 10 mesothelioma. 11 Q. Everybody is exposed to some asbestos, 12 true? 13 A. Sure. Background levels that don't cause 14 disease, that's correct. 15 Q. Do you have a background level that you 16 use? 17 A. Well, there is a range. I mean, I've seen 18 everything from .001 on the high side to 19 four or five zeros, so there is quite a 20 range. 21 Q. As you sit here today, you don't know the 22 range of exposures that Mr. Bodine may 23 have been subjected to? 24 A. That's correct, I do not. 25 Q. My understanding is that your testimony is

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1 about how asbestos fibers cause damage to 2 cells and DNA and genes. I know that's a 3 mouthful, but is that essentially it? 4 A. Yeah. That's essentially it, that's 5 right, and how that damage translates to 6 the disease that is discussed here, can be 7 mesothelioma or I can explain how asbestos 8 causes any of the diseases. 9 Q. And it's my understanding that your 10 opinion is that there are -- that asbestos 11 fibers can hit target cells and that DNA 12 and genes are altered or that there are 13 errors that cause them to be altered that 14 starts the disease process, am I right 15 about that? 16 A. Yes. That's correct. 17 Q. But if we start at the beginning, every 18 breath that someone takes where they might 19 be exposed to some asbestos doesn't make 20 it to those, what you call the target 21 cells, does it? 22 A. I'm not sure what you're asking me. So 23 when there is an environment where there 24 are asbestos fibers, and if we're talking 25 about the background, it's certainly true.	1 Q. Right. And I'm not going to -- we're not 2 going to go through all of that. I know 3 that you've talked about those before. 4 Once fibers get to the lung, there 5 are also ways that the lung removes some 6 of those fibers, true? 7 A. Yeah, exactly. And in a person who has 8 the disease, it's clear that this fight, 9 our outstanding defense mechanisms, they 10 didn't remove sufficient fibers to prevent 11 the disease. 12 Q. Is there a certain percentage of 13 mesotheliomas that are not caused by 14 asbestos? 15 A. Right. There is a small percent, a few 16 cases, about 10 percent or so have no 17 record of exposure, no evidence of any 18 exposure. And those would be called 19 idiopathic, meaning you don't know the 20 cause. There are a few cases caused by 21 radiation, that is, high-energy radiation 22 to the chest wall. There may be a few 23 cases that are spontaneous. Any kind of 24 cancer can develop without any outside 25 influence. So those would make up the
Page 19	Page 21
1 I mean, there aren't sufficient fibers in 2 a typical background inhalation where a 3 fiber is rare, versus an occupational 4 setting or an environmental setting where 5 there are many fibers above background, 6 and some proportion of those is much more 7 likely to reach the target zone. So this 8 is the dose response issue that you're 9 asking me about. 10 Q. Yeah, and actually the word you used is 11 better. Only a certain percentage or 12 proportion of the fibers that they're 13 exposed to, and let's assume for this 14 question it's an occupational exposure, so 15 it's somebody in a trade or something that 16 has got occupational exposure. Whatever 17 exposure they have or whatever they 18 inhale, only a certain percentage of those 19 make it into the lung, true? 20 A. True. 21 Q. Because there are defense mechanisms that 22 help remove some of those fibers before 23 they get to the lung? 24 A. Yeah, of course, and I'll explain those in 25 detail.	1 approximately 10 percent. 2 Q. And what is the basis for the 10 percent? 3 A. Oh, that's an epidemiologic finding. I 4 mean, you can look at a whole series of 5 epidemiology that's -- I mean, anywhere 6 from 85 percent to 95 percent, but it 7 really depends on whose epidemiology 8 you're looking at. 9 Q. As a general proposition, you recognize -- 10 I'm sorry. Let me start over. You 11 recognize the proposition that a certain 12 percentage of mesotheliomas may be 13 spontaneous or idiopathic or not caused by 14 asbestos? 15 A. Yeah, of course, but in a case where there 16 is an established asbestos exposure, it's 17 not very useful or helpful to be talking 18 about idiopathic or spontaneous. 19 Q. Do you have any classification of what you 20 would call an established asbestos 21 exposure? 22 A. Oh, I'm talking about an exposure that is 23 known to be above background either at an 24 occupational setting or an environmental 25 setting where there is asbestos trade

Page 22 1 nearby, you know, or bystander kind of 2 exposure, that sort of thing, any of 3 those. 4 Q. There are -- most people who have been 5 occupationally exposed to asbestos do not 6 get mesothelioma, is that fair? 7 A. Of course. I mean, I make sure that the 8 jury understands that most people no 9 matter how much they're exposed do not get 10 mesothelioma. 11 Q. And it's a fairly rare disease? 12 A. Absolutely. 13 Q. And so if we take the whole heart of 14 occupationally exposed people, there is a 15 subset where fibers have gotten to what 16 you have called the target cells and 17 altered the DNA or altered genes and then 18 start the disease process, is that 19 accurate? 20 A. That's correct. 21 Q. So within that subset of people where 22 fibers have hit the target cells and start 23 altering DNA, is there any quantification 24 of fibers that are required to start 25 altering DNA or altering genes?	Page 24 1 Q. And I think, is the right phrase genetic 2 susceptibility, is that a phrase you would 3 use to describe what we're talking about? 4 A. Absolutely. 5 Q. And what I was trying to find out was, in 6 the group that has genetic susceptibility, 7 whatever that group is, whatever the 8 quantity of fibers or the amount of errors 9 or hits on the target cell, we don't know 10 that, and it's more likely than not that 11 those are different among the subset of 12 people that are genetically susceptible, 13 is that true? 14 A. Yeah. That is true. Sure. 15 Q. I want to ask you just a minute about 16 radiation. It sounds like you agree that 17 radiation can cause mesothelioma? 18 A. Well, if it's high dose collimated 19 radiation to the chest wall, that has been 20 shown to cause some cases of mesothelioma. 21 But general radiation, no. 22 Q. What is the difference there? Well, 23 before I ask that, did you say culminated 24 radiation? 25 A. I said collimated, C O L L I M A T E D.
Page 23 1 A. Yeah, that's a good question. I don't 2 think anybody can tell you that they know 3 what that number is. I mean, what we do 4 know is that a single fiber can bind DNA 5 and cause genetic damage. Now, in order 6 for that to happen a sufficient number of 7 times to make a difference and to increase 8 the likelihood of genetic damage resulting 9 in a cancer, you need to have those events 10 repeated over and over again. And but 11 your question, just how many it takes is 12 really not clear. 13 Q. Is it more likely than not that that 14 number would be different for those 15 individuals in the subset of people where 16 fibers start altering DNA or genes? 17 A. Okay. So what you're asking me is 18 susceptibility. What controls 19 susceptibility, so obviously a person who 20 is susceptible requires fewer fibers than 21 the next person who will not get the 22 disease no matter how much they're exposed 23 to it. So those are the two ends of the 24 spectrum. And in there is a group of 25 susceptible individuals.	Page 25 1 That means a focused column of x-rays. 2 Q. Everybody is exposed to some radiation, 3 true? 4 A. Sure. 5 Q. Even cigarette smokers are, there is 6 radiation in cigarettes? 7 A. Oh, yeah, that's a very special case. 8 There is polonium in cigarette smoke and 9 that could easily be one of the factors 10 producing genetic errors in the airways of 11 cigarette smokers, sure. 12 Q. That could lead to mesothelioma? 13 A. No, not at all. Lung cancer is what we're 14 talking about. When we talk about 15 cigarette smoke, we're talking about lung 16 cancer, not mesothelioma. 17 Q. No, I understand that. I was asking more 18 about radiation. Other groups that are -- 19 air flight, pilots are exposed to 20 radiation? 21 A. Sure. And cigarette smokers and pilots 22 and people who fly airplanes don't get 23 mesotheliomas above, you know, background 24 rates. So that's what I mean by general 25 radiation. And I'm sorry if I

Page 26 1 misunderstood. You're asking me if 2 cigarette smokers are exposed to 3 radiation, so I told you about polonium, 4 and that would relate to lung cancer so 5 I'm sorry if I misunderstood that. 6 Q. No, that's okay. Here's what I'm driving 7 at. If an airline pilot or a cigarette 8 smoker or a cigarette-smoking airline 9 pilot has this focused radiation, can I 10 use -- what word can I use to describe 11 what you were talking about, the radiation 12 that can cause mesothelioma? Focused 13 radiation, is that the right term? 14 A. Well, yeah, that as a result of 15 therapeutic radiation, in other words, any 16 clinic where somebody is being treated for 17 a cancer is the most typical use. 18 The physicians will use a focused 19 beam of radiation on that tumor, and that 20 has caused mesotheliomas when you have a 21 focused beam of high-energy radiation. 22 And that is versus the kind of radiation 23 that you're talking about in airline 24 pilots or somebody who just walking around 25 in the environment would get.	Page 28 1 what causes the cumulative source. 2 BY MR. HUGHES: 3 Q. But there are certainly people who are 4 exposed to asbestos and occupationally 5 exposed to asbestos who don't get 6 mesothelioma, right? 7 A. Well, most don't as we've discussed, sure. 8 Q. Right. And actually most people who are 9 exposed to radiation don't get 10 mesothelioma? 11 A. Of course. 12 Q. Is it the same if we're talking about 13 therapeutic radiation, is it the same 14 process that something in the radiation 15 gets to target cells and starts altering 16 DNA or genetic material? 17 A. Exactly. 18 Q. So the same is true is there is a subset 19 of people who get the therapeutic 20 radiation who for whatever reason are more 21 genetically susceptible? 22 A. Absolutely. Same thing. 23 Q. Right. People would have had radiation 24 exposure outside of the therapeutic 25 radiation?
Page 27 1 Q. Let's use the term therapeutic radiation, 2 fair enough? 3 A. Sure. 4 Q. If someone who has been subjected to 5 therapeutic radiation develops 6 mesothelioma, is the other forms of 7 radiation -- is that cumulative with the 8 other forms of radiation that they've been 9 exposed to in their life? Is all of that 10 radiation then causative of the 11 mesothelioma? 12 MS. CABUTTO: Objection as to form. 13 A. No, I don't think so. The reason is 14 because the kind of radiation that we -- 15 that everybody gets on a daily basis as 16 far as we know does not cause cancer, 17 certainly mesothelioma. So -- and we know 18 that a collimated source does, but if you 19 look at other kinds of carcinogens and you 20 ask, well, does this dose of carcinogen or 21 a second dose of asbestos as a carcinogen, 22 for example, or arsenic as a carcinogen, 23 would that level in and of itself cause a 24 mesothelioma or cause a cancer. And if 25 the answer is yes, yes, yes, then that is	Page 29 1 A. Yeah, but not at levels that would cause a 2 cancer. 3 Q. But the same would be true for somebody 4 who may have had some asbestos exposure 5 before the disease process started, didn't 6 they? 7 A. Well, I don't -- you know, if you have a 8 level of asbestos exposure above 9 background for, you know, weeks, months, 10 whatever, it could be a brief exposure, 11 that my opinion is enough to cause genetic 12 errors and start a disease process. 13 Now, every exposure above background 14 to asbestos is a part of the causative 15 chain of events that leads to the 16 development of a tumor. Now, we're not 17 talking about the same thing when we're 18 talking about radiation from the 19 background or other sources of radiation, 20 so I think that's where we're talking 21 about two different things. 22 Q. Well, why is it that the background 23 radiation wouldn't -- that cumulative 24 amount wouldn't be causative, but the 25 cumulative amount of asbestos would be in

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1 your opinion? 2 A. Yeah, okay. So let's say that you give me 3 your -- anybody a scenario where they say 4 a person is exposed to asbestos at a work 5 site for eight weeks and they, 30 years 6 later, they develop a mesothelioma and 7 there is no other apparent exposure. Is 8 that a cause? Yes, I would say, sure, 9 that's a cause. There is no way you could 10 say that it did not cause the 11 mesothelioma. That's -- and then, 12 however, you go back and you look at that 13 person's exposure, he's got five other 14 kinds of exposures not very different than 15 that. And then you see the mesothelioma. 16 Well, did they all contribute? Sure, they 17 did. 18 Now, start again with the first 19 person who gets radiation, and you ask, 20 well, he lived in this town for 10 years, 21 he lived in another town for 20 years, and 22 then he went in to get therapeutic 23 radiation of his chest wall and he got a 24 mesothelioma. 25 Nobody is going to say or could say,	1 the person that now has the disease 2 process start, right? 3 A. You're asking me about asbestos? 4 Q. It was a bad question. Yeah, I apologize 5 for interrupting. Let me ask the question 6 again. 7 I'm having trouble understanding the 8 differences between radiation and asbestos 9 exposure. Why is it that you separate out 10 the background in radiation but you're not 11 doing it in asbestos exposure? 12 A. Well, I am, because background in asbestos 13 exposure doesn't cause mesothelioma. And 14 if all you're exposed to is background 15 asbestos, then I'm not going to say that 16 that caused -- I don't think anybody would 17 say that that causes mesothelioma. If all 18 one is exposed to is background radiation, 19 that's not going to cause it. 20 Now, what -- somebody has a 21 mesothelioma, and all they're exposed to 22 is high-energy radiation, there is the 23 cause. They're exposed. If all they're 24 exposed to is asbestos occupationally, 25 there is the cause. If they're exposed to
Page 31	Page 33
1 that the background -- there is no way 2 that that causes any cancers. 3 Q. Doctor, I'm sorry, you're going to have to 4 start your answer over because you cut 5 out. 6 A. Am I going to have to start that whole 7 thing over again? 8 MS. CABUTTO: Dr. Brody, it barely 9 cut out for the last 10 or 12 seconds 10 there. 11 A. So did you, Laura. 12 Q. Everybody is cutting out. 13 A. That's wonderful. How about if the court 14 reporter let's me know where I was last. 15 (Record read back.) 16 A. Okay. Here we go. No one could say that 17 that background radiation contributed 18 because the background alone doesn't cause 19 the mesothelioma. It's the therapeutic 20 radiation that is known to cause it, and 21 that is the difference between those kinds 22 of exposures that you're asking me about. 23 BY MR. HUGHES: 24 Q. But the background doesn't cause the 25 mesothelioma in any other group other than	1 both high-energy radiation and asbestos, 2 they contribute. 3 Q. Right. And I wasn't trying to ask about 4 synergy. 5 A. And I'm sorry to interrupt you. I wasn't 6 intending to talk about it either. I'm 7 just giving you the scenario I think that 8 you're asking me for. 9 Q. Okay. And I'm actually trying to kind of 10 separate them because I think you've had a 11 similar example. If we take your example 12 of somebody who had the -- I think you 13 said if you had somebody who had eight 14 weeks of exposure and 30 years later they 15 developed mesothelioma, a couple answers 16 ago you started out with that. Do you 17 remember that? 18 A. Sure. 19 Q. Okay. So if the person who has the eight 20 weeks of exposure 30 years later develops 21 mesothelioma, and prior to that eight 22 weeks of exposures walks through a garage 23 where there is brake work going on or 24 friction work going on, I think you would 25 tell me that that contributed to his

