IN THE SUPERIOR COURT OF THE STATE OF DELAWARE

IN AND FOR NEW CASTLE COUNTY

IN RE ASBESTOS LITIGATION

ROLAND LEO GRENIER, SR.,	)	
	)	
Plaintiff-Appellee,	)	
	)	
v.	)	C.A. No. 05C-11-257 ASB
	)	Supreme Court Nos.: 453, 2007
	)	& 578, 2007
GENERAL MOTORS CORPORATION and FORD MOTOR COMPANY,	)	
	)	
Defendants-Appellants.	)	

Revised and Corrected: April 8, 2009*

REPORT ON REMAND
TO THE SUPREME COURT OF DELAWARE

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SLIGHTS, J.

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*Revisions only to footnote number 4.

I.

By opinion and order dated February 4, 2009, the Supreme Court of Delaware remanded this case with instructions that this Court determine whether certain erroneous factual findings set forth in its *in limine* ruling denying a defense motion to exclude expert testimony are of such a nature that the Court, upon considering the correct facts, must now conclude that the expert testimony is inadmissible.[1] To assist the Court in this review, the parties were asked to supply memoranda that addressed the following question: "Do the factual errors in this Court's December 13, 2006, opinion, as identified by the Supreme Court, require that the Court reach a different conclusion regarding the reliability and/or admissibility of Dr. Lemen's causation testimony?"[2] The Court has reviewed these memoranda, studied the record and carefully considered the Supreme Court's February 4, 2009, Opinion. For the reasons that follow, the Court remains satisfied that, notwithstanding certain factual errors in its written opinion, the Court properly determined that Dr. Lemen's general causation testimony was sufficiently reliable to be presented at trial.

II.

According to the Supreme Court's decision, plaintiff, Roland Grenier, Sr.,

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[1] *General Motors Corp. v. Grenier,* Nos. 453, 2007 & 578, 2007 (consolidated), Steele, C.J. (Del. Feb. 4, 2009)(*en banc)*(hereinafter "Supr. Ct. Op. _").

[2] D.I. 26 (Court's 2/6/09 letter to counsel).

brought suit against General Motors Corporation and Ford Motor Company alleging that exposure to asbestos contained in their automotive friction products (including brakes and clutches) caused him to develop mesothelioma, a fatal cancer.[3] At some point in the pre-trial proceedings, Mr. Grenier relied upon this judge's previous ruling denying an omnibus motion *in limine* brought by certain friction product defendants to exclude plaintiffs' expert causation testimony.[4] In denying the motion, the Court held that plaintiffs' general causation experts could testify that exposure to friction products can proximately cause asbestos-related diseases.[5] The trial judge

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[3] Supr. Ct. Op. at 2. This judge was not involved in deciding the pretrial motions or in the trial of this matter.

[4]The motion, which sought review of the plaintiffs' experts' opinions under *Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579 (1993), was presented at a multi-day hearing in late 2005 that was intended to yield a ruling that would offer guidance in more than one hundred pending friction product cases in the Delaware asbestos litigation. All parties in interest were invited to participate, including the defendants in this case. One of the purposes of handling the *Daubert* challenge to the plaintiffs' general causation case in this fashion was to address the issue efficiently and thoroughly in a single omnibus proceeding (the general asbestos litigation proceeding, C.A. No. 77C-ASB-2) so that a final resolution could occur without affecting the progress or outcome of any single plaintiff's case. After the Court's decision was rendered in May, 2006, contrary to what was stated in the Court's April 6 Report, the defendants *did* seek certification of an interlocutory appeal which this Court refused by Order dated June 7, 2006. This fact makes the procedural history of this case all the more unfortunate given that the plaintiff, who suffers from mesothelioma, initiated his claim in this court just one month after the *Daubert* hearing (November, 2005) and more than three years ago. Needless to say, the fact that the resolution of this case (one way or the other) has been delayed as a result of a legitimate need for clarity in the Court's less-than-clear *Daubert* ruling (a need which should have been evident to this Court as of June, 2006) is, to say the least, highly regrettable.