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1 mesothelioma? 2 A. I think you're putting words in my mouth. 3 I wouldn't say that walking through a 4 passive brake job contributes. I would 5 never say that. 6 My testimony is that you have to be 7 exposed days, weeks, typically months or 8 more for that to be a contributing factor. 9 So walking through doesn't mean anything 10 to me. 11 Q. Let me try it differently. I didn't mean 12 to put words in your mouth. But let's 13 assume that the going through the garage 14 where there is friction work going on, 15 that there is a documented exposure of 16 asbestos there, however minimal that might 17 be. And then we have your eight weeks of 18 exposure, working at a summer part-time 19 job, whatever. And then 30 years later 20 develops mesothelioma. 21 In that scenario, now that the person 22 has mesothelioma, would your view be that 23 if we document that exposure in the 24 walking through the garage where the 25 friction work is going on, that that would	1 generates oxygen radicals that also damage 2 the DNA. These are the high-energy 3 compounds that we know damage DNA, and all 4 the asbestos varieties generate oxygen 5 radicals. 6 Now, radiation damages DNA through 7 primarily the second mechanism that is the 8 generation of oxygen radicals. So it's a 9 very potent inducer of reactive oxygen 10 species and, therefore, is a carcinogen 11 because it does so. 12 Now, both carcinogens produce this 13 cumulative effect. Every time you're 14 exposed to asbestos in sufficient numbers 15 that a percentage reach the target site 16 and can cause the generation of reactive 17 oxygen species and bind DNA, you have a 18 cumulative effect. 19 It's the same thing with radiation. 20 If you have sufficient radiation to damage 21 DNA, then you have a cumulative effect. 22 Every time you're exposed, you can develop 23 sufficient genetic errors. 24 Now, those kinds of errors apparently 25 don't occur just from background radiation
Page 35	Page 37
1 be cumulative or part of the cause of the 2 mesothelioma? 3 A. Well, my testimony has been consistent on 4 requiring days at the minimum in a 5 setting, whether it's a garage or anywhere 6 else. So multiple days in a setting where 7 we know that there are exposures above 8 background, that would contribute. So the 9 walk-through, I wouldn't say contributes 10 and it never has. 11 Q. Okay. What is the difference between 12 radiation and asbestos exposure that at 13 least leads you to give me at least what I 14 think are different answers in terms of 15 cumulative exposures? 16 A. Well, it's some aspects of it are 17 different, but others are the same. So 18 let me answer your first question first 19 and then your point that you're making. 20 The first question is: asbestos 21 causes cancer, mesothelioma by two 22 mechanisms that we know, and that's 23 binding DNA; in other words, it physically 24 interrupts the division of the cell by 25 physically binding DNA; and, secondly, it	1 sufficient to cause a cancer. 2 Q. But isn't the same true of asbestos 3 exposure, that the background isn't 4 sufficient to cause mesothelioma? 5 A. That's true. We're agreeing on that. 6 Maybe -- I'm not sure -- I'm not sure 7 where our misunderstanding is here. You 8 know, background asbestos is not enough to 9 cause mesothelioma. Background radiation 10 is not enough to cause mesothelioma. 11 Q. And just a couple more questions and then 12 I'll leave this, but the person who -- and 13 I think it's your -- in terms of radiation 14 it has to be therapeutic radiation to the 15 chest wall before you would say that 16 that's a cause of mesothelioma, exclude 17 asbestos exposures and all of that other 18 stuff, right? 19 A. Right. 20 Q. And my question was, then are all of those 21 other radiation exposures cumulative, is 22 there any other radiation exposure a cause 23 of the mesothelioma? 24 A. High-energy exposures, sure. 25 Q. Is high energy the same thing as radiation

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1 therapy? 2 A. Yes. 3 Q. How about other radiation that we're 4 exposed to, air flight, whatever, x-rays, 5 any of that? 6 A. Right, and we've been through that. And 7 my answer is that those would not be 8 sufficient in and of themselves to cause 9 the mesothelioma so would not contribute, 10 just as background asbestos would not in 11 and of itself be sufficient to cause 12 mesothelioma. So I wouldn't expect it 13 then to -- I wouldn't call it a 14 contributing factor. 15 Q. I just want to talk about fiber potency 16 for just a moment. Do you agree that at 17 least amphiboles versus chrysotiles, that 18 there are differences in potency for 19 causing disease? 20 A. There are. The amphiboles are more potent 21 on a fiber-per-fiber basis, but I don't 22 think we know by how much. I mean, those 23 numbers are changing pretty constantly. 24 Q. You're aware that there is at 25 least academic dispute about whether	1 paper in 2011, where he did a 2 meta-analysis of a whole series of 3 studies, asking whether or not chrysotile 4 causes mesothelioma, and it clearly does. 5 And so does the -- all of the agencies 6 that ask that question have concluded that 7 chrysotile causes mesothelioma. The 8 Helsinki report from years ago says that 9 it does. You know, are there a few people 10 who say it doesn't? Sure, but I don't 11 think there is a big debate out there. 12 Q. I just wanted to go back for a minute. 13 You were telling me earlier about kind of 14 the disease process, and you were talking 15 about asbestos binding DNA or giving off 16 oxygen-free radicals. Do you remember 17 that? 18 A. Sure. 19 Q. That's not only mesothelioma, that's the 20 process that a lot of carcinogens start 21 the disease process, true? 22 A. Well, the oxygen radical production, 23 absolutely. Asbestos is not unique 24 essentially, but among carcinogens there 25 are very few like asbestos that can
Page 39	Page 41
1 chrysotile in and of itself can be 2 causative of mesothelioma? 3 A. I don't think there is much of a dispute. 4 I mean, I think you can find a few people 5 whose opinions I typically agree with. 6 You'll find a few of those folks that tell 7 you that chrysotile doesn't cause 8 mesothelioma, but the consensus of the 9 scientific community and the writing, the 10 scientific writing largely says that 11 chrysotile causes mesothelioma. Certainly 12 the epidemiology is very clear that 13 chrysotile causes mesothelioma, but 14 dispute seems to be in a courtroom because 15 there are a few experts who say it 16 doesn't. 17 Q. Well, I mean, there are people who have 18 written peer-reviewed articles making the 19 case that chrysotile doesn't cause 20 mesothelioma? 21 A. There are some, but I mean, if you look at 22 the -- if you look at the epidemiology and 23 you look at their reports of the 24 Associated Societies of Epidemiology, I 25 mean, you know, Martin Konarik wrote a	1 actually bind DNA in a solid state way. 2 And that's one of the reasons that it's 3 such a potent carcinogen, all of the 4 asbestos varieties. 5 Q. I'm sorry. I didn't -- let me ask a 6 broader question. The process that a 7 carcinogen -- or let me start over. 8 Let me start over if I can. I want 9 to ask a broader question. Your general 10 testimony about fibers getting to cells 11 and altering DNA or making, causing errors 12 that lead to the disease process and that, 13 that's a similar process for a lot of 14 carcinogens, true? 15 A. Yes. The general concept of genetic 16 damage is the central dogma for producing 17 cancer in general, yes. 18 Q. It's not unique to asbestos exposure and 19 mesothelioma? 20 A. Well, that was the nature of my answer 21 initially was that asbestos is -- it's not 22 unique, does do things that most 23 carcinogens do not, and that is as a solid 24 state agent, it binds DNA. 25 So as a general principle, the

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1 generation of oxygen radicals and the 2 production of genetic damage is central, 3 but asbestos can do it also by binding DNA 4 and interfering physically with the 5 chromosomal DNA as the cell is dividing. 6 Q. Okay. But the general process, if I can 7 use that term, isn't unique to asbestos 8 exposure and mesothelioma, there is a 9 similar process from cigarette smoking and 10 lung cancer? 11 A. If your question includes the formation of 12 genetic damage and errors to genes that 13 control cell growth, the answer is yes. 14 When you start comparing how asbestos does 15 that with the other agents that cause 16 cancer, then it has to be qualified as I 17 did. 18 Q. Yes. And my question is more to the first 19 part of your answer. That's what I was 20 getting at; that's all. 21 A. That's fine. 22 Q. Thanks. Do you have any lowest range of 23 exposure that can cause mesothelioma? 24 A. Well, I mean, I don't, but you know, 25 epidemiologists talk about low exposures,	1 to establish cause. 2 Q. And you rely on epidemiological studies 3 for some of the opinions that you give or 4 some of the testimony that you give? 5 A. Right. I don't do -- I'm not an 6 epidemiologist by any means and don't do 7 those kinds of studies, but epidemiology 8 tells you where the problems are in 9 society and what needs to be studied. 10 Q. Are you aware of any epidemiological 11 studies on people who have worked in the 12 aviation industry and whether there is a 13 higher incidence of mesothelioma among 14 that group? 15 A. I don't know. I'm not saying there aren't 16 any. I'm just saying I'm not familiar 17 with that. 18 Q. The report that I had marked, I think as 19 Exhibit 2, I think you have referred to 20 that report before as your generic report. 21 Is that a fair term that you've used to 22 refer to that? 23 A. Yeah. 24 Q. And I've seen other ones in other cases, 25 and it's the same or similar to the report
Page 43	Page 45
1 low dose, brief exposures and, you know, I 2 would go to the literature on those. And 3 some people have shown, you know, days, 4 weeks, months, I don't have any particular 5 cases off the top of my head, but you can 6 go to the literature and find those, what 7 they call low dose, quote unquote, brief 8 exposures, but I don't have a number, no. 9 I'm sorry. That relates to 10 susceptibility. You know, if a person is 11 highly susceptible, it obviously is going 12 to take less exposure. 13 Q. And within that genetic susceptibility, we 14 don't know what that quantity is? 15 A. I agree. 16 Q. Give me one second. I lost my place. 17 Oh, you and I have talked a little 18 bit about epidemiology. That's 19 essentially the gold standard that 20 epidemiologists use to determine causes of 21 disease, true? 22 A. Sure. That's why you have these 23 societies, like the Society of 24 Epidemiology, American Thoracic Society, 25 all these societies that use epidemiology	1 that we've marked in this case? 2 A. Yes. 3 Q. Towards the end of the report, I'm just 4 going to read the sentence instead of 5 trying to formulate the question. This is 6 on page 21 of this report. "Once a person 7 develops an asbestos-related cancer, it is 8 not possible to exclude any one" -- I'm 9 sorry, let me start over. "Once a person 10 develops an asbestos-related cancer, it is 11 not possible to exclude any of the 12 person's above-background exposures to 13 asbestos from the causal chain. Each and 14 every exposure to asbestos that an 15 individual with mesothelioma experienced 16 in excess of a background level 17 contributes to the development of a 18 disease." Did I read that accurately? 19 A. Sure. That's what we've been talking 20 about. 21 Q. Yes. Can we use the term each and every 22 fiber theory? Do you and I -- is that 23 fair to characterize the sentence I just 24 read? 25 A. Well, I'm not sure what you mean by each

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1 and every fiber theory. Please go ahead. 2 Q. Let me define it a different way to ask 3 the question. Let me try it this way: 4 The sentence that I just read, at least in 5 that testimony of what you say on that 6 point hasn't ever been scientifically 7 tested, has it? 8 A. Well, it's not tested because it's a known 9 concept; in other words, look at any 10 cancer and ask what caused it. And you go 11 back and you look at the kinds of 12 exposures people have. Do you think -- 13 one certainly cannot in a lung cancer 14 exclude any of the brands of cigarettes or 15 any of the cartons of cigarettes that that 16 person inhaled over the decades. You 17 can't exclude any of those. If a person 18 is drinking water laced with arsenic and 19 gets GI cancer, you can't go back and ask 20 which drink of water did that. It 21 wouldn't be a scientific concept that one 22 would try to test and is no different with 23 asbestos exposure in every time a person 24 is exposed it increases the number of 25 fibers that reach the target cells and	1 and the fact that nobody has carried out a 2 study and tried to exclude exposures, I 3 think speaks to that issue. No one has 4 done that because it wouldn't make any 5 sense to try to do that. 6 Q. Is the answer to my question that it's 7 correct, it isn't that each and every 8 exposure above background at least is not 9 supported by data? 10 A. No. I think that's incorrect because it 11 is supported. It's supported by what we 12 know about dose response. Every time you 13 add an agent, as I've already said a 14 couple times now, you increase the 15 likelihood. Now, which of those would you 16 like -- would you think you can eliminate? 17 I don't know how you do that. Nobody has 18 tried to do that because that's not the 19 way carcinogens work. So, you know, I've 20 been asked this question now probably for 21 the last ten years. My answer has been 22 the same every time. I've not seen 23 anybody demonstrate how you can exclude an 24 agent in the chain of exposure and its 25 ability to cause a cancer. It just
Page 47	Page 49
1 contributes to the development of the 2 disease. There is no way to exclude any 3 of those either. There is nothing 4 different in that regard about asbestos 5 versus other known carcinogens. 6 Q. I think in the past you called that 7 intuitive, is that right? 8 A. Yeah. Intuitive might sound like I'm 9 brushing it aside, but I mean, it's an 10 important issue. And when you go through 11 the scenario I just gave you with 12 different carcinogens, it should be 13 intuitive. 14 Q. It's not something that is supported by 15 any data? 16 A. Well, it's supported by all the data that 17 show what causes cancer. Every time you 18 increase the dose of any carcinogen, you 19 increase the likelihood of development of 20 a cancer. Now if that isn't contribution, 21 I don't know what is. I mean, go through 22 a series of exposures of any kind of 23 carcinogen, and you get the scenario that 24 I stated. 25 The fact that nobody has written that	1 doesn't make any sense to me. 2 Q. But let me try it this way. I'm just 3 going to -- this is from a transcript from 4 2010. It's a case called Baxter versus 5 Al- --. Let me just read the question and 6 your answer and see if this is still your 7 testimony. "In fact, there are no data 8 that establish the concept that all 9 exposures contribute to cause 10 mesothelioma, such that it would allow 11 that concept to be published in the peer 12 review medical literature correct." Now, 13 to be fair, I understand this is a 14 slightly different question than I asked, 15 but here was your answer: "As I say, that 16 is not something that can be tested. 17 That's intuitive. It's one that 18 scientists would draw as I have and others 19 have drawn opinions based on what we know 20 about what fibers do and what they can 21 do." Is that accurate, did I -- 22 A. Yeah, that's fine. That's fine. If you 23 combine that with the answer I just gave 24 you, then we'll have a complete opinion on 25 that.

Page 50 1 Q. But the fact is there isn't data, I 2 understand you've explained to me why 3 there isn't, but my only question is 4 whether there is any data that supports 5 your testimony that every exposure above 6 background contributes to the 7 mesothelioma. 8 A. Right. So I think if you, in the sense 9 that if you go to the literature and you 10 try to find a paper that says that there 11 aren't data, which is why I answered the 12 question that way, but I think today just 13 a few minutes ago, I explained why there 14 are no data. You really don't need to 15 generate data like that. You need to just 16 understand how carcinogens work, 17 particularly related to the dose effect. 18 Every time you add a carcinogen, you 19 increase the likelihood of these events 20 occurring. And there is no way to know if 21 you could take any of them out and change 22 the scenario of development of a cancer. 23 Q. The concept that every exposure above 24 background contributes to mesothelioma 25 hasn't been published in the peer review	Page 52 1 but at least the each and every exposure 2 above-background theory hasn't been put 3 together as a scientific principle and 4 tested for the reasons you just explained 5 to me? 6 A. For the reasons I've explained, yes. 7 Q. Sure. Let me just ask one other question 8 before I forget and then we can take a 9 quick break. I don't want to ask a lot of 10 questions about it, but you've done animal 11 experiments, rats and mice experiments and 12 asbestos exposure? 13 A. Yeah, of course. That's what most of the 14 papers on my CV are all about. 15 Q. Right. And at least throughout that, have 16 you done any testing with the rats and 17 mice such that you've induced mesothelioma 18 in those tests? 19 A. No. We've not designed our experiments to 20 do that. I mean, the scientists that have 21 done that over the years showed us that 22 you need to expose the animals throughout 23 their life span, their short life span and 24 then just like in people, a few of the 25 animals at the end of their life span get
Page 51 1 literature, right? 2 A. Yeah, it's the same answer, right. It's 3 not -- it's not the kind of set of 4 experiments that scientists would do. And 5 as I think I already said, that's why you 6 haven't seen it in the peer-reviewed 7 literature because when a scientist 8 carries out a series of experiments where 9 they expose animals or they expose cells 10 or they're doing the kinds of experiments 11 that lead to a cancer, they're not trying 12 to pick out the ones, the exposures that 13 do it and the ones that don't because that 14 wouldn't make any sense. That wouldn't be 15 a good experiment. What caused the cancer 16 was the carcinogen that was added by the 17 individuals over the course of the 18 experiment and, you know, when you look at 19 those experiments, that's the way that's 20 done, it's not trying to pick it apart and 21 see which exposure did and which one 22 didn't. I'm sorry. That's why you don't 23 see it in the literature that way. 24 Q. Okay. And I apologize for interrupting. 25 Maybe this is what you've been telling me,	Page 53 1 mesothelioma. So, I mean, that's not -- 2 they're not easy experiments to do. 3 They're not ones that we decided to do. 4 What we're doing is setting up brief 5 exposures to start the process, not to 6 bring animals to the clinic with 7 mesothelioma. We never designed our 8 experiments to do that. 9 Q. Okay. This is a good time to take a 10 break. I've got 9:01. So why don't we 11 come back at ten after the hour. 12 (A brief recess was taken.) 13 BY MR. HUGHES: 14 Q. I've just got a few more questions, Dr. 15 Brody. Have you looked at any other 16 reports of experts in this case? 17 A. No. 18 Q. I think I asked this question, but are you 19 aware of any studies on fiber release from 20 aviation products? 21 A. No. 22 Q. That's not really your area, right, that 23 would be for industrial hygienists? 24 A. Correct. 25 Q. Have you changed any of your basic