[5]*See In Re Asbestos Litig.*, 911 A.2d 1176 (Del. Super. 2006)(ruling that the causation experts who testified on behalf of the plaintiffs during the *Daubert* hearing could testify in all pending and future friction products cases). "Asbestos-related disease," as used herein, includes mesothelioma, lung cancer and asbestosis.

relied upon that ruling and allowed plaintiffs' general causation expert to testify at trial.[6] That decision then became an issue on appeal. In its opinion, the Supreme Court identified several factual errors committed by this judge in connection with the *Daubert* ruling, and instructed me to "reconsider and clarify [my] evidentiary determinations underlying [the] decision to admit the experts' opinions."[7]

A. The *Daubert* Motion

The friction product defendants' motion to exclude plaintiffs' general causation experts raised several discreet issues under the broad umbrella of *Daubert.* Among these issues was a scientific dispute over whether the chrysotile asbestos contained in friction products was different from other chrysotile asbestos. For purposes of the *Daubert* motion, all parties agreed that exposure to certain types of chrysotile asbestos fibers can proximately cause asbestos disease. Plaintiffs, through their experts, contended that the chrysotile asbestos in friction products is no less carcinogenic than other forms of chrysotile asbestos which are known to cause disease. Defendants argued that chrysotile asbestos loses its dangerous properties after being milled and subjected to the friction product manufacturing process, and

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[6]Supr. Ct. Op. at 2. Mr. Grenier's general causation expert was one of several experts who testified during the *Daubert* hearing and whose testimony the Court deemed reliable and otherwise admissible.

[7]Supr. Ct. Op. at 7.

after use. They argued further that plaintiffs' experts' opinions to the contrary were not reliable under *Daubert*. Several of the identified factual errors arose in the context of the Court's discussion of this issue.

Another discreet issue raised in the defendants' *Daubert* motion concerned the role of occupation-specific epidemiological evidence in the determination of association between exposure to friction products and risk of disease. The defendants argued that *any* scientific opinion that disagreed with purportedly prevailing epidemiological evidence was inherently unreliable. In other words, epidemiological evidence, according to the defendants, trumps all other scientific evidence on the question of association of exposure to toxic substances with disease in all instances. The plaintiffs, on the other hand, questioned the *bona fides* of the defendants' purportedly conclusive epidemiological evidence, and also questioned the validity of the premise that epidemiology trumps all other science with respect to the general causation issues in this particular case. The remaining factual errors identified by the Supreme Court arose in the context of the Court's discussion of this issue.

B. This Court's *Daubert* Opinion

In blatant disregard of the minimalist movement's credo "less is more," this Court issued a 74 page Memorandum Opinion to decide the friction defendants' *Daubert* motion. At the conclusion of its discussion of some of the key factual

controversies, this Court engaged in an unnecessary "even if" analysis in which it assumed *arguendo* that certain of the defendants' factual and/or legal allegations were accurate (e.g., that the friction product manufacturing process or use of the products affects the surface chemistry or surface charge of chrysotile fibers, and that epidemiology must support an expert's causation opinion in order to pass muster under *Daubert*), and then attempted to shore up its core conclusions by addressing these contentions. The Supreme Court's opinion identified factual errors in this Court's "even if" analyses and, in doing so, raised legitimate questions regarding the soundness of the Court's ultimate conclusion.

This Court's analytical approach in addressing the *Daubert* motion was as follows: (1) discuss the impressive credentials of the plaintiffs' proffered experts to demonstrate that they were unquestionably qualified to offer the opinions they were to give at trial; (2) address the question of whether chrysotile used in friction products was demonstrably different than other forms of chrysotile known to be carcinogenic; and (3) address the question of whether the defendants' occupation-specific epidemiological evidence was so conclusive in demonstrating a negative association between exposure to friction products and asbestos disease as to render plaintiffs' experts' opinions to the contrary *per se* unreliable.