Page 54 1 testimony over the years? 2 A. I don't believe so. 3 Q. If someone has no objective markers of 4 asbestos exposure, whether it's by 5 ingestion study that shows a below 6 background or minimal fibers or there 7 aren't pleural plaques and radiology, does 8 that mean anything to you in a person who 9 has mesothelioma? 10 A. Well, it means they might have had a lower 11 dose but the Helsinki criteria are quite 12 clear that the -- that for attribution in 13 a mesothelioma, you need to have a history 14 of asbestos exposure for attribution. So 15 I mean, that seems to be the consensus 16 there. 17 Q. The Helsinki criteria, I think is 19 -- is 18 it 1995? 19 A. It's '97, but there has been an update 20 essentially, a review of the criteria, and 21 most things that I saw held and that was 22 2004, I believe. 23 Q. Okay. 24 A. Yes. 25 Q. At least the '97 Helsinki criteria is --	Page 56 1 asked to assume it's above background, 2 I'll do that because I know that there are 3 bystander cases where there clearly are 4 exposure to above background and 5 mesotheliomas have developed. So I mean 6 in those cases, just like this case, I'm 7 asked to explain how asbestos causes 8 disease. I'm not going to have any 9 opinions on whether or not their exposure 10 was above background or not. I'm just 11 asked to assume that. 12 Q. And probably the better question is: 13 Whenever you're asked to testify, for 14 example, from the Simon Greenstone firm, 15 you're assuming that they have evidence 16 that there is an above-background 17 exposure? 18 A. Correct. 19 Q. It turns out if there isn't an 20 above-background exposure, then it's 21 difficult to connect the mesothelioma to 22 the asbestos exposure? 23 A. I agree. 24 Q. One of my colleagues sent me an email. I 25 can't find it, but somewhere in your
Page 55 1 well, it's an esteemed group of 2 pathologists, it's not a peer-reviewed 3 publication, it's the outcome of a group 4 of pathologists getting together and 5 talking about asbestos exposure and 6 asbestos disease? 7 A. Well, that's true but, I mean, those are 8 opinions then of, as you say, of a varied 9 group of well-established investigators 10 and scientists, yes. 11 Q. And I think I asked this before: Have you 12 ever been asked to testify in a case where 13 someone has been diagnosed with 14 mesothelioma but has no occupational 15 exposure to asbestos? 16 A. I've testified in several, quote-unquote, 17 bystander cases. I've testified in -- I 18 guess what could be called environmental 19 exposures, but clearly these were 20 exposures above background. If that's 21 what you're asking me, then sure. 22 Q. Your view in those cases is that the 23 bystander exposures are above background? 24 A. Well, if they've been, you know, I'm not 25 the one to establish that, but if I'm	Page 57 1 report, it says that this is an expert 2 report for federal court. And regardless 3 of whether I can find it, there is a case 4 in federal court. Do you make any 5 distinction or do you provide any 6 different reports whether you're in 7 federal court or state court? 8 A. Well, the federal report, when it was 9 first developed obviously was more 10 inclusive of references and more detailed 11 in my opinions, but I mean the nature of 12 my opinions is the same. 13 Q. But, for example, would we see a different 14 report if this were in Minnesota District 15 Court as opposed to federal court, is 16 there a different report for state court 17 cases? 18 A. No, I would say only in its scope. I 19 mean, it's not different than any of my 20 other. 21 Q. Right, but that's what I'm trying to find 22 out. For example, if state court cases 23 there are less pages to it, how is that 24 different? 25 A. Yeah, there would be fewer pages. I mean,

Page 58	Page 60
1 if we just had a generic report that I use 2 if it's a state court, and I'm asked for a 3 report, it would be many fewer pages, 4 sure. 5 Q. Why is that? 6 A. Well, I wouldn't -- I don't typically 7 include the references, doesn't have the 8 pages of testimony attached to it, but I 9 mean, that's the main difference. 10 Q. Did someone tell you, you didn't need to 11 do that for state court or why do you do 12 that, make that distinction between state 13 and federal court? 14 MS. CABUTTO: Can I interrupt to the 15 extent that Dr. Brody obviously is not an 16 attorney. And I don't think he's probably 17 read the rules with regard to expert 18 reports as it relates to Minnesota federal 19 court versus Minnesota state court, so to 20 that extent with that objection on there, 21 he can obviously answer the question if 22 he's able to. 23 A. Okay. Yeah, I mean my answer to your 24 question is that Simon Greenstone decided 25 which report they're going to submit, and	1 the vice chair of the pathology 2 department. So that's my academic 3 association. And the rest of the time I'm 4 trying to enjoy myself. 5 Q. We're getting towards the end of 2014, can 6 you give me an estimate of your income 7 from testifying in 2014? 8 A. It would be probably around \$250,000. 9 Q. And is all your testifying work in 10 asbestos litigation? 11 A. Yes. 12 Q. And all of it is at the request of 13 plaintiffs or attorneys representing 14 plaintiffs in asbestos litigation? 15 A. Well, it has been this year, but I've 16 testified for a number of different 17 companies over the years and various 18 courts but, I mean, if you want the 19 details there, I'm happy to give it to you 20 but about ten different companies have 21 asked me to give the same testimony for 22 their purposes. 23 Q. In asbestos litigation? 24 A. Okay. Yes. These are insurance recovery 25 cases where they need to get the trigger
Page 59	Page 61
1 you have it. I have nothing further to 2 say about it. 3 BY MR. HUGHES: 4 Q. Okay. All right. That's fair enough, 5 Doctor. How many times say in 2014 have 6 you testified for clients represented by 7 the Simon Greenstone firm? 8 A. Maybe once every other month or so, 9 something like that. 10 Q. At one point in time somebody had told me 11 that at least you had kept Wednesdays 12 clear as a general proposition in case the 13 need arose for you to testify either in a 14 deposition or a trial, is that accurate? 15 A. Well, I did that some years ago but I 16 haven't done that for quite some time now. 17 Q. Are you retired or are you still teaching 18 or what are you doing nowadays when you're 19 not testifying? 20 A. Yes, I'm retired. I'm a professor 21 emeritus in the pathology department, 22 excuse me, at Tulane University. I'm 23 still working on a couple of projects with 24 professors there that I actually hired as 25 beginning professors when I was there as	1 theory straightened out of who gets to 2 cover their liabilities, and they need 3 exactly the same testimony I've given -- 4 I'm asked to give in a case like this. 5 Q. It's on behalf of people, whether it's 6 company or plaintiffs that are attempting 7 to either make some recovery or make some 8 claim of asbestos exposure and causative 9 of some damage to them? 10 A. That's right. 11 Q. When was the last time you testified for a 12 company as opposed to an individual 13 plaintiff? 14 A. Thorp Insulation 2012. 15 Q. All right. I want to ask just a few more 16 questions about the radiation and then I 17 think I'll be done. 18 I think you told me this earlier. 19 Can therapeutic radiation and asbestos 20 exposure, can both be the cause of 21 mesothelioma? 22 A. Yes. 23 Q. Just so I'm clear, in the same person, so 24 if a person has radio -- or excuse me, 25 therapeutic radiation and asbestos

Page 62	Page 64
1 exposure and they develop mesothelioma 2 somewhere down the line, both of those 3 could be a cause of mesothelioma? 4 A. Right. I would opine that they 5 contributed by causing genetic errors, and 6 therefore were both the cause, yes. 7 Q. If that were to occur, would you be able 8 to provide any percentage of what 9 percentage was caused by the therapeutic 10 radiation and what would have been caused 11 by the asbestos exposure? 12 A. No, I would have no idea how to do that. 13 Q. Do you know if there is any threshold of 14 exposure to therapeutic radiation that 15 would cause mesothelioma? 16 A. I think there is. I would ask a 17 radiologist who does that sort of thing 18 what levels of -- they're measured in 19 grays it's called, degrees of radiation. 20 Perhaps they have a level that they know 21 will cause cell transformation, but I 22 don't know what that number is. 23 Q. Have you done the same thing in asbestos 24 litigation, asked industrial hygienists, 25 people who do exposure assessments what	1 asbestos, but I don't know that that has 2 ever been done. This is just an opinion 3 I'm giving you based on something -- 4 you're asking me hypothetical questions, 5 so I'm giving you sort of a hypothetical 6 response. 7 But typically, since you don't know 8 just where it was initiated, you would 9 have to -- you would have to conclude that 10 the radiation induced genetic errors and 11 the asbestos induced genetic errors at 12 levels that caused the mesothelioma. 13 Q. And I was trying to include all radiation 14 exposures, just not the therapeutic 15 radiation exposures. Would all of those, 16 you know, flight, sun, x-rays, whatever -- 17 A. Well, I know you're trying to do that. 18 You've been trying to do that since the 19 beginning of the deposition, and I -- and 20 I just don't see how you can do that for 21 the reasons that I've stated. 22 Q. I'll give up now, Doctor. 23 A. Fair enough. 24 Q. I'm not smart enough to be too sly about 25 what I'm doing, Doctor. I want to check
Page 63	Page 65
1 the threshold might be for causing 2 mesothelioma? 3 A. Well, there is a literature there that 4 states there is no known threshold, I 5 mean, epidemiologists have tried to set up 6 a threshold. And as far as I can tell, 7 they've not found one. 8 Q. Let me just go back to my therapeutic 9 radiation and asbestos exposure, the one I 10 kind of started out with. Got a person 11 who has got therapeutic radiation, has 12 asbestos exposure, develops mesothelioma 13 down the line, are the cumulative 14 radiation exposures causative of the 15 mesothelioma? 16 A. Yes. I would say so. I mean, if you had 17 a, you know, if you had an autopsy, if one 18 was able to do an autopsy on that person, 19 you might be able to separate out the two 20 because the area where the radiation hits 21 the lung could set up a scarring, an area 22 of scarring. And if the mesothelioma 23 developed -- were developing in a separate 24 area, you might be able to say, well, it 25 wasn't the radiation. It was the	1 my notes and I need a couple minutes to do 2 that. While I'm doing that, if somebody 3 else has questions, go ahead; otherwise, I 4 would just like to take a few minutes to 5 go over my notes. 6 7 EXAMINATION 8 9 10 BY MR. PESCHEL: 11 Q. This is Mark Peschel. I'll jump in. 12 Good morning, Dr. Brody. 13 A. Good morning. 14 Q. I don't have a lot of questions for you 15 but let me start with this: Does your 16 report contain all the opinions that you 17 will give at trial in this matter? 18 MS. CABUTTO: Objection. 19 A. I think so. I don't know everybody 20 everything I'm going to be asked but those 21 are the opinions that I intend to talk 22 about, sure. 23 BY MR. PESCHEL: 24 Q. All right. And does the report list all 25 the articles, studies and other sources

Page 66	Page 68
1 that you will rely on for those opinions? 2 MS. CABUTTO: Objection as to form. 3 A. Well, you know, I don't know about all, 4 but it certainly would contain everything 5 at this point that I intend to rely on, 6 sure. Plus, you know, my CV obviously has 7 a lot of my own work that's not referenced 8 in the report, and also contains numerous 9 references that are not in the report. 10 BY MR. PESCHEL: 11 Q. All right. Are slides 1 through 24 the 12 only exhibits you intend to use at trial? 13 A. Yes. 14 Q. I want to talk just a little about the rat 15 experiments that you did, designed a model 16 or mimic exposures for insulators, miners 17 in asbestos mines, and millers who 18 processed raw asbestos, is that accurate? 19 A. Well, they weren't designed actually to do 20 that initially, but the concentrations of 21 dust that the animals got actually were at 22 levels, as you indicated, experienced by 23 those trades at high level. 24 Q. The experiments did not attempt to 25 recreate or mimic exposures to asbestos at	1 references in your report relate to or 2 discuss any other industries? 3 A. Yeah, I can't say off the top of my head. 4 I would have to look. 5 Q. Are you aware of any epidemiological 6 studies regarding steel mills? 7 A. Well, there may very well be, but I don't 8 know, I mean, any -- whether it's steel 9 mills or airplane manufacturing, whatever, 10 you know, I don't keep track of just which 11 studies were done but, I mean, any 12 industry that I know of that -- where 13 there is asbestos exposure consistently 14 has produced mesotheliomas. So I don't 15 know that steel mills or any other 16 manufacturing facilities would be any 17 different but, like I say, I've certainly 18 not been a part of any studies like that 19 and I don't know if there have been any 20 done. 21 Q. And you're not aware that any of the 22 referenced studies in your report relate 23 to steel mills, is that true? 24 A. Specifically, that's true but, like I say, 25 if I went into Dr. Selikoff's book I would
Page 67	Page 69
1 steel mills, correct? 2 A. Right. We didn't try to mimic any 3 specific setting, that's true. 4 Q. And have you performed any experiments or 5 studies related to steel mills? 6 A. No. 7 Q. Your report references a study regarding 8 textile and mining industries, I believe 9 that's at Footnote 2, Sebastien article 10 from 1989. I glanced at the article. Do 11 you know if any of the other articles or 12 studies relate to any other industries 13 that are cited in your report, Footnote 1 14 through 82? 15 A. Well, I don't know. There probably are 16 some references to those, I mean, Dr. 17 Selikoff's book, Asbestos and Disease, 18 probably talks about that but, you know, I 19 have no specific references that I wrote 20 about related to those occupations. 21 Q. Yes. I'm just wondering off the top of 22 your head, the only specific industry 23 reference I saw was the Sebastien article, 24 the textile mining industry. I'm just 25 curious if you know if any of the other	1 be surprised if he didn't say something 2 about that, but I don't know. I would 3 have to look. 4 Q. You've discussed in your report this 5 concept of aneuploidy, did I pronounce 6 that correctly? 7 A. That's right. 8 Q. And you stated earlier that asbestos 9 causes mesothelioma by two methods: One 10 is binding the DNA, and the second is it 11 develops oxygen radicals, it damages DNA. 12 And my question is: Is aneuploidy caused 13 by both of those methods? 14 A. Yes. 15 Q. And I believe there are other agents 16 beyond asbestos that can cause damage to 17 DNA. Do you offhand know what some of 18 those other agents are? 19 A. Carcinogens just as a general principle, 20 carcinogens cause genetic damage and 21 produce aneuploid cells as a general 22 principle. It's part of the process 23 through which carcinogens cause cancer. 24 Q. More specifically, do you know of any 25 specific substances that cause aneuploidy,

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1 such as different types of metal? 2 A. Well, you know, I don't know. I would 3 have to go and look at the list. If it's 4 a carcinogen, if it's a known carcinogen, 5 then it could cause aneuploidy. If the 6 metal you're interested in is on the list 7 of known carcinogens, then you can assume 8 that it will cause aneuploidy. 9 Q. You've talked a lot today about background 10 levels of exposures, and you stated that 11 there are idiopathic or spontaneous causes 12 to mesothelioma. And I'm wondering, can 13 you disregard background exposures as the 14 cause of idiopathic or spontaneous 15 mesothelioma? 16 A. Well, you can't, and that's a very good 17 question. There may be some individuals 18 who are so highly susceptible, that just 19 the background that we all have is 20 sufficient to cause a cancer that appears 21 to be idiopathic. You cannot rule out 22 that possibility. 23 Q. Do you have any knowledge as to what the 24 background level of asbestos is in the 25 Duluth, Minnesota area?	1 just have a couple more questions. If we 2 have a person who has some occupational 3 exposure to asbestos from a variety of 4 different functions, and there is 5 industrial hygiene results that any 6 manipulation or work with a particular 7 product, any exposure would be below 8 background, would you exclude that as a 9 cause of the mesothelioma? 10 MS. CABUTTO: Objection as to form. 11 A. Well, I think you could do that. I mean, 12 if it doesn't get above background, it 13 shouldn't, by definition it wouldn't 14 contribute. The problem is, of course, 15 that we all have background in our lung so 16 whatever we get from the product or from 17 whatever product it is, adds to, you know, 18 contributes above the background. 19 So if you have a level from a product 20 at background, you have that plus 21 background, that is twice background, add 22 up to above background? Not necessarily, 23 you know, if background is three zeros and 24 your product is three zeros, then no, I 25 would say it doesn't contribute.
Page 71	Page 73
1 A. I don't, but I know the range that I'm 2 familiar with, I mean, could it be 3 different than that? Sure, I don't know. 4 Q. I think that's all the questions I have. 5 Thank you. 6 A. You're welcome. 7 MR. HUGHES: Anyone else? 8 MS. CABUTTO: Just for the record, 9 sorry, John, this is Laura Cabutto. We 10 would reserve any questions until the time 11 of trial. 12 MR. HUGHES: That's fine. I've got a 13 couple more questions. But did somebody 14 else have some questions? All right. I 15 thought I heard something. Laura, you 16 kind of cut out. I think what you said 17 was you're reserving all your questions 18 for the time of trial, right? 19 MS. CABUTTO: That's correct. We 20 are. 21 22 REEXAMINATION 23 24 BY MR. HUGHES: 25 Q. Dr. Brody, this is John Hughes again. I	1 Q. All right. I think that's all the 2 questions I have, Dr. Brody. Thank you 3 for your time. 4 A. You're welcome. Anything else, Laura, or 5 I'll hang up if not. 6 MS. CABUTTO: I don't think so. 7 Everybody else is done? 8 MR. HUGHES: I just want to make 9 sure. Anybody else have any questions? I 10 think we're done, Dr. Brody, thank you. 11 A. You're welcome. 12 MS. CABUTTO: Thank you, Dr. Brody. 13 (The deposition was concluded at 9:40 14 a.m.) 15 16 17 18 19 20 21 22 23 24 25

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2 STATE OF MINNESOTA)
3 COUNTY OF HENNEPIN)
4
5 I hereby certify that I reported the
6 deposition of DR. ARNOLD BRODY on
7 NOVEMBER 13, 2014 in Minneapolis, Minnesota,
8 and that the witness was by me first duly
9 sworn to tell the whole truth;
10 That the testimony was transcribed under
11 my direction and is a true record of the
12 testimony of the witness;
13 That the cost of the original has been
14 charged to the party who noticed the
15 deposition, and that all parties who ordered
16 copies have been charged at the same rate for
17 such copies;
18 That I am not a relative or employee or
19 attorney or counsel of any of the parties or a
20 relative or employee of such attorney or
21 counsel;
22
23 That I am not financially interested in
24 the action and have no contract with the
25 parties, attorneys, or persons with an
interest in the action that affects or has a
substantial tendency to affect my
impartiality;
That the right to read and sign the
deposition was not reserved by the witness and
is to be accomplished in accordance with the
attached letter.
WITNESS MY HAND AND SEAL this
23RD DAY OF NOVEMBER, 2014.

Mari A. Skalicky RMR
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EXHIBIT 5

2010 WL 4676563

Only the Westlaw citation is currently available.

United States District Court,
E.D. Pennsylvania.In re ASBESTOS PRODUCTS
LIABILITY LITIGATION (No. VI).

Dianna K. Larson, et al., Plaintiffs

v.

Bondex International, et al., Defendants.

MDL Docket No. 875.

No. 09–69123.

Nov. 15, 2010.

Opinion**MEMORANDUM****EDUARDO C. ROBRENO**, District Judge.

*1 Before the Court is Defendant Georgia Pacific, LLC's Objections to Magistrate Judge Angell's Memorandum Opinion regarding Defendant's Motion to Exclude Plaintiffs' Experts' Testimony. (doc. no. 75.) Also before the Court is Plaintiffs' Objections to Magistrate Judge Angell's Memorandum Opinion regarding Plaintiffs' Motion in Limine. (doc. no. 76.) Judge Angell denied the parties' motions in limine on the grounds that all experts presented in the instant case meet the requisite standard of qualification, reliability, and fit under [Federal Rule of Evidence 702](#) and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

I. Background

Plaintiff Dianna Larson was diagnosed with [mesothelioma](#) in 2006. (Mem. Op., doc. no. 73, at 1.) Plaintiffs allege that the [mesothelioma](#) is the result of exposure to asbestos in joint compound products which Dianna Larson used in the 1970s when she and her first husband built two homes in Utah. (*Id.*) Named Defendants are alleged to have manufactured, sold or distributed chrysotile-containing joint compound products. (*Id.*)

After an initial voluntary dismissal of the action, the case was re-filed in the Third Judicial District Court, Salt Lake County, Utah, and removed to the United States District Court for the District of Utah in 2008. (*Id.*, at 1 n. 1.) The case was transferred to the Eastern District of Pennsylvania as part of MDL 875 In Re: Asbestos in June 2008. (*Id.*)

Dianna Larson alleges that she was exposed to Defendant's asbestos-containing joint compound products during the construction of two homes, which she and her first husband conducted with virtually no outside assistance. (*Id.* at 2.) Dianna Larson alleges that she was exposed when she sanded down Defendant's asbestos-containing products, used asbestos-containing sheetrock for the walls and ceilings, cleaned up the sites where Defendant's products were used, and cleaned the clothes worn by her and her husband, which contained asbestos dust. (*Id.* at 2.)

Both Plaintiffs and Defendants have filed motions to exclude each other's expert testimony regarding the cause of Dianna Larson's injuries under [Federal Rule of Evidence 702](#) and [703](#).

II. Standard of Review

[Federal Rule of Evidence 702](#) sets forth the standard for admitting expert testimony. The Rule requires that an expert witness must be “qualified as an expert by knowledge, skill, experience, training, or education” may testify as to his or her opinion if “(1) the testimony is based upon sufficient facts or data (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.” [Fed.R.Evid. 702](#). The Third Circuit has explained that “[Rule 702](#) embodies a trilogy of restrictions on expert testimony: qualification, reliability, and fit.” *Schneider v. Fried*, 320 F.3d 396, 404 (3d Cir.2003) (citing *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)).

*2 The “reliability” of the underlying principles and methods is the basis for each parties' objection to expert testimony in the instant case. (Mem. Op., doc. no. 73, at 3.) To determine the reliability of a scientific principle or method, a court may examine numerous factors, including whether the principle or method has been tested or is capable of being tested, whether the potential rate of error in the method can be ascertained, whether it has been

subjected to peer review and publication, and whether it is generally accepted within the scientific community. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, at 593–94. The test for reliability is “flexible,” and a court has “broad latitude” in how it chooses to determine liability. *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 141 (1999). The approach to determining reliability of expert testimony is “tied to the facts” of a particular case, and highly dependent on the nature of the expert testimony presented. *Id.* at 148 (quoting *United States v. Downing*, 753 F.3d 1224, 1242 (3d Cir.1985)).

In reviewing objections to a magistrate judge's ruling on a non-dispositive matter, a district court will only reverse a magistrate judge's decision if it “is clearly erroneous or contrary to law.” *Fed. Rule. Civ. P. 72(a)*. A magistrate judge's ruling concerning the admissibility of expert testimony is non-dispositive discovery ruling, and is therefore subject to a clearly erroneous standard of review. *See, e.g., U.S. v. Polishan*, 336 F.3d 234, n. 2 (3d Cir.2003) (noting that the District Court found that the Magistrate Judge's discovery rulings were not clearly erroneous).

III. Analysis

The motions at issue, and objections to Judge Angell's Memorandum Opinion for each, are addressed below *ad seriatim*.

*A. Defendant Georgia Pacific LLC's Motion to Exclude Testimony of Plaintiff's Experts Dr. Arnold Brody and Dr. Jacques Legier Under Federal Rule of Evidence 702*¹

¹ Defendant Union Carbide joined in Georgia Pacific LLC's motion (doc. no. 24.) Defendant Bondex filed a Motion in Limine similar to Georgia Pacific LLC's (doc. no. 23.) Bondex did not object to Magistrate Judge Angell's denial of Bondex's motion, and filed a Suggestion of Bankruptcy on July 2, 2010 (doc. no. 74.)

Defendant Georgia Pacific LLC (“Georgia Pacific”) objects to the admission of Plaintiff's experts, cellular biologist Arnold Brody, Ph.D., and pathologist Jacques Legier, M.D., who testify that inhaled chrysotile fibers can cause *peritoneal mesothelioma*. (doc. no. 19.) Georgia Pacific argues that these opinions are not based on generally accepted scientific evidence, and are based on

“fatally flawed” methodology. (Def.'s Mot., doc. no. 19, at 5.)

1. Dr. Brody's Opinion

It is Dr. Brody's opinion that all asbestos fiber varieties, including the chrysotile variety involved in the instant case, can cause *asbestosis*, *pleural fibrosis*, *lung cancer*, and *mesothelioma*. (Mem. Op. at 6) (citing “Asbestos Induced Lung Diseases” by Arnold R. Brody, Ph.D., doc. no. 19–12, at 2.) Dr. Brody supports his opinion by testifying that there are “scientific investigations on humans and correlative animal and cell studies” confirming the relationship between asbestos fibers and four asbestos-related diseases discussed. (Mem. Op. at 7; *Id.*) Dr. Brody included in his curriculum vitae a list of one hundred and forty-six peer reviewed publications, and approximately fifty chapters, authored or co-authored by Dr. Brody. (Mem. Op. at 7.)

*3 Judge Angell ultimately determined that Dr. Brody's opinion was reliable, and that any concern about lack of citation to specific studies can be introduced on cross-examination, and be considered by the jury in determining the weight that should be given to his testimony. (*Id.* at 8.) Judge Angell noted that Dr. Brody's expert testimony at trial will be limited to “general testimony about how asbestos causes *cancer* and may not include any opinion as to specific causation in this case.” (Mem. Op. at 6.) Plaintiffs are offering Dr. Brody's testimony to “educate the jury” about “the physiological design and function of the lungs, how asbestos fibers migrate throughout the body and are deposited in the lungs, the different types of asbestos fibers, and how all exposures to asbestos contribute to cause an individual's disease.” (Pl.'s Mem., doc. no. 43, at 21.)

Defendants object to Judge Angell's finding on the basis that Dr. Brody's opinion is not based on “scientifically valid methodology,” namely, that Dr. Brody did not evaluate the relevant epidemiological literature before reaching his opinions. (Def.'s Objects., doc. no. 75, at 5.) (citing Dep. of Arnold R. Brody at 8:18–24.)² Defendants argue that the epidemiological link between certain kinds of asbestos fibers and disease processes is well-established. (Def.'s Objects., doc. no. 75, at 6–7.) Further, Defendant argues that district courts in this Circuit have held that “no reliable scientific approach can simply ignore the epidemiology that exists.” (Def.'s Objects., doc. no. 75,

at 8) (citing *Perry v. Novartis Pharmaceuticals Corp.*, 564 F.Supp.2d 452, at 465 (E.D.Pa.2008)). Defendant asserts that Dr. Brody does not rely on any epidemiological studies and is therefore inherently unreliable. (Def.'s Objects., doc. no. 75, at 8, n. 9.)

2 Q: [...] Is it fair to say you have not undertaken to evaluate the epidemiological literature to determine the extent to which well-differentiated papillary mesothelioma has been associated with asbestos exposure?

A: Correct.

However, in *Heller v. Shaw Industries*, 167 F.3d 146(3d Cir.1999), the Third Circuit Court of Appeals emphasized the “flexible nature” of the Daubert inquiry, and held that an expert does not have to “cite published studies on general causation in order to reliably conclude that a particular object caused a particular illness.” *Id.* at 157. Further, the *Perry* court noted that, “it has not been declared in [the Third Circuit] that epidemiological studies are an indispensable element in the presentation of a prima facie [] product liability case” but that “epidemiology is the primary generally accepted methodology for demonstrating a causal relation between a chemical compound and a set of symptoms or disease.” *Perry*, 564 F.Supp.2d at 465 (internal citations omitted).

Dr. Brody may not have relied on epidemiological studies, but his expert opinion is not without a reliable basis. Judge Angell noted that Dr. Brody relied on one hundred and forty-six peer-reviewed publications of which he is an author or co-author, and many of these articles relate to the effects of chrysotile fibers on a molecular level. (Mem. Op., doc. no. 73, at 7.) These articles include, but are not limited to: *Chrysotile asbestos inhalation in rats: deposition pattern and reaction of alveolar epithelium, and pulmonary macrophages*. (doc. no. 19–2, at p. 13, article no. 32); *Interstitial accumulation of inhaled chrysotile asbestos fibers and consequent formation of microcalcifications* (*Id.*, article no. 34); *Characterization of three types of chrysotile asbestos after aerosolization* (*Id.*, article no. 42); *Chrysotile asbestos inhalation induces tritiated thymidine incorporation by epithelial cells of distal bronchioles* (*Id.*, article no. 78.); see also article nos. 93, 102.

*4 Given the purpose of Dr. Brody's testimony, to assist the jury in understanding the relationship between exposure to asbestos fibers and disease processes generally, and the breadth of peer-reviewed publications

relied on, this Court will not disturb Judge Angell's finding that Plaintiff has met the reliability requirement of Rule 702 and *Daubert*.³

3 This Court recently admitted the testimony of Dr. Brody regarding general causation in an asbestos personal injury trial before Judge Robreno. See *Schumacher v. Amtico*, Docket No. 10–01627 (E.D.Pa.2010). Just as in the instant case, Dr. Brody was offered to assist the jury in understanding the mesothelioma disease process generally. Though his opinion that every exposure to asbestos is a cause of the disease is subject to a bona-fide debate in the scientific community, and could even be called “shaky” by some, the Court, in its gatekeeping role, found that Dr. Brody's opinion satisfied the three *Daubert* requirements and allowed the jury to hear his testimony.

2. Dr. Legier's Opinion

Dr. Jacques Legier will offer testimony that “[t]he consensus of the medical and scientific community supports the conclusion that both pleural and peritoneal mesothelioma are signature diseases caused by exposure to asbestos, including chrysotile asbestos.” (Mem. Op. at 11) (citing Supplemental Expert Report of Jacques Legier, M.D., doc. no. 19–7, at 2.) In support of his opinion, Dr. Legier cites, *inter alia*, peer-reviewed medical literature, case reports of individuals who were exposed to chrysotile fibers and developed peritoneal mesothelioma, and fiber migration studies showing that chrysotile fibers have the capacity to cause malignant changes in the mesothelial cells. (*Id.*)

Judge Angell rejected Defendant's argument that Dr. Legier's opinion is unreliable because the scientific methods he cites “have been used in incomplete and misleading ways” and “ignor[es] relevant epidemiological studies.” (Mem. Op. at 12) (citing Def.'s Mot., at 16–17.) Judge Angell found that first, epidemiology studies are not per se required. (Mem. Op. at 12) (citing *Heller v. Shaw Industries*, 167 F.3d at 155–56(3d Cir.1999)). Further, Dr. Legier's report does not ignore epidemiological studies, rather, the studies he relies on are contrary to the studies which Defendant's expert relies on. (*Id.*)

Defendants object to Judge Angell's findings on the ground that Dr. Legier “fail[s] to consider the available epidemiology” and that he “reject[s] well-accepted statements in the scientific literature.” (Def.'s Objects.,

doc. no. 75, at 10.) Further, Defendants argue that Dr. Legier's differential diagnosis is fatally flawed because he did not consider a potential idiopathic origin to Ms. Larson's disease. (*Id.* at 11.)

First, Dr. Legier's report relies on numerous epidemiological studies, including, but not limited to, *Consensus Report (Helsinki Criteria) Scandinavian Journal of Work and Environmental Health* 1992; 311–316 at 313 (Dr. Legier Rep., doc. no. 19–15, at 4) and noted epidemiologist Paolo Boffeta's *Epidemiology of Peritoneal Mesothelioma: a Review* (*Id.* at 6.) Further, the sources that Dr. Legier relies on are based on findings from numerous epidemiological studies. Defendants are free to challenge the specific epidemiological studies, and the way in which Dr. Legier interprets them, at trial.

Second, regarding Dr. Legier's alleged failure to consider an idiopathic origin, the Third Circuit Court of Appeals has explicitly held that an expert's opinion should not be excluded because “he or she has failed to rule out every possible alternative cause of a plaintiff's illness.” *Heller* at 155, 156. Rather, “[s]uggested alternative causes” of the injury “affect the weight that the jury should give the expert's testimony and not the admissibility of that testimony.” *Id.* at 157.

*5 Under these circumstances, Dr. Legier's report satisfies the reliability requirement of [Rule 702](#) and *Daubert*.

B. Plaintiffs' Motion In Limine to Exclude or Limit Dr. Dyson's Dose Reconstruction Testimony Pursuant To Daubert and Rules 702 and 703 of the Federal Rules of Evidence (doc. no. 20)

Dr. Dyson is prepared to testify at trial that Dianna Larson's “exposure dose from the use of all drywall joint compounds in the construction of her first home is likely to have been on the order of 0.3 fib*yr/cc or less.” (doc. no. 20–3, at 5.) Dr. Dyson asserts that this is “very low” and comparable to an individual's exposure in an urban environment breathing ambient air over a seventy-year lifetime. (*Id.*) Plaintiffs object to Defendants' expert, Dr. William L. Dyson's “dose recreation” testimony, on the grounds that it fails to satisfy *Daubert*'s standard of relevance and reliability, and further argue that there is not a good fit between this methodology and the facts of the instant case. (Pl.'s Objects., doc. no. 76–1, at 6.)