With respect to the first prong of the analysis, the Court reviewed the experts'

credentials in some detail and concluded that they were qualified to express opinions on the general causation issues. These conclusions were never really in question at the hearing and do not appear to have been challenged on appeal in this case.[8]

On the question of the similarity between "unrefined chrysotile" and the chrysotile used in friction products, the Court determined that the plaintiffs established by a preponderance of reliable evidence that respirable chrysotile asbestos fibers remained in friction products after the manufacturing process, and that such fibers are capable of causing asbestos-related disease.[9] This determination applied to asbestos-containing friction products "out of the box," and asbestos-containing friction products that were removed from vehicles after use.[10] The Court found that these conclusions were supported *both* by a vast array of published, peer reviewed

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[8] *In re Asbestos Litig.,* 911 A.2d at 1201.

[9] *Id.* at 1202-06. As in this Court's *Daubert* opinion, the Court will again "refer to chrysotile that has not been subjected to the friction product manufacturing process as "unrefined chrysotile."' *Id.* at 1181, n. 10.

[10] *Id.* The Court notes that the evidence revealed a distinction in the theory offered by the defendants with respect to the means by which friction chrysotile fibers are rendered inert as between new and used friction products. As to new friction products, the defendants posited that the milling and binding of the fibers in a matrix (resin) made the fibers more difficult to breath into the lungs and perhaps changed the surface characteristics of the fibers. As to used friction products, the defendants posited that the extreme heat to which the products are exposed during use chemically altered the fibers in a manner that rendered them inert. While there is some basis in the evidence for the Court to have recognized this distinction in its *Daubert* analysis, since the evidence of transformation was more persuasive with respect to used friction products, the Court did not do so in its *Daubert* opinion and will not do so here. As discussed below, plaintiffs' experts presented credible evidence that respirable, unaltered chrysotile fibers remained in both new and used friction products and formulated their general causation opinions accordingly.

literature and by the direct observations and/or research of *each* of the expert witnesses who testified on behalf of the plaintiffs at the *Daubert* hearing.[11] As discussed below, regrettably, when addressing defendants' contention that friction chrysotile fibers were chemically different from other chrysotile fibers, the Court's interpretation of certain testimony from plaintiffs' expert, Ronald F. Dodson, Ph.D., who specializes in biological electron microscopy, regarding his direct observations of the chemical characteristics of friction fibers was, as noted by the Supreme Court, not supported by the record.

Finally, with respect to the primacy of epidemiology in the general causation determination, the Court determined that the defendants' occupation-specific epidemiological evidence was "equivocal" and that the plaintiffs' scientific evidence (which included epidemiological studies showing a positive association between chrysotile and disease) was sufficiently reliable to be presented to a jury at trial. In the course of considering this issue, in language that clearly should have been more direct, the Court observed that judges typically are ill-equipped to provide a *definitive* resolution of scientific disputes among competent scientists.[12] After considering the

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[11] *See e.g. Id.* at 1202, n. 161-164; *Id.* at 1203-06 (recounting testimony of Drs. Lemen, Dodson, Hammar and Frank and the peer reviewed studies relied upon by each).

[12] *Id.* at 1210 ("Equipped with an advanced degree in science and years of training and experience in the field of epidemiology, perhaps the Court could act as arbiter of this dispute between well-credentialed camps of scientists and conclusively proclaim whether or not Chrysler's

competing evidence, the Court concluded that the plaintiffs could present all of their scientific evidence at trial,[13] including their epidemiological evidence and their non-epidemiological evidence of an association between exposure to friction products and asbestos disease, and that the friction product defendants could counter that evidence with vigorous cross examination and with their contrasting occupation-specific epidemiological evidence.[14] In reaching this conclusion, the Court again, regrettably, erroneously interpreted certain aspects of the testimony of plaintiffs' epidemiologist, Richard A. Lemen, Ph.D., regarding his methodology and the evidence upon which he relied to form his ultimate opinions.