Judge Angell determined that Dr. Dyson's testimony meets the “fit” requirement, as it “aid[s] the jury in resolving [the] factual dispute” of whether Defendants' products caused Plaintiff's injury in the instant case. (Mem. Op. at 15) (quoting *Meadows v. Anchor Longwall*, 306 Fed. Appx. 781, 790 (3d Cir.2009) (internal citations omitted)). Judge Angell further found that Dr. Dyson's testimony was reliable, as he used “his knowledge and experience, [and] applied an accepted methodology to information garnered from Ms. Larson's medical records, deposition testimony and answers to discovery requests, and reached conclusions that reliably flow from the available data and methodology.” (Mem. Op. at 15.)

Under these circumstances, this Court will not disturb Judge Angell's findings that Dr. Dyson meets the reliability and fit requirements of [Rule 702](#) and *Daubert*.

C. Plaintiffs' Motion in Limine to Exclude or Limit all Testimony Regarding Quantification of Exposure (doc. no. 25)

Plaintiffs have moved to exclude testimony from any of Defendants' expert regarding the following matters:

- (1) the quantification of asbestos fiber potency, including any opinions made in reliance on the risk assessment of Hodgson and Darton, one of the various iterations of the Berman & Crump risk assessment, or the similar Brattin & Crump quantitative risk assessment model; (2) the alleged inability of chrysotile asbestos to cause pleural or [peritoneal mesothelioma](#); and (3) that there is any “safe level” or “threshold dose” of asbestos exposure, below which such exposures cannot cause [mesothelioma](#). (Mem. Op., doc. no. 73, at 16, quoting Pl.'s Reply, doc. no. 56, at 18.)

Plaintiffs assert that the above conclusions and calculations lack reliability and general acceptance in the scientific community. (Mem. Op., doc. no. 73, at 16; Pl.'s Reply, doc. no. 56, at 5–22.)

Judge Angell determined that Defendant's experts "used valid scientific methodology, citing to peer-reviewed scientific studies, in reaching their conclusions...." (Mem. Op. at 17.) Judge Angell characterized Plaintiffs' Motion in Limine as an attack on the credibility of Defendants' experts, which is appropriate for trial, but not grounds for exclusion under *Daubert*. (Mem. Op. at 17) (citing *Kannakeril v. Terminix International, Inc.*, 128 F.3d 802, 806 (3d Cir.1997) ("Admissibility decisions focus on the expert's methods and reasoning; credibility decisions arise after admissibility has been determined.")).

*6 Under these circumstances, this Court will not disturb Judge Angell's findings that the above expert opinions meet the reliability and fit requirements of Rule 702 and *Daubert*.

IV. Conclusion

For the above stated reasons, Defendant Georgia Pacific, LLC's Objections to Magistrate Judge Angell's Order Denying Motion to Exclude Plaintiffs' Experts' Testimony are overruled. Plaintiffs' Objections to Judge Angell's

Order Denying Defendants' Experts' Testimony are overruled. An appropriate order follows.

ORDER

AND NOW, this 15th day of November, 2010, it is hereby **ORDERED** that Defendant Georgia Pacific LLC's Objections to Magistrate Judge Angell's Memorandum Opinion (doc. no. 75) filed on June 7, 2010 and (doc. no. 78) filed on June 21, 2010 are **OVERRULED**.

It is further **ORDERED** that Plaintiffs' Objections to Magistrate Judge Angell's Memorandum Opinion (doc. no. 76) filed on June 7, 2010 are **OVERRULED**.

AND IT IS SO ORDERED.

All Citations

Not Reported in F.Supp.2d, 2010 WL 4676563, Prod.Liab.Rep. (CCH) P 18,532

EXHIBIT 6

Curriculum Vitae February 2023

Steven Earl Haber, M.D., F.A.C.P., F.C.C.P.

Current Position: Pulmonary Diseases, Occupational Lung
Diseases and Internal Medicine

Office Address: Respiratory Medicine Consultants
1220 Blalock, Suite 250
Houston, Texas
77055

Phone Number: 713-932-8664

Fax Number: 713-464-2976

E-mail Address: drshaber@rmcmed.com

Web Address: www.rmcmed.com

Board Certification:

2012 Recertification, American Board of Internal Medicine, Subspecialty:
Pulmonary Diseases

2002 Recertification, American Board of Internal Medicine, Subspecialty:
Pulmonary Diseases

1992 Diplomate, American Board of Internal Medicine,
Subspecialty: Pulmonary Diseases

1989 Diplomate, American Board of Internal Medicine,
Internal Medicine

Diplomate, National Board of Physicians and Surgeons
Internal Medicine and Pulmonary Diseases

Certifications:

NIOSH "B" Reader, certified 2003-2007, 2007-2011, 2011-2015, 2015-2019,
2019-2024

Medical Review Officer (MRO), certified 2010
ACLS, certified through 2024

Degrees:

1986 Doctor of Medicine
1981 Bachelor of Arts, with Honors
1978 Graduate, Memorial Senior High School, cum Laude

Medical Licensure:

Texas
Mississippi
Arkansas
New Mexico
Oklahoma

Education and Professional Training:

1989-1991 Fellowship in Pulmonary Diseases
Baylor College of Medicine Affiliated Hospitals
Houston, Texas

1987-1989 Residency in Internal Medicine
Baylor College of Medicine Affiliated Hospitals
Houston, Texas

1986-1987 Internship in Internal Medicine
Baylor College of Medicine Affiliated Hospitals
Houston, Texas

1982-1986 Medical School
University of Texas Medical School at Houston
Houston, Texas

1978-1981 Undergraduate in Plan II Honors
University of Texas at Austin
Austin, Texas

1977-1978 Memorial Senior High School
Houston, Texas

1974-1977 A.Y. Jackson Secondary School
Toronto, Ontario, Canada

Administrative and Advisory:

Emergency Care Committee, Harris County Medical Society
2023

HCMS Delegate to the Texas Medical Association
2023

Texas Medical Board, Expert Panelist
2023

Disaster Preparedness Task Force, Harris County
2023

Texas Medical Board, Expert Panelist
2022

Emergency Care Committee, Harris County Medical Society
2022

HCMS Delegate to the Texas Medical Association
2022

Disaster Preparedness Task Force, Harris County
2022

Emergency Care Committee, Harris County Medical Society
2021

HCMS Delegate to the Texas Medical Association
2021

Texas Medical Board, Expert Panelist
2021

Disaster Preparedness Task Force, Harris County
2021

Emergency Care Committee, Harris County Medical Society
2020

HCMS Delegate to the Texas Medical Association
2020

Texas Medical Board, Expert Panelist
2020

Disaster Preparedness Task Force, Harris County
2020

Emergency Care Committee, Harris County Medical Society
2019

HCMS Delegate to the Texas Medical Association
2019

Texas Medical Board, Expert Panelist
2019

Disaster Preparedness Task Force, Harris County
2019

Health and Human Services Commission, Office of Inspector General, Medical
Expert
2018

HCMS Delegate to the Texas Medical Association
2018

Disaster Preparedness Task Force, Harris County
2018

Texas Medical Board, Expert Panelist
2018

Emergency Care Committee, Harris County Medical Society
2018

Emergency Care Committee, Harris County Medical Society
2017

HCMS Delegate to the Texas Medical Association
2017

Emergency Care Committee, Harris County Medical Society
2016

HCMS Delegate to the Texas Medical Association
2016

Chairman TMA Reference Committee on Science and Public Health
2015 TexMed

HCMS Delegate to the Texas Medical Association
2015

Emergency Care Committee, Harris County Medical Society
2015

HCMS Delegate to the Texas Medical Association
2014

TMA Reference Committee on Science and Public Health
2014 TexMed

Emergency Care Committee, Harris County Medical Society
2014

HCMS Delegate to the Texas Medical Association
2013

TMA Reference Committee on Science and Public Health
2013 TexMed

Emergency Care Committee, Harris County Medical Society
2013

Emergency Care Committee, Harris County Medical Society
2012

HCMS Delegate to the Texas Medical Association
2012

Emergency Care Committee, Harris County Medical Society
2011

HCMS Delegate to the Texas Medical Association
2011

TMA Reference Committee on Science and Education
2011 TexMed

TMA Reference Committee on Science and Education
2010 TexMed

HCMS Delegate to the Texas Medical Association
2010

Emergency Care Committee, Harris County Medical Society
2010

HCMS Delegate to the Texas Medical Association
2009

Emergency Medical Services Committee, Harris County Medical Society
2009

Emergency Medical Services Committee, Harris County Medical Society
2008

HCMS Delegate to the Texas Medical Association
2008

Emergency Medical Services Committee, Harris County Medical Society
2007

HCMS Alternate Delegate to the Texas Medical Association
2007

Emergency Medical Services Committee, Harris County Medical Society
2006

HCMS Alternate Delegate to the Texas Medical Association
2006

Medical Advisor, Sellers Brothers Inc.
2005

Medical Advisor, Sellers Brothers Inc.
2004

Emergency Services
Columbia-HCA Spring Branch Hospital
2003

Pulmonary Director, Select Specialty Hospital-Houston West
2002

Emergency Services
Columbia-HCA Spring Branch Hospital
2002

Board of Socioeconomics, Harris County Medical Society
2001

Pulmonary Director, Select Specialty Hospital-Houston West
2001

Emergency Services
Columbia-HCA Spring Branch Hospital
2001

Chest Radiology Consultant, Prime Healthcare Providers/Prime Health at Work
2000

Board of Socioeconomics, Harris County Medical Society
2000

Pulmonary Director, Select Specialty Hospital-Houston West
2000

Emergency Services
Columbia-HCA Spring Branch Hospital
2000

Medical Advisory Board, Lincare
2000

Chest Radiology Consultant, Prime Healthcare Providers/Prime Health at Work
1999

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1999

Board of Socioeconomics, Harris County Medical Society
1999

Pulmonary Director, Select Specialty Hospital-Houston West
1999

Medical Advisory Board, Lincare
1999

Board of Socioeconomics, Harris County Medical Society
1998

Pulmonary Director, Select Specialty Hospital-Houston West
1998

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1998

Medical Advisory Board, Lincare
1998

Managed Care Committee member, Harris County Medical Society
1997

Pulmonary Director, American Transition Hospital
1997

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1997

Medical Advisory Board, Lincare
1997

Medical Advisory Board, Alert Medical Services
1996

President, Harris County Medical Society, Western Branch
1996

Board of Trustees, Houston Academy of Medicine
1996

Pulmonary Director, American Transition Hospital
1996

Executive Board, Harris County Medical Society
1996

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1996

Medical Advisory Board, Alert Medical Services
1995

President-Elect, Harris County Medical Society, Western Branch
1995

Pulmonary Director, American Transition Hospital
1995

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1995

Medical Advisory Board, Alert Medical Services
1994

Vice President, Harris County Medical Society, Western Branch
1994

Pulmonary Director, American Transition Hospital
1994

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1994

Medical Advisory Board, Alert Medical Services
1993

Secretary and Treasurer, Harris County Medical Society, Western Branch
1993

Pulmonary Director, American Transition Hospital
1993

ICU Committee, Sam Houston Memorial Hospital
1993

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1993

Pathology Committee, HCA Spring Branch Medical Center
1993

Medical Advisory Board, Alert Medical Services
1992

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1992

Invasive Surgical Therapeutic Committee
Columbia-HCA Spring Branch Hospital
1992

Utilization Review Committee, Spring Shadows Pines
1991

Medical Co-director, Hyperbaric Oxygen Department,
Columbia-HCA Spring Branch Hospital
1991

Clinical Instructor, Tuberculosis Control District of Houston
1991

Clinical Instructor, Tuberculosis Control District of Houston
1990

Clinical Instructor, Tuberculosis Control District of Houston
1989

Professional Memberships:

National:

American College of Chest Physicians, Fellow
American College of Physicians, Fellow
American College of Occupational and Environmental Medicine
Alpha Epsilon Delta Premedical Honor Society
Phi Delta Epsilon Medical Fraternity
American Board of Medical Specialties
American Thoracic Society

State and Local:

Texas Medical Association
Harris County Medical Society
Houston Academy of Medicine
Texas Academy of Internal Medicine

Hospital Affiliations:

Memorial Hermann Hospitals
Kindred Triumph Healthcare
Select Specialty Hospital

Publications and Abstracts:

Goodnight-White SJ, Miller CC III, Haber SE, Klein PD, Fletcher EC. Lactate kinetics in severe COPD: Implications of an abnormal aminopyrine breath test. *Chest* 1992; 101: 268S-273S.

Miller CC III, Haber SE, Goodnight-White SJ, Qian W, Fletcher EC. Effect of bronchodilatation on exercise capacity in COPD. *Am Rev Respir Dis* 1992; 145(4): A881.

Haber SE. Synchronous malignant pleural mesothelioma and pulmonary carcinoma in a woman without evidence of asbestos exposure. *Resp Med CME* 2010; 3: 160-161.

Haber SE and Haber JM. Malignant Mesothelioma: A Clinical Study of 238 Cases. *Ind Health* 2011; 49: 166-172.

EXHIBIT 7

Cosmetic Specialties, Inc.

(formerly G & G Specialty Products Co.)

November 28, 1990

Mr. Vincent Reardon
Manager Analytical R & D
AVON PRODUCTS, INC.
One Division Street
Suffern, NY 10901

Central File
RI 0752

Re: Vertal C-0+ Talc

Dear Mr. Reardon:

Confirming our recent phone conversation, as mutually agreed, I will await your revision of the AVON code 0-0752-1 specification for Vertal C-0+ Talc.

Your 1% Loss on Ignition specifications will read 6.5% max. using the USP method.

Your 200 Mesh Screen specification will read 97.0% min. using method CTFA C6-1.

Your Apparent Density range of 0.93 to 1.11 g/cc will remain unchanged.

As soon as I receive this proposed revision, I will pass it along to CYPRUS for approval.

These changes will better define our Vertal C-0+ talc parameters as well as up-date your internal specifications. The results of the above tests will be included on the CYPRUS C/A along with other pertinent data.

I would also like to review the position that COSMETIC SPECIALTIES has with regard to CYPRUS. CSI had been representing the Vermont Talc Division of OMYA until 1988 when CYPRUS purchased their assets. CSI negotiated an agreement with CYPRUS at that time to continue representation.

Today, CSI continues to represent CYPRUS to AVON at all domestic locations.

Personally, I had been employed by CYPRUS from 1970-1985 in the technical

103 Greenleigh Court, Merchantville, New Jersey 08109 / 609-663-9298 / Fax (609) 663-7322

November 28, 1990
Page 2

sales area, concentrating heavily on the Cosmetics market.

I hope you now better understand our relationship with CYPRUS and ask that you contact me if you have any questions.

Sincerely,



Ronald W. Grexa
President

RWG/sg

cc: R. Kastr, M. Keener, F. Bayona, R. Demko, R. Buettner, R. Zazenski,
D. Baker, E. Wissel

RoA_05908

EXHIBIT 8

General Johnson & Johnson Report

I am a medical doctor licensed to practice medicine in Texas. I have been licensed as a physician in Texas since 1987. I am also licensed to practice medicine in Arkansas, New Mexico, Mississippi, and Oklahoma. I have been Board Certified in Internal Medicine since 1989 and Board Certified in the subspecialty of Pulmonary Diseases since 1992. I am a diplomate of the National Board of Physicians and Surgeons. I am a Fellow of the American College of Chest Physicians and a member of the American College of Occupational and Environmental Medicine and the American Thoracic Society. I am a Fellow of the American College of Physicians. I maintain a medical practice in pulmonary disease, occupational lung disease, and internal medicine. I have been actively practicing medicine for more than 30 years in the fields of Internal Medicine and Pulmonary Diseases. My medical licensure is current. Currently, I practice medicine at Respiratory Medicine Consultants in Houston, Texas. I have hospital privileges at several Houston area hospitals.

As part of my practice, I see patients with a variety of medical and pulmonary diseases. I have diagnosed and managed patients with a variety of occupational pulmonary diseases, including asbestos-related diseases. I have been involved in the diagnosis and management of patients with malignant mesothelioma. I have extensive knowledge and clinical experience in the area of occupational lung diseases. I am a certified B-reader from the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH), and the Appalachian Laboratory for Occupational Safety and Health (ALOSH). I have been a NIOSH-certified B-reader since 2003. I have published in peer-reviewed medical journals, including on malignant mesothelioma. I have testified on behalf of plaintiffs and defendants in litigation regarding asbestos-related disease, including mesothelioma. I have been accepted in both State and Federal courts as an expert in internal medicine, pulmonary medicine, and occupational lung disease. A copy of my CV is attached (Exhibit A).

Pulmonologists evaluate and treat patients with diseases of the chest and respiratory system. Internal Medicine physicians, or internists, have training and expertise in diseases related to the internal organs and internal processes of adults. As an internist and pulmonologist, I have specialized knowledge of the pathophysiology, biology, and disorders of not only the chest and respiratory system but organ systems throughout the body. Pulmonologists and internists must also maintain specialized knowledge of the epidemiology of diseases that they see or treat. Additionally, understanding disease causation is essential to our diagnostic

duties. Pulmonologists and internists may face diagnostic situations with a broad differential diagnosis (the number of potential diseases consistent with those of the patient). To focus diagnostic investigation more narrowly, particularly when dealing with dust-related diseases, a comprehensive occupational and exposure history is helpful. With asbestos-related diseases, the ability to use information from an occupational and exposure history requires the physician to understand issues of industrial hygiene, toxicology, chemistry, geology, mineralogy, and epidemiology. Moreover, physicians frequently read the reports and conclusions of other physicians or scientists and rely upon others' work in clinical practice.

All opinions that I have issued in this report are expressed within a reasonable degree of medical certainty. I base my opinions on the clinical, radiological, and pathological data, exposure history available for a patient, along with my education, training, and experience as a medical doctor, internist, and pulmonologist, and the current medical and scientific evidence about the health effects of asbestos, including epidemiological evidence, animal studies, case reports, fiber burden analyses, and laboratory testing. I have attached a listing of references pertaining to the opinions stated herein (Exhibit C) and the attached listing of documents stated herein (Exhibit B).

I hold the following general causation opinions:

1. Asbestos is the major cause of malignant mesothelioma.
2. The carcinogenic risks apply to all asbestos fiber types, regardless of source, including from talc containing asbestos.
3. Talc containing asbestos fibers is carcinogenic to humans and causes malignant mesothelioma.
4. Elongated mineral particles of amphibole and chrysotile have been demonstrated to cause mesothelioma.
5. There is insufficient scientific proof of the existence of "spontaneous" malignant mesothelioma in humans (i.e., unrelated to mutagen). To the extent that such cases occur, they would be exceptionally rare, far below the "background" rate.
6. Consumer talcum powder products are used in a manner that create respirable dust in the user's breathing zone.
7. Johnson & Johnson's cosmetic talcum powder products sourced from mines in Italy, Vermont, and China contained asbestos.
8. In general, when compared to adults, children and adolescents are at greater risk from the effects of carcinogens, such as asbestos.
9. Malignant mesothelioma causes significant symptomatology.

10. The overall survival of patients with malignant mesothelioma is dismal.

The adverse health effects of asbestos include asbestosis, asbestos-related pleural disease, lung cancer, and malignant mesothelioma. These diseases all have in common long latency periods and a cumulative dose-response relationship. The occurrence of disease also depends upon individual susceptibility.

Asbestos is a toxin and all asbestos fiber types are capable of inducing DNA damage. The carcinogenic risks apply to all fiber types wherever they are found, including from talc containing asbestos. Asbestos fibers have been shown to induce oxidative stress, inflammatory response, genetic changes, epigenetic alterations, and cellular toxicity and tissue injuries in target cells in vitro and tissues in vivo. There is an increased susceptibility to cancer from early-in-life exposures to carcinogenic hazards, such as asbestos.

The adverse health effects of asbestos were first reported in the late 1800s. By the early 1900s, more data were published demonstrating that asbestos exposure is hazardous to human health and potentially deadly. In the 1920s and 1930s, more scientific and published literature reported on the health effects of breathing asbestos. By the 1930s and 1940s, medical articles and journals indicated that asbestos could cause cancer. Although cases of pleural tumors associated with asbestos exposure were described in the 1940s and 1950s, the relationship of mesothelioma and asbestos was more firmly established by 1960, based on a case series of 33 patients.[Wagner, 1960] Concerns about asbestos being an impurity in talc were also known for over 100 years. Talc containing fibrous amphiboles and chrysotile have been shown to cause non-malignant diseases and malignancy for well over half a century.[Siegal 1943][Kleinfeld 1955]

The generic term “asbestos” is used to describe a heterogeneous group of hydrated magnesium silicate minerals in fiber form. The definition of asbestos can differ depending on context. As a commercial term, asbestos refers to principally three, fibrous silicate minerals: amosite, crocidolite, and chrysotile. Those mineral fibers have been reported to have commercially useful properties, such as high heat resistance, acid resistance, electrical resistance, tensile strength, and in some cases, flexibility. Geologists or mineralogists may have different definitions, being more concerned about how it was formed (“habit”), whereas physicians and scientists are more concerned if the fiber can create a risk for disease. The federal government typically defines asbestos as the fibrous serpentine (chrysotile) and the fibrous forms of the amphibole group (amosite, anthophyllite, crocidolite, tremolite and actinolite). I have seen documents wherein industry, including Johnson &

Johnson and Pfizer, have used the same definition. A fiber has an aspect ratio of at least 3:1. Chrysotile, amosite, anthophyllite, crocidolite, tremolite and actinolite, when in a fibrous form, can cause a spectrum of diseases, including cancer. Based on the medical and scientific literature on the health effects of asbestos, to physicians such as myself, “asbestos” means any of these six minerals in fiber form.

The commercial properties of asbestos do not correlate with the health effects. There are other fibrous minerals, not meeting the regulatory definition of asbestos, which are also capable of producing adverse health effects (e.g., erionite). For instance, it has long been known that fibers shorter than those included in regulatory definitions are carcinogenic. A definition of asbestos that requires a determination of the “habit” in which the fibers grow, or even a regulatory definition of asbestos such as how asbestos is defined by OSHA, may exclude from consideration fibers of chrysotile, amosite, anthophyllite, crocidolite, tremolite or actinolite that have been demonstrated to cause disease, including mesothelioma. While definitions in other fields can be important to consider for context when reviewing regulatory and scientific documents, those other arenas may not fully capture the relevant health criteria for evaluating causation.

The US Geological Survey (USGS) rejected the use of a commercial definition for asbestos because “properties of commercial-grade asbestos such as flexibility and tensile strength have not been shown to directly contribute to health effects and should not be the sole basis for exclusion of materials that may otherwise meet demonstrated health-related criteria such as length, width, bulk chemistry, and perhaps surface chemistry.”[Meeker, 2006] As the USGS recognizes, different contexts call for different definitions for asbestos: “Asbestos has been defined by workers in many disciplines including those in the commercial asbestos industry and the mining industry, those in the regulatory community, and the mineralogical and geological sciences....[T]he definition of asbestos (and related terminology) can vary depending on the source and purpose. For example, a definition of asbestos appropriate for the asbestos cloth industry, which might require a very long, thin, highly flexible fiber might be different from that used in the asbestos cement pipe industry which could utilize a more brittle and perhaps shorter and wider fiber. Both of these definitions could be vastly different from those used in the health community, where the concern is exposure, risk and ultimately disease.”[id]

Narrowly defining asbestos to only those structures that have a mean aspect ratio of 20:1 to 100:1 or greater, fiber length greater than 5 µm, and width less than 0.5

μm, plus two or more additional characteristics (fiber bundles displaying splayed ends, matted masses of individual fibers, and fibers showing curvature), is inaccurate when trying to identify asbestos as an impurity in other minerals, such as talc, and results in undercounting of asbestos fibers. Dr. Sanchez of the R.J. Lee Group has applied this definition in the past. In this report, the definition that requires aspect ratios of 20:1 or higher is referenced as “Dr. Sanchez’ definition.”

Recently, the FDA commissioned an interagency working group of 38 subject matter experts from multiple federal agencies to develop a white paper reflecting the consensus opinions of the group on the detection of harmful mineral particles associated with cosmetic talc. As part of their recommendations, when testing cosmetic products containing talc and talc intended for use in cosmetics, the working group advises, “Tabulate, at minimum, all amphibole and chrysotile particles having a length ≥ 0.5 micrometer... and a ratio of length to width, i.e., aspect ratio (AR), $\geq 3:1$ ” and “avoid categorizing such particles as non-asbestiform when there is ambiguity as to habit of growth.”[IWGACP, 2021] The working group calls for a focus on fibers or elongate mineral particles (EMP) at a much broader range of sizes and aspect ratios than what would be included using Dr. Sanchez’ definition. Both commercially exploited asbestos deposits and asbestos obtained by the National Institute of Standards and Technology (NIST) include a significant range of sizes of fibers and aspect ratios, most of which would not meet Dr. Sanchez’ definition.[Harper, 2008] [Harper 2012] In fact, Harper et al. reports that only 2%, 8%, and 41%, respectively, of fibers of NIST tremolite asbestos, NIST actinolite asbestos, and asbestos at a shipyard had aspect ratios $>20:1$. [Harper, 2008][Harper 2012] I do not use Dr. Sanchez’ definition of asbestos because it excludes fibers of chrysotile, amosite, anthophyllite, crocidolite, tremolite or actinolite that have been established to be carcinogenic.

Some have claimed that in response to a citizen’s petition to the FDA, that the FDA determined in 1986 that cosmetic talc is safe. The FDA in 1986 did not issue a formal statement that asbestos in trace levels in talc could not cause disease nor do the data support such a conclusion. Over 35 years ago, the Acting Associate Commissioner for Regulatory Affairs issued a letter in response to a citizen’s petition, based on a 1985 risk assessment by Mr. Robert Brown, a mathematician, not a medical doctor. Mr. Brown’s conclusions regarding a “worst-case” scenario were based on faulty assumptions and contradicted by actual data from industry regarding the amount of asbestos in the talc it sold. This risk assessment was a thought experiment of lifetime risk for certain cancers related to exposures to asbestos in talcum powder while being diapered from birth until age two. Thus, the exposure scenario used by Mr. Brown would not be applicable to talc exposures of

longer duration and from uses unrelated to diapering. Mr. Brown was incorrect in the amount of air a baby breathes, thus under-estimating exposure 5- to 6-fold. The amount of air an adult breathes per minute (minute ventilation) is 3 to 4 times greater than that of a neonate. The higher the minute ventilation, the greater amount of asbestos that will be inhaled at any given air concentration. In addition, Mr. Brown did not consider that on a body weight basis, the volume of air passing through the lungs of an resting infant is twice that of a resting adult.[EPA, 2008] Additionally, Mr. Brown made assumptions regarding the frequency of diapering (only five times per day), length of diapering time (75 seconds each), and total duration (two years), all of which likely further falsely lowered the calculated risk. Moreover, there was an assumption of instantaneous stoppage of exposure (i.e., no consideration of the lingering asbestos in the air) and lack of re-entrainment, both of which are scientifically incorrect assumptions.

Mr. Brown assumed that the asbestos content in talc was 0.1% by weight. One of the citations in support of this assumption was from a November 1984 letter by Linda Taylor, Ph.D., who acknowledged that no testing had been done on talc since 1979 (and which had a limit of detection of 0.1% for tremolite and 1-2% for anthophyllite or chrysotile). She noted, "...it is not known whether cosmetic talc (used today) is contaminated with asbestos" and "or what levels of asbestos, if contaminated." The FDA documents cited explicitly acknowledge the lack of data or foundation for the amount of asbestos in cosmetic products, let alone the "worst case" for those talcs. It was an assumption.

The risk assessment also acknowledged there was a "general consensus" that current talc mines are "virtually free of asbestos," which has been shown to be inaccurate due to industry's withholding of hundreds of tests evidencing asbestos in talc. The author of the risk assessment was also led to believe by industry that the "offending mines have gradually been abandoned" making the conclusion of the Acting Associate Commissioner unsurprising when he stated: "the quality of cosmetic talc has significantly improved." This was not the case. Some cosmetic companies continued using their same talc sources.

From a medical perspective, the amount of asbestos in a product is an important consideration but one must also consider the air concentration of asbestos during product use. As noted later in this report, air sampling shows that even with talc containing less than 0.1% asbestos (by weight), significant amounts of asbestos fibers are released into the air. These levels, when associated with repeated use, have long been associated with asbestos-related illness, including mesothelioma. Moreover, the FDA has evaluated this issue and as recently as 2019 concluded that

levels well under 0.1% should not be used and do represent health concerns. In fact, levels as low as 0.00002% were found to be adulterated and should not be used.

Additionally, as shown below, even assuming 0.1% asbestos content by weight, the respirable fraction will be significantly higher.

Burn et al. relies on this flawed 1985 Risk Assessment.[Burns, 2019] The authors also outline an asbestos risk assessment of infant and adult cumulative exposure estimates with four consumer application scenarios. Even if one were to accept the authors' fiber to dust conversion factor of 1.72:1, the calculation underestimates the exposures by at least two orders of magnitude. Burns et al. assumes that only 0.1% (1 of 1000) of the fibers in an airborne sample of cosmetic talc are asbestos. Published studies, as well as data provided by Johnson & Johnson and others, demonstrate that the proportion of asbestos fibers of total fibers in talc used in cosmetic products is significantly higher.[Gordon, 2014][Steffen, 2020][Paoletti, 1984] This error in the Burns et al. risk assessment was discussed in a letter to the editor.[Finkelstein, 2019] Even a conservative adjustment for this error would place the upper bound of the cumulative asbestos exposure as estimated by Burns et al. to be 0.96 f/cc-years, a number more consistent with other published data and a level at which published data demonstrate a significantly elevated risk for mesothelioma (as discussed below).

Malignant mesothelioma results from neoplastic transformation and uncontrolled growth of mesothelial lining cells, most commonly encountered in the visceral pleura and second most commonly in the peritoneum. Normally, the mesothelium is a very slowly renewing tissue and thus it is less likely that any random DNA error would go unnoticed by the body's DNA repair mechanisms. The inflammatory injury mediated by asbestos increases mitotic activity greatly and creates an environment capable of inducing carcinogenesis. Based on genome-sequencing data, a normal adult cell cannot suddenly or spontaneously transform into a cancer cell.

Every tumor contains thousands of genetic (and epigenetic) alterations that are not present in the patient's germline (somatic mutations), but only a small fraction of these alterations occurs in "driver" (cancer-causing) genes. Mutations in only about 1% of genes in the human genome have been shown to act as driver genes for common cancers and random mutations generally encompass somatic point mutations rather than driver mutations. In solid tumors of adults, at least three driver genes are needed for a cell to evolve into an advanced cancer.

BCRA1 associated protein-1 (BAP1) is one of the known tumor suppressor genes. Somatic BAP1 mutation is a common driver for malignant mesothelioma, likely due to DNA damage caused from exposure to asbestos. There are a select number of known cases in the world of a germline (inherited), autosomal dominant BAP1 mutation. These individuals are at increased risk for several cancer types, particularly melanotic cancers, but also malignant mesothelioma and renal cell carcinoma. However, studies of this cohort and animal studies demonstrate that the risk of mesothelioma is still generally dependent on exposure to asbestos and that there is an increased sensitivity to asbestos in these individuals. The lack of BAP1 staining in tumor cells can sometimes help pathologists differentiate mesothelioma from benign tissue or other malignancies. BAP1 mutation of tumor cells cannot inform scientists of the germline status of the patient, but retained BAP1 in tumor cells excludes a germline BAP1 mutation.

Asbestos is a well-known cause of malignant mesothelioma. In fact, the causal relationship between asbestos exposure and the development of mesothelioma is so firmly established in the medical and scientific literature that it is accepted as fact. In the United States, asbestos is the major cause of malignant mesothelioma and the only epidemiologically established environmental cause of mesothelioma.

Asbestos is the only identifiable cause for most cases of malignant mesothelioma. The relationship between asbestos and mesothelioma is so strong that some consider mesothelioma a “signal” or “sentinel” tumor.[Checkoway 2004] There is wide agreement that when mesothelioma is seen, asbestos exposure is likely to have previously occurred, or conversely, when asbestos exposure has occurred, there is significant relative risk of later mesothelioma. All fiber types of asbestos are capable of inducing mesothelioma.