C. The Supreme Court's Remand Opinion

In its remand opinion, the Supreme Court identified certain factual errors in

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epidemiological evidence is reliable and definitive. An undergraduate political science degree coupled with a law degree, however, hardly qualifies the Court to undertake this exercise."). The Supreme Court, understandably, read this feeble attempt at humor as an expression of concern by this judge that he might not be up to acting as arbiter of the *Daubert* dispute *sub judice,* i.e*.,* that the Court might not be up to performing its mandated gate keeping function. Supr. Ct. Op. at 7, n. 7. That was not this Court's intent. Rather, the Court was attempting to extol the wisdom of the generally accepted proposition that "it is not necessary that the judge decide the admissibility of scientific evidence with the degree of certainty required in scientific circles." *Id.* at 1200, n. 146 (citing *Bowen v. E.I duPont DeNemours & Co.,* 2005 WL 1952859, at *8-9 (Del. Super.), *aff'd,* 906 A.2d 787 (Del. 2006)). Unfortunately, this important aspect (and limitation) of the Court's mandated gate keeping function under *Daubert* was lost in the imprecise language employed in this Court's opinion.

[13] The plaintiffs' scientific evidence included epidemiology (relating to chrysotile asbestos), case reports, animal studies, tissue burden studies, mechanistic studies and the direct clinical and laboratory observations of their experts.

[14] *In Re Asbestos Litig.*, 911 A.2d at 1211.

this Court's *Daubert* opinion and directed the Court to take account of these errors in order to determine: (1) "whether ... Dr. Dodson's opinion is sufficiently reliable" for Dr. Lemen to have relied upon it in reaching his own opinions; and (2) whether the "erroneous factual findings [with regard to Dr. Lemen's opinions] colored [the] ultimate decision to admit Dr. Lemen's general causation opinion."[15] The Court appreciates this opportunity to review and clarify its *Daubert* determination in keeping with and limited by the direction of the Supreme Court's remand.[16]

III.

A. Dr. Dodson's Opinion Was Sufficiently Reliable To Pass Muster Under *Daubert* And Dr. Lemen Properly Relied Upon It In Reaching His Own Opinions

1. The Erroneous Interpretations of Dr. Dodson's Testimony

As stated, all of the general causation experts who testified at the *Daubert* hearing on behalf of the plaintiffs ultimately concluded that, when considering whether exposure to friction products can cause asbestos-related disease, there is no scientifically valid reason to distinguish between unrefined chrysotile and chrysotile that has been subject to milling and the friction product manufacturing process. To reach this conclusion, plaintiffs' epidemiologist, Dr. Lemen, the only general

[15]Supr. Ct. Op. at 11, 14.

[16]The Court has reviewed its *Daubert* decision and the evidentiary record in its entirety, but has paid particular attention to the limited issues identified in the Supreme Court's remand opinion.

causation expert who testified at trial for Mr. Grenier, relied in part upon the work and opinions of other experts, including Dr. Dodson. Because this Court determined that Dr. Dodson's testimony offered Dr. Lemen a "bridge" over which he could reach the conclusion that there was no significant difference between "unrefined chrysotile" fibers and friction product chrysotile fibers, the reliability of Dr. Dodson's testimony was at issue in the Supreme Court's review of this Court's *Daubert* decision.[17]

The first factual error identified in the Supreme Court's opinion concerned this Court's characterization of Dr. Dodson's testimony on the unrefined chrysotile versus friction product chrysotile issue. Specifically, the Supreme Court determined that the following characterization of Dr. Dodson's testimony was erroneous:

> "In addition to looking at the size and amount of chrysotile fibers released from friction products, **Dr. Dodson also considered the surface characteristics of the fibers and concluded that there is no basis to distinguish the surface characteristics of friction fibers from those of other chrysotile fibers.**"[18]

The Supreme Court pointed to the following excerpt of Dr. Dodson's testimony

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[17] *In Re Asbestos Litig.*, 911 A.2d at 1204.