There is no evidence of a threshold level below which there is no risk of mesothelioma.[Hillerdal, 1999][Hodgson, 2000] Mesothelioma has been reported to occur with brief or low-level asbestos exposure. There is no completely “safe” level of asbestos exposure that has been established.[EPA, 1986] Exposure limits established by government regulations were not intended to protect from cancer. Mesothelioma is a dose-response related disease, however; the greater one’s cumulative exposure to asbestos, the greater their risk for the development of mesothelioma. Nevertheless, mesothelioma may be related to brief, low level, or indirect exposures to asbestos.[Henderson, 1997][DeVuyst, 2002][Browne, 1983] Cases of mesothelioma have been reported in the medical and scientific literature

after as little as only one day of exposure [Greenburg, 1974] and even a “slight” exposure to asbestos has been reported to result in mesothelioma.[Chen, 1978]

Epidemiological studies look at the relationship between cumulative asbestos exposure and risk of mesothelioma. Studies have demonstrated increased risk for malignant mesothelioma associated with cumulative asbestos exposures in ranges below one fiber/cc-year. For example, Iwatsubo et al. found a four-fold risk for pleural mesothelioma among workers with estimated cumulative asbestos exposures of 0.5-0.99 fibers/cc-years.[Iwatsubo, 1998] In a follow-up investigation of this national registry, Rolland and colleagues identified an almost 3-fold increased risk for malignant mesothelioma with a cumulative occupational asbestos exposure below 0.07 fibers/cc-years.[Rolland, 2006] Rodelsperger et al. found almost an eight-fold increased risk associated with an exposure of less than 0.15 fibers/cc-years and with no threshold.[Rodelsperger, 2001] Lacourt et al. reported a four-fold increased risk from exposures at or below 0.1 fibers/cc-years.[Lacourt, 2014] In a study from the Netherlands, Offermans et al. found over a doubling of the risk for pleural mesothelioma after median exposure to 0.20 fibers/cc-years.[Offermans, 2014] Ferrante et al. found over a four-fold risk for pleural mesothelioma from exposures between 0.1-0.99 fibers/cc-years.[Ferrante, 2016] Jiang et al. found over a 20-fold increased risk from exposures below 0.5 fibers/cc-years.[Jiang, 2018] The risk of mesothelioma was increased for cumulative amphibole exposures of 0.01 fiber/cc-years and even below 0.005 fiber/cc-years.[Hodgson, 2000] The EPA estimated more than a two-fold increased risk for malignant mesothelioma associated with asbestos exposures of 0.01 fibers/cc-years and OSHA estimated a 3.5-fold increased risk from exposures at 0.1 fibers/cc-years.[EPA, 1986; OSHA, 1986] There are additional studies showing elevated risk of mesothelioma with similar ranges of exposure.

Thus, scientists have repeatedly shown that cumulative exposures in ranges below 1 fiber/cc-year, 0.1 fiber/cc-year, and even 0.01 fiber/cc-year are linked to or associated with a two-fold or higher risk of mesothelioma. Moreover, the risk of mesothelioma from such exposure ranges has been corroborated throughout the medical and scientific literature and comports with the data that I have reviewed and considered as a pulmonologist.

Physicians determine causation of mesothelioma based upon the qualitative history of asbestos exposure and not upon a quantitative dose analysis of that exposure. This methodology for establishing causation of mesothelioma is widely accepted in the medical community, has demonstrated increased risk for malignant mesothelioma, and has been repeatedly published in the medical and scientific

literature. Even in the absence of markers of asbestos exposure, a history of occupational, domestic, or environmental exposure to asbestos will suffice for attribution of asbestos causing mesothelioma.[Henderson, 1997] Because there may be too many variables when considering someone's exposures to asbestos, arriving at a specific dose might not be scientifically valid. Rather, scientists and physicians will categorize exposures in terms of (1) job class (for example, "insulation worker" or "pipefitter"), (2) qualitative assessment (based on the nature, regularity, proximity, duration, and intensity of exposure), or (3) dose range estimates (based on comparisons to measurements from like exposures). Moreover, since humans have individual susceptibilities to carcinogens, there is not going to be one specific dose that affects everyone equally. This is the same qualitative approach that I and other physicians use when evaluating toxic exposures (not just asbestos) in our practices.

Latency, the time from first exposure to manifestation of disease, is prolonged in the case of mesothelioma, generally decades but can be shorter in some cases.[Lanphear 1992][Haber, 2011] Benign markers of asbestos exposure are not required to attribute asbestos as a cause of mesothelioma. Most cases of malignant mesothelioma do not also have asbestosis, and depending on the study, many, if not the majority, also do not have radiographic evidence of pleural plaquing.[Haber, 2011][Mensi, 2016][Spinazze 2022] The presence of such markers, on a probability basis, are sufficient to relate a case to asbestos.[Henderson, 1997]

All asbestos fiber types demonstrate high biopersistence in the human lung.[Feder, 2017]

With regard to fiber size, in a study on rats, Stanton et al. reported that longer ($\geq 8 \mu\text{m}$) and thinner ($\leq 0.25 \mu\text{m}$) amphibole fibers appeared to be more carcinogenic, but they did not identify a specific fiber length that had no biological activity, including fibers $<5 \mu\text{m}$ in length.[Stanton, 1981] Although longer fibers may be retained more within the lung tissues, studies have shown that shorter fibers predominate in the pleura and mesothelial tissue and ultrafine fibers (length $<5 \mu\text{m}$, diameter $<0.25 \mu\text{m}$) have less hindrance for translocation to the pleura.[Suzuki, 2002][Miserocchi, 2009] Moreover, researchers have found that in occupational environments, fibers less than $5 \mu\text{m}$ significantly outnumbered longer fibers.[Dement, 1990] Short fibers have been shown to produce toxic effects, including carcinogenesis [Yeager, 1983] and the scientific data do not support the conclusion that "short fibers" have no biological effect. Based on its review of the

published data, the interagency working group also concluded that fibers $<5\text{ }\mu\text{m}$ in length contribute to disease.[IWGACP, 2021]

Asbestos is present in ambient air, both indoors and outdoors. These “background” or “ambient” asbestos fibers are mostly (85%) composed of short ($<1\text{ }\mu\text{m}$) chrysotile fibers.[ATSDR, 2001] Only about 2% of ambient asbestos is amphibole asbestos and testing has demonstrated no background airborne anthophyllite asbestos. As reported by the ATSDR, using TEM the urban ambient asbestos airborne concentration is less than 0.00003 fibers/cc. Much of the data on ambient levels are derived from measurements taken decades ago, when asbestos was more widely used. Such exposure levels would likely overestimate the amount of asbestos that a person living more recently would expect to encounter. In fact, a recent study indicated there was no measurable asbestos in the ambient air in a major U.S. city.[Ward, 2021]

Asbestos exposures from talc use involve a range of asbestos types and lengths that are not found in the background. Additionally, exposures to asbestos from cosmetic talc use are added to a person’s cumulative exposures, including to background exposures. The background asbestos in the air is fundamentally different in (1) amount, (2) type, and (3) length than the exposures associated with talc sourced from Italy, Vermont, California, and others.

A “background” incidence of malignant mesothelioma has been estimated or suggested to be 1-2 per million/year. Other data support a much lower background level. This background level does not mean that these are unrelated to mutagen exposure. In fact, whether a background level occurring in the absence of exposure to asbestos or other mutagen truly exists is unproven. Scientists use this rate when performing epidemiological studies to help determine if a particular industry or exposure scenario is associated with a higher rate than a person in the general population. Pathology studies have shown that malignant mesothelioma prior to the industrial age was vanishingly rare to non-existent.[Strauchen, 2011][Mark, 1991]

The lack of a documented history of exposure to asbestos does not mean that the mesothelioma occurred unrelated to asbestos exposure, as many affected individuals may be unaware that they had been exposed years earlier and medical investigation of exposure sources is often lacking. It would be incorrect to assume such cases are “spontaneous.” As scientific knowledge has expanded over time, we have learned of additional sources of asbestos exposure not previously inquired about. Studies evaluating exposures in the past did not evaluate talc exposures.[Price, 2009][Spirtas, 1994][Rake, 2009][Goldberg, 2006] Much

information regarding asbestos routinely being in cosmetic talc was withheld from the public until recently.[Bird, 2021]

While men with malignant mesothelioma may outnumber women, thought related to more frequent occupational asbestos exposures, both men and women are capable of developing this malignancy. There is no biological reason to conclude that women are less sensitive to the carcinogenic effects of asbestos or that women are more likely than are men to develop mesothelioma unrelated to asbestos, including some sort of genetic predisposition. While some studies made conclusions about the etiology of mesothelioma in women as unrelated to asbestos, researchers often ignored potential exposure pathways or merely assumed that no pathway existed. Although pleural mesotheliomas outnumber peritoneal mesotheliomas in both men and women, some researchers note that women have a slightly lower pleural to peritoneal mesothelioma ratio and opine that this provides evidence of “spontaneous” mesothelioma in women, allegedly because women inhale less asbestos than their husbands who had brought asbestos home on their clothing. This ignores the obvious differences in human anatomy. Powdered substances applied to the perineal area can directly enter the peritoneum through the female genital tract.

Asbestos-related diseases are not isolated to only those occupations that have been studied. Specific exposure scenarios do not require separate epidemiological studies to make causal connections.

Once inhaled, asbestos fibers cause inflammation, injury to the cells, and genetic alterations, which can then produce a malignant phenotype progressing to malignant mesothelioma. Asbestos acts in a cumulative and dose-dependent manner in causing mesothelioma but relatively low-dose exposures to asbestos have been demonstrated to increase the risk for mesothelioma. Assessing a potential exposure source as a percentage of asbestos by weight may be misleading because even a small weight of asbestos can contain exceptionally large numbers of fibers. For example, just one gram (about one-fourth of a sugar cube) of asbestos could contain billions to trillions of asbestos fibers.

Talc is a hydrous magnesium silicate inorganic material that is mined from the earth, and is generally not a monomineralic material, but rather a mixture of mineral phases. Some of these minerals may pose occupational or even consumer risk of disease.

Asbestos is an impurity (also referred to as a contaminant or co-mineral) of some talc deposits. The type of formation associated with talc deposits involves some combination of four of the six relevant minerals: chrysotile, anthophyllite, actinolite and tremolite.

To assess if an exposure is causative in a person's cancer, I consider the presence, type, and amount of asbestos in the product and how the product use may lead to airborne asbestos fibers. For decades, I have evaluated the causation of asbestos related disease in specific patients. Whether the exposure implicates, for example, insulation, vermiculite, or gaskets, this is the type of information medical doctors routinely investigate. The same is true in evaluating talc exposures. Sources for this information can include medical and scientific publications, industrial hygiene testing, company records, regulatory data, material safety data sheets, mineralogical or geological information, and others.

It has been reported that asbestos found in talc ore is impossible to fully remove from the ore. Talc containing asbestos fibers is carcinogenic to humans and causes malignant mesothelioma. Companies made efforts to use citrus acids to burn asbestos out of the talc, float the asbestos out of the talc, or otherwise remove asbestos from the talc through reagents, ultrasonic grinding, and beneficiation. These methods did not work. Dr. Pooley, a geologist and consultant to cosmetic talc companies beginning in the 1970s admitted that "if you're producing a talc and it's got asbestos in it, no way you're going to get it out." I do not find any claims by others suggesting that asbestos can be entirely removed from the talc to be supported by any of the information I have reviewed.

I have reviewed the published literature, FDA testing, testing by cosmetic talc companies, testing by cosmetic talc company suppliers, testing by third party labs hired by cosmetic talc companies or talc suppliers, expert reports from material scientists and geologists, and more, indicating that talc source mines used by many cosmetic talc companies, including those from Italy, Montana, North Carolina, Brazil, Vermont, California, New York, Ontario, Australia, and China contained asbestos. Testing spanning decades has been positive for asbestos. I have also reviewed and relied on geological and mineralogical data regarding talc deposits to determine if the testing information is consistent with the asbestos impurities associated with the talc mine.

I have reviewed testing pertaining to the presence of asbestos in talc products, including Johnson & Johnson, Avon, Revlon, Chanel, Cashmere Bouquet, Cover Girl, Gold Bond, Coty, and others. These data provide support for my opinions.

There are hundreds of tests evidencing asbestos in talc used in cosmetic products spanning many decades from various sources, including but not limited to, talc sourced from Italy, Montana, China, Vermont, Alabama, California, North Carolina, Brazil, Korea, Australia, and Canada.

Johnson & Johnson obtained talc for its products sold in the United States from Val Chisone, Italy from 1946 to the mid-1960s, Vermont mines from the mid-1960s to 2003 (with the exception that it used Italian talc for several months in 1979-1980 during a Vermont miners' strike) and Guangxi, China from 2003 onward. Among the Vermont source mines, Johnson & Johnson used talc from the Hammondsville, Argonaut, Rainbow, and Hamm mines for its cosmetic products. In reviewing published studies and documents, I have found that talc companies and talc suppliers often referenced the talc source mine or mill with talc codes (e.g., 00000, 1615, Supra).

I critically reviewed testing and analyses of talc from the source mines, milled or processed talc, the finished product at issue and other finished products containing talc from the same source. As to Johnson & Johnson, I have reviewed hundreds of tests showing the presence of asbestos minerals and asbestos in talc from the relevant sources in Italy, Vermont, and China. Such testing and analyses spanned from the 1940s to the present from independent laboratories/scientists, government or regulatory bodies, Johnson & Johnson itself, Johnson & Johnson's consultants, and others in industry. The majority of the positive results that I have reviewed came from testing conducted outside the context of litigation. Some test results indicate that such talc did not meet the definition of cosmetic talc because, in addition to containing asbestos, it contained less than 90-95% talc.

In making my assessment, I have considered the data referenced in a document entitled "Decades of Evidence of Asbestos Content in Johnson & Johnson Products" and have verified the accuracy of each entry. This document was provided to Johnson & Johnson so the company could identify concerns regarding the accuracy or applicability of the information, and I considered Johnson & Johnson's responses.

Among the tests of Italian talc that I have reviewed, Battelle Memorial analyzed over 150 samples of Italian talc for Johnson & Johnson in the 1950s to 1960s. Virtually every sample showed the presence of tremolite. Pfizer's testing of Italian talc in the 1970s and 1980s revealed asbestos fibers in significant concentrations in about half of 234 samples. Dr. Compton found asbestos in 11 of 13 samples from

Val Chisone, Italy. MAS found asbestos, primarily tremolite asbestos, in 18 of 32 Johnson & Johnson containers with Italian-sourced talc. Both Dr. Pooley and MAS found asbestos in testing of Coty Airspun face powder containing Italian talc. In addition to MAS testing, I have reviewed a summary table of all testing done by MAS on Italian talc showing the presence of asbestos in Italian-sourced talc from five companies, spanning six decades. Testing of Avon samples containing Italian talc by MAS, McCrone, Ypma and Avon have demonstrated the presence of asbestos. Cashmere Bouquet contained exclusively Italian talc until about 1968. Testing of Cashmere Bouquet by MAS, the Colorado School of Mines, Bowling Green, Gordon, Pooley, McCrone, and others have demonstrated asbestos present. For example, Gordon et al. found asbestos in 50 of 50 samples. As of June 2021, MAS has reported on testing of approximately 91 containers of Cashmere Bouquet talc products, finding asbestos in about 87%. Of those from the 1950s to 1990s, approximately 98% contained asbestos. Many of these samples from Gordon et al. and MAS were during time frames when Cashmere Bouquet used exclusively talc from Val Chisone, Italy. Colgate testing records report asbestos in the Italian talc it used in Cashmere Bouquet. I have also reviewed a variety of other tests of Italian talc, including from Hazen Research, Ernest Fullam, MSHA and Paoletti that found the presence of asbestos. I have reviewed hundreds of samples evidencing asbestos in talc ore from Val Chisone, Italy, cosmetic grade processed talc from Italy and in finished products using cosmetic grade talc from Italy.

Evidence of asbestos in talc from the Vermont mines used by Johnson & Johnson for its cosmetic products includes testing from Battelle Memorial, McCrone Associates, the Colorado School of Mines, Johnson & Johnson/Windsor Minerals, Cyprus, Luzenac, Dr. Pooley, Dr. Langer, Dr. Blount, EMV Associates, Mountain State Research, Ernest Fullam, Hazen Research, Dartmouth University (Dr. Reynolds), University of Minnesota (Dr. Hutchins), Bain Laboratories, Forensic Analytical, Dr. Compton, and MAS. For example, McCrone repeatedly found asbestos in Johnson & Johnson's Vermont ore and finished product. In fact, in a November 1975 memorandum, McCrone reported there was a "rather high" amount of amphibole asbestos fibers in about 15 samples. Dr. Reynolds of Dartmouth told Johnson & Johnson that actinolite and anthophyllite were both present in the ore and talc product. Based on her analysis, Dr. Blount told Johnson & Johnson that its "Vermont talc contains trace amounts of asbestos." Dr. Compton analyzed 15 samples of Vermont talc, including 7 taken directly from the Argonaut mine and found asbestos in 10 of 15 samples, including 6 of the 7 from the Argonaut mine, with concentrations ranging from 1.1 to 15.3 million asbestos fibers per gram. MAS detected asbestos in 33 of 40 Johnson & Johnson containers

with Vermont ore and 8 of 15 samples of Vermont ore used to manufacture Johnson & Johnson cosmetic products.

As for talc from Guangxi, China, I have reviewed results from MAS, AMA, R.J. Lee, and others showing the presence of asbestos. Luzenac detected chrysotile in multiple Guangxi, China composite samples. In about 2009, the South Korean FDA found asbestos in 10 baby powder products containing Chinese-sourced talc. Testing for the FDA in October 2019 found asbestos in Johnson's Baby Powder containing Chinese talc. MAS has detected asbestos in virtually every sample containing such Chinese talc. MAS found asbestos in well over 100 containers of Johnson & Johnson, Chanel, and Avon products containing Chinese-sourced talc, as well as 29 ore and milled talc samples from China.

My report does not itemize all the testing I have reviewed. The relevant testing and summary documents are either listed in this report or in the attachments to this report.

The information relating to the asbestos in Johnson & Johnson's talc was not made available to the medical and scientific community for decades. For example, Johnson & Johnson never publicly produced in any case repeated tests evidencing asbestos in its talc prior to 2017. Cosmetic talc companies did not inform the FDA that they possessed test results finding asbestos in the mine ore and/or the finished talc product, nor did they provide those testing results to the FDA. An outside laboratory hired by Johnson & Johnson (McCrone) and Johnson & Johnson worked together to manipulate the asbestos testing results of Johnson & Johnson's products done by outside laboratories and reported those manipulated findings to the FDA as negative results. These are examples of efforts by cosmetic talc companies, including Johnson & Johnson, that kept the scientific community, including myself, as well as governmental regulators, from critical health information regarding a carcinogen in cosmetic talc. The FDA does not require pre-market approval for cosmetic products, nor does it have a requirement that industry testing be shared with regulators. The FDA had limited resources to evaluate cosmetic talc safety in the 1970s. In this same timeframe, industry indicated it would share its testing data with the FDA. However, repeated tests, from multiple companies including Johnson & Johnson, revealing the presence of asbestos were not shared.[Bird, 2019] Testing by or for cosmetic talc companies helps inform my opinions regarding the presence of asbestos in their cosmetic talc products. This withholding of information from regulators impacts the weight of findings by the FDA or its Acting Associate Commissioners in 1986.

Since 2017, multiple scientific and medical articles have been published identifying and discussing the dangers associated with asbestos in cosmetic talc. In 2018, the FDA formed an interagency working group comprised of subject matter experts and in 2021 published the opinions of these experts, including for testing and counting asbestos in talc. As a physician and scientist, it is a normal part of my medical practice to read and/or rely upon the testing of others, including biologists, industrial hygienists, statisticians, and other physicians.

I have also reviewed test results where no asbestos was detected, including Johnson & Johnson's discovery responses stating it had listed the entirety of the voluminous testing record concerning Johnson & Johnson's cosmetic talc products. The vast majority of such testing was limited in one or more ways, such that the testing was of limited value. In making my assessment of reliability, I have analyzed the study methodology, just as I have when evaluating published medical literature as part of my practice of medicine. As a physician and scientist, it is a normal part of my medical practice to read and/or rely upon the testing of others, including biologists, industrial hygienists, statisticians, and other physicians. A "non-detect" test for asbestos does not equate to asbestos-free.

Many tests that did not detect asbestos utilized the J4-1 testing method. This testing method utilized x-ray diffraction ("XRD") as the initial screen to determine if any further testing was necessary. The limit of detection for XRD was between 0.5% and 5%, thus enabling millions to trillions of asbestos fibers in a gram of talc to escape detection. The J4-1 method was known by industry to be unreliable for detecting asbestos in talc. In fact, the first "round robin" tests, which analyzed a CFTA tremolite-spiked talc, resulted in six of seven participating laboratories failing to detect the spiked tremolite. In other words, 86% of the industry's laboratories using the CTFA's J4-1 method failed to detect asbestos in a talc sample known to contain tremolite asbestos.

Transmission electron microscopy ("TEM" or electron microscopy) is the most sensitive tool in terms of detecting the presence of asbestos in talc, more than 10,000 times as powerful than XRD. As a physician, when selecting the appropriate test for a patient, one needs to consider the strengths and weaknesses of the tests available, even if the testing is performed by and/or interpreted by others. For example, a CT scan is a far more sensitive test for screening for lung cancer than plain chest x-ray; so much so that the data on lung cancer screening does not support the use of the chest x-ray. Nevertheless, even by chest CT a cancer can go undetected, and thus even a "negative" chest CT does not allow the physician to tell his/her patient that he/she is cancer-free. It has long been

recognized that TEM is the superior microscope to detect asbestos in talc. Laboratory consultants urged talc companies, including Johnson & Johnson, to use TEM to test for asbestos as it was far more sensitive than any other testing method.

Even where TEM was used, many tests had limitations. For instance, Johnson & Johnson used a protocol to detect and quantify asbestos in a small talc sample but report “no asbestos detected.” This protocol required the microscopist to report the presence of asbestos only if there were 5 or more fibers of the same fiber type present, thus allowing the presence of as many as 16 asbestos fibers (4 each of tremolite, actinolite, anthophyllite, and chrysotile) to be reported as “not quantifiable.” This protocol makes evaluating the underlying data critical to determine if asbestos was detected but not reported. Additionally, much of the negative testing results do not have any underlying data or very limited data to evaluate the results referenced. Other limitations even when TEM was used included lack of utilizing a concentration method, affording insufficient time for analysis, analyzing only a limited number of samples or talc volume, and/or attributing the finding of asbestos to “laboratory contamination.”

There are limits to the use of epidemiological methods when studying diseases like malignant mesothelioma, which are exceedingly rare and generally not diagnosed until many decades after the initial exposure (prolonged latency). For example, to ensure sufficient power, large numbers of individuals need to be followed for an extended period of time. Relatively small sample sizes and/or insufficient follow-up will lead to under-ascertainment of disease. Moreover, malignant mesothelioma is an aggressive cancer, with a life expectancy generally measured in months, and thus there are limitations to obtaining accurate and complete exposure histories. Researchers often must rely upon the memory of relatives or friends to reconstruct a person’s exposure history. Confirmation bias can be introduced by the nature of the questions asked that may seek information only related to known causes and fail to ascertain information on other potential causes that may be relevant. Certainly, until recently physicians and researchers were not inquiring about talcum powder usage. Many studies rely on death certificates, and prior to 1999, the International Classification of Diseases (ICD), did not have a code specific for malignant mesothelioma. As a result, deaths from mesothelioma were often recorded as other types of cancer (for instance, “pleural cancer” or “peritoneal cancer”), resulting in significant under-ascertainment of mesothelioma cases. Finally, given the persistent past detection of asbestos in the ambient air, in some cases made even higher by surrounding industry or environment, there is no truly “unexposed” group with which to compare to the studied “exposed” group. This will lead to a false lowering of the calculated risk.

Epidemiological studies of talc are limited given there have been no studies on talc end-users. Studies have shown a higher rate of malignant mesothelioma in asbestos end-users as compared to asbestos miners and therefore one cannot make assumptions of asbestos exposed end-user risk based on studies of miners and millers. Studies on talc miners and millers are also limited, are often of comparatively small numbers with low power, may have included relatively short exposure durations, may not include sufficiently long latencies, and include “healthy worker” effect. In addition, consideration must be made for the source of the talc (i.e., how it was formed). Moreover, there may be differences in exposures between miners and millers and their exposures are not necessarily comparable to those of end-users. Claims that talc miners and millers would have had greater exposures to asbestos than end-users fail to recognize important considerations. Nevertheless, a significant number of mesothelioma deaths were reported in the small cohort of Vermont miners and millers who were studied, and studies of Italian talc miners and millers have revealed increased numbers of peritoneal cancers. Industrial talc sources have been shown to have an increased risk of asbestos-related disease, including malignant mesothelioma. For example, miners and millers of industrial talc in New York have been shown to get asbestosis, lung cancer, and mesothelioma at a significantly elevated rate. Coggiola et al. reported that their results support that “excess mortality from mesothelioma...can be attributed to asbestiform fibers contained in talc exposure.”[Coggiola, 2003]

In addition to evaluating the actual talc miner and miller studies, I have reviewed documentation about Johnson & Johnson’s role and influence in those studies. Moreover, some papers have pooled miners and millers from different mines (e.g., Marsh, 2019). In each pooled study, there is no consideration whether the mines included in the pooled analysis are similar in terms of formation, or in terms of the presence, amount, or type of asbestos. Pooling randomized experimental trials can be problematic and misleading.[Green, 2011][Stroup, 2015]

I have also considered the few studies examining talc pleurodesis for non-malignant disease. These studies are looking at exposures from a different route than a person would have with cosmetic talc use, the dose from the procedure is approximately equivalent to only one day’s use of cosmetic talc (or even much less) and the source of the pharmaceutical talc used for pleurodesis in each study is unidentified. Therefore, no comparison can be made to the talc used by Johnson & Johnson. These studies are not instructive of the risk associated from inhalation of talc containing asbestos and are extremely limited because of their lack of power for detecting mesothelioma risk.

Animal studies can be helpful to scientists and physicians in understanding the pathophysiology of disease. For example, studies of rats have shown that asbestos causes malignant mesothelioma, including chrysotile, tremolite, and anthophyllite. It is important to recognize, however, that even though we know that asbestos causes mesothelioma, not all rat studies were able to demonstrate cases of mesothelioma. Johnson & Johnson has suggested their talcum powder is safe based, in part, on animal studies, however there are only two studies of their talcum powder (one Italian-sourced and one Vermont-sourced), both of which have limitations affecting their reliability. In addition to evaluating the animal studies, I have reviewed documentation about Johnson & Johnson's role and influence in those studies.

In three studies (Moline 2020, Emory 2020, Moline 2023), there were over 270 cases of malignant mesothelioma who had repeated exposures to cosmetic talcum powder (and with the majority having no other documented asbestos exposure). Of those who had tissue analysis, all of the examined tissues revealed anthophyllite, tremolite, and/or chrysotile asbestos. The combination of tremolite and anthophyllite asbestos fibers found in tissue is felt to be unique to talc and is a fingerprint for such exposure.[Moline 2020][Steffen, 2018] Others have similarly concluded that the presence of noncommercial asbestos is suggestive of prior talc use. For example, an investigation of asbestos bodies in the general population found a high percentage of anthophyllite and tremolite cores in women but none in male blue-collar workers, suggested cosmetic talc as the source.[Roggli, 1989][Churg, 1981] Other researchers have noted the link between anthophyllite ferruginous bodies and talc use.[Dodson, 2001] Gordon et al. reported mesothelioma cases in women who had intensively used talcum products, including some with no other known source of asbestos exposure. In a case report of a woman who had died from mesothelioma and whose only known exposure was to cosmetic talcum powder, tremolite and anthophyllite was found in the lung and lymph tissues as well as in bottles of the same brand of talcum powder used by the women.[Gordon, 2014] In a tissue analysis of malignant mesothelioma cases, a significant percentage of the tremolite found was attributed to talc.

When evaluating the ability of a toxin to cause harm, in addition to dose, it is necessary to assess the route of exposure. For human malignant mesothelioma, the most important route is inhalation via the lungs. From there, the asbestos can reach mesothelial tissues, including those of the pleura and peritoneum. Powdered substances applied to the perineal area can directly enter the peritoneum through the female genital tract.

It is generally accepted in the scientific community that visible dust from asbestos-containing products or materials contains large amounts of asbestos fibers that greatly exceed background ambient levels. In fact, a visible dust cloud containing as little as 0.3% asbestos would still correspond to a level in excess of 0.1 fibers/cc.[Petty, 2020] Moreover, once airborne, it may take hours to days for an asbestos fiber to settle. Once asbestos is introduced into the home, it will spread to all rooms and is almost impossible to remove, even with the vacuum cleaner.[Hillerdal, 1999] Fibers that have settled on to other surfaces in the home become re-suspended into the air by sweeping, cleaning, or other common household activities. As a result, household members may be continually exposed to asbestos in the home environment.

There is information about how much asbestos is released in the air when using cosmetic talc. I have reviewed and relied on several studies to understand the range of exposures likely experienced by talc users. The exposure range is likely 0.1-4 fibers/cc. This number is based on multiple studies that evaluate cosmetic talc exposures. The FDA reported that “the amounts of asbestos fibers dispersed by the use of talc containing more than trace amounts of this contaminant [asbestos] exceed the standards promulgated for occupational exposure.[FDA, 1972]

As with other asbestos-containing products or materials, there are studies that have examined airborne asbestos concentrations from various uses of cosmetic talc products and determined ranges of exposures. For example, in a published study by Gordon et al. of an Italian-sourced talc product, using a shaker container to apply 0.37 grams of talc to the shoulder, axilla, and upper arm area resulted in an exposure range of 1.2-2.9 fibers/cc over the course of 5 minutes. In their puff application test, using 6.25 g of talc, the exposure range was 3.5-5 fibers/cc. The short-term asbestos exposure reached a concentration of 13 fibers/cc. In a publication by Steffen et al., using a shaker container to the lower body with about 4 g of Italian-sourced talc, the 5-minute personal air sampling revealed an asbestos exposure range of 1.8-4.5 fibers/cc. In 1972, the FDA concluded that talc with above-trace levels of asbestos would produce exposures to over 5 fibers/cc. In 2018, MAS reported personal air sampling asbestos ranged from 0.8-1.9 fibers/cc for the adult and 1.5-2 fibers/cc for the baby during diapering. From below the waist usage, MAS found an asbestos range of 1.8-4.5 fibers/cc. Mattenklott reported the use of talcum powder containing less than 0.1% asbestos by weight would result in an asbestos exposure of up to 0.018 fibers/cc. Taylor reported an exposure range of 0.04-0.08 fibers/cc, assuming talc containing less than 0.1% asbestos by weight. Johnson & Johnson predicted an exposure range of 0.16-0.18

fibers/cc for diapering a baby and 4.5-9.3 fibers/cc for adult exposure using Johnson & Johnson's baby powder. For exposures during diapering, Dement et al. from NIOSH found that an adult is exposed to 2.2 fibers/cc of PCM fibers and that a baby is exposed to 1.8 fibers/cc over the course of two minutes. Finkelstein analyzed the data from Burns et al. and found concentrations ranged from 0.02 to 6 fibers/cc. Addison (1988) reported an asbestos exposure range of 1.1-2.8 fibers/cc from dust containing 0.1% asbestos. Based on data from a reconstruction model by Sahmel, of a 2013 Exponent study, talc application for 2.5 minutes resulted in an exposure of 0.30 fibers/cc. CalOSHA and Pfizer calculated a tremolite asbestos exposure of 2-4 fibers/cc based on dust from talc containing a fiber frequency of 0.19-0.4%. As noted above, a visible dust cloud containing as little as 0.3% asbestos would still correspond to a level beyond the 0.1 fibers/cc. Thus, a reasonable range of asbestos exposure from cosmetic talc use is 0.1-4.0 fibers/cc, which is tens of thousands of times above ambient, and millions of times above ambient amphibole levels. Exposures from sources of talc containing higher percentages of asbestos or depending on the use could result in a higher exposure range.

I rely on, and I have considered, the various sources of information contained and discussed in this report (including Exhibits B and C) regarding (a) the source talc in the specific products identified, when available, (b) the concentration of asbestos in the talc in the specific products identified, (c) the quantity of talc typically used during different applications of cosmetic talc products, and (d) the airborne concentration of asbestos that has been shown to result from the ordinary application of cosmetic talc products as reported in the literature and other well conducted analyses (e.g., Steffan 2020, Gordon 2014, MAS analyses, MVA analyses).

Just as I do (and the mainstream scientific community does) with other asbestos-containing products, I make a qualitative evaluation and comparison of such reported results to the exposure scenarios described, considering the described application process, the concentration of asbestos in the product, and other factors. Along with such information, I evaluate the onset, duration, frequency, regularity, intensity, nature, and proximity of exposures to each specific product, making a qualitative assessment of the exposure and dose relative to the peer-reviewed scientific literature, including epidemiological literature, on the asbestos exposures shown to cause mesothelioma. As discussed elsewhere in this report (including Exhibits B and C), the scientific community generally accepts that relatively low doses of asbestos exposure, including the ranges discussed above, can and do cause malignant mesothelioma. While this report provides some citations for the opinions

outlined, they are often only examples and additional support is included in the reference lists attached to this report.

A handwritten signature in black ink that reads "Steven E. Haber MD". The signature is written in a cursive style, with "Haber" being the most prominent part and "MD" written in a slightly different, more blocky script to the right.

Steven E. Haber, M.D., F.A.C.P., F.C.C.P.

October 27, 2023

EXHIBIT 9

Exhibit C

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