[18] Supr. Ct. Op. at 9 (*citing In Re Asbestos Litig.,* 911 A.2d at 1203 (emphasis supplied)). This Court's citation to the record to support this statement, set forth in footnote 167 of the opinion, clearly was in error. The initial record citation is to a transcript page that contains a portion of counsel's opening statement, not Dr. Dodson's testimony. *See* D.I. 2682 at 29 (10/17/05 a.m.). The subsequent transcript pages cited in footnote 167 relate to introductory matters in Dr. Dodson's testimony. *Id.* at 36-37, 59. Upon review, it is evident that the Court intended to cite to the afternoon session of Dr. Dodson's testimony, as set forth in D.I. 2683.

at the *Daubert* hearing to reveal the error:

> Q: And in the fibers that you analyzed, again, you weren't able to, or you didn't undertake to try to analyze the surface charge or the surface chemistry? [. . . .]
>
> A: No, sir.[19]

The next error identified by the Supreme Court also concerned this Court's characterization of Dr. Dodson's testimony. When discussing its conclusion that plaintiffs' experts did not distinguish between unrefined chrysotile and chrysotile in friction products, the Court interpreted Dr. Dodson's testimony to mean that "he would have detected changes in surface characteristics under (transmission electron) TEM microscopy."[20] The Supreme Court determined that this characterization of Dr. Dodson's testimony was erroneous for two reasons. "First, because Dr. Dodson admitted that he did not attempt to analyze the surface characteristics of the fibers that he studied, it is irrelevant whether Dr. Dodson 'would have detected changes in surface characteristics under TEM microscopy.' Second, even if he had analyzed the surface characteristics of the fibers, Dr. Dodson acknowledged that 'TEM microscopy allows only for the detection of *some* alterations in *some* surface characteristics."[21]

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[19]Supr. Ct. Op. at 9.

[20]*Id.* (citing *In re Asbestos Litig.,* 911 A.2d at 1203, n. 167).

[21]*Id.* (emphasis in original).

The Supreme Court explained that the errors are relevant because both Dr. Dodson and Dr. Lemen "acknowledged that surface characteristics affect the carcinogenicity of the fibers."[22]

The third identified error again concerns Dr. Dodson's testimony. And, again, the error relates to the Court's characterization of Dr. Dodson's conclusions regarding the surface characteristics of friction fibers. In its *Daubert* opinion, this Court stated: "And, although Dr. Dodson acknowledged that he could not confirm what occurs biologically or chemically (i.e. surface charge or surface chemistry) when lung or pleura tissue comes into contact with a friction fiber, even Chrysler concedes that 'no one can describe the factors that make any fiber carcinogenic."[23] In support of this finding, this Court cited to testimony of Dr. Dodson which, according to the Supreme Court, "[did] not support th[e] finding."[24]

2. The Erroneous Interpretations Of Dr. Dodson's Testimony Do Not Cause The Court To Change Its View Regarding The Reliability Of His Opinions

In each instance noted above where the Court erroneously characterized Dr. Dodson's testimony, the Court was attempting to address the defendants' contention

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[22] *Id.* at 10.

[23] *Id.* at 10-11 (quoting *In Re Asbestos Litig.,* 911 A.2d at 1203).

[24] *Id.* at 11.

that demonstrable changes in the surface charge and/or surface chemistry of friction asbestos fibers explained the phenomenon whereby unrefined chrysotile fibers were carcinogenic but friction chrysotile fibers were not. This discussion, which appears at page 1203 of the *Daubert* opinion, follows the Court's discussion of Dr. Dodson's own research and review of peer reviewed literature from which he determined that the morphology (form and structure**)**, size and shape of asbestos fibers, were the primary factors that explained the "carcinogenicity" of asbestos, including chrysotile.[25] Significantly, in his studies, Dr. Dodson was able to observe, in samples from unused brakes, *both* fibers that were bound in resin and potentially not respirable *and* unbound, respirable fibers that he readily identified as chrysotile fibers.[26] In samples washed from used clutches, among other materials, he was able to observe both long and short fibers that, again, he readily identified as chrysotile fibers.[27] The significance of these studies, of course, is that Dr. Dodson, relying upon

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[25] *See In Re Asbestos Litig.*, 911 A.2d at 1184, 1202. *See also* D.I. 2682, at 133-34 (10/17/05 a.m.); D.I. 2683 at 5-7, 16-17, 26-29, 35-37, 43-44, 55-59, 104-05 (10/17/05 p.m.); PX 167 (published article of Dr. Dodson's study of unused friction products); DX 257, 258 (same with respect to used friction products); PX 195 (published article of Dr. Dodson's analysis of fiber burden studies in mesothelioma patients exposed to chrysotile); PX 205 at 264 ("[f]irst, it has long been recognized that it is not the chemical composition of the various asbestos fibers that is important in their ability to produce disease, the health effects of asbestos are related primarily to their morphology, their shape and size.").

[26] D.I. 2683 at 31-37, 39 (10/17/05 p.m.).

[27] *Id.* at 27-29.

his own work and the peer-reviewed work of other scientists, was able to conclude that while new and used friction products may release altered, possibly inert fibers, they also release toxic fibers known to Dr. Dodson to be chrysotile fibers.[28] Dr. Dodson's opinion that friction products released respirable chrysotile fibers was echoed by each of the other experts who testified on plaintiffs' behalf at the *Daubert* hearing, and by published, peer reviewed literature.[29]

The defendants posited a hypothesis that changes in surface chemistry or surface charge occurred in all respirable chrysotile fibers during or as a result of the friction product manufacturing process. As the Supreme Court found, plaintiffs' experts concurred that "surface characteristics affect the carcinogenicity of the fibers."[30] In its *Daubert* opinion, this Court did not account for this testimony and place it in proper context. Contrary to the suggestion in the *Daubert* opinion that

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[28] *Id.* *See also* D.I. 2683 at 28-29, 32-33, 35-39, 40-42, 44 (10/17/05 p.m.)(Dr. Dodson explains his own studies revealing that binding chrysotile asbestos with matrix within friction products does not alleviate the release of respirable chrysotile fibers during installation or when removed after use).

[29] *See e.g.* D.I. 2684 at 78-80, 85-88 (10/18/05 p.m.)(Dr. Lemen); D.I. 2342 at 29,32 (10/18/05 a.m.) (Dr. Hammar); D.I 2685 at 96-100 (10/19/05)(Dr. Frank); D.I. 2684 at 88-89 (10/18/05 p.m.)(Dr. Lemen discusses the Faigout study from 1985 that discussed release of asbestos fibers from ground brakes); D.I. 2683 at 40-41 (10/17/05 p.m.)(Dr. Dodson discusses studies by Jacko and Rohl finding "free chrysotile" within material purported to be forsterite); PX 16, 306 (Rohl studies); PX 13 (Lynch study noting that some "asbestos escaped as free fiber" from brake linings after use); PX 292 (Paustenbach study summarizing other studies that found chrysotile fibers in worn brakes).

[30] *See* Supr. Ct. Op. at 10 (citing testimony of both Drs. Dodson and Lemen to this effect).

plaintiffs' experts (including Dr. Dodson) had considered the defendants' hypothesis and had definitively proven it false, the record reflects that plaintiffs' experts considered the hypothesis and found no credible evidence in the scientific literature or elsewhere to support it. Their conclusions that chrysotile fibers released from friction products were no less carcinogenic than unrefined chrysotile fibers, therefore, was not based on conclusive scientific evidence that directly supports the conclusion, but rather was based on overwhelming and incontrovertible evidence that chrysotile asbestos causes disease, friction products contain chrysotile asbestos as a component part, and the lack of any valid scientific evidence that friction products (either before or after use) no longer contain toxic chrysotile fibers.[31] Significantly, while it is true that neither Dr. Dodson nor any of plaintiffs' other experts had uncovered conclusive evidence that the surface charge or surface chemistry of friction fibers were unaltered, after years (if not decades) of professional study dedicated to researching the health

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[31] *See supra,* at fn 25-29. *See also* D.I. 2684 at 78-81 (10/18/05 p.m.)(Dr. Lemen discusses NIOSH study indicating the chrysotile survives friction product manufacturing process); PX 16 (Rohl study testing samples from brake drums and noting that: (p. 113) - "Therefore, brake lining disintegration may liberate partially altered, or unaltered, chrysotile fibers."; (p. 126) - "The presence of chrysotile asbestos in the ten dust samples was further verified by transmission electron microscopy, selected area electron diffraction and electron microprobe analyses. Chrysotile was found, both in fiber and fibril form, with unaltered structure and chemical composition."). Even the article principally relied upon by the friction defendants in support of their hypothesis, Langer's 2003 article (PX 252), acknowledges that the notion that changes in surface characteristics and chemistry occur during the friction product manufacturing process is, actually, a hypothesis (at p. 72), and confirms that exposure to unaltered fibers can occur while installing asbestos-containing brakes (at p. 76).

risks of asbestos exposure, they also had found no evidence that these characteristics *were* altered in all of the fibers release from new or used friction products.[32] The Court now appreciates that its *Daubert* opinion did not make this critical point clear enough and trusts that it has expressed the point more clearly herein.

A review of Dr. Dodson's testimony in light of the Supreme Court's Remand has satisfied the Court that it properly determined that his opinions were sufficiently reliable to be presented to a jury at trial. The Court is also satisfied that it properly concluded that Dr. Lemen could rely upon Dr. Dodson's opinion in reaching his own opinions.

3. Dr. Lemen Needed No Bridge To Reach His Opinions

Upon review of the record and the *Daubert* opinion anew in light of the Supreme Court's remand, the Court is concerned that it may have placed too much emphasis on the opinions of Dr. Dodson, and the "bridge" they offered to the other experts to reach their own opinions, without giving due regard to the methodologies and opinions of each of plaintiffs' experts in their own right. Of particular relevance in this instance is the opinion of Dr. Lemen, the lone general causation expert to testify in the *Grenier* trial. While it is accurate to say that Dr. Lemen relied upon the research

[32]*See e.g.* D.I. 2683 at 43-46 (10/17/05 p.m.)(Dr. Dodson); D.I. 2343 at 113-120 (10/19/05 a.m.)(Dr. Lemen).

of Dr. Dodson in forming his own general causation opinions, Dr. Dodson was not the only "bridge" that allowed Dr. Lemen to reach these opinions.[33] Dr. Lemen's own research regarding the manufacture and service of friction products (particularly brakes) allowed him to obtain reliable data upon which to opine how brake workers are exposed to asbestos during the installation and removal of asbestos-containing brakes.[34] Dr. Lemen also properly relied upon other published studies to support his conclusion that friction products can release "free" and "unaltered" "chrysotile fibers,"[35] including the work of Drs. Langer and McCaughey and reports from the World Health Organization and the World Trade Organization.[36] His own research, coupled with his reference to other peer-reviewed scientific data, provided ample bases for Dr. Lemen to conclude that respirable chrysotile fibers could be released

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[33]To be clear, the Court remains satisfied that Dr. Dodson's review of peer-reviewed literature, his own studies of new and worn friction products, and the fiber burden studies he conducted, all provided meaningful evidence upon which to base a scientific conclusion that friction products can, when serviced, release respirable chrysotile asbestos that is capable of causing disease. *See In Re Asbestos Litig.,* 911 A.2d at 1184 (citing Dr. Dodson's testimony and PX 167; PX 195; PX 258).

[34]*See Id.* at 1191-92 (citing, *inter alia,* D.I. 2684 at 78-80 (10/18/05 p.m.); D.I. 2343 at 103-110 (10/19/05 a.m.); PX 1 (Dr. Lemen's peer-reviewed paper entitled *Asbestos in Brakes: Exposure and Risk of Disease* wherein he addressed several other studies upon which he relied)).

[35]*See* PX 248 at p. 1102 (Langer study noting "besides the submicroscopic chrysotile fibre in brake drum housing there is a more significant source of free, unaltered fibre in the beveling, refurbishing and refitting of brake pads.").

[36]*See* D.I. 2342 at 85-88 (10/18/05 a.m.); D.I. 2684 at 49 (10/18/05 p.m.); D.I. 2685 at 21-22 (10/19/05 p.m.); PX 1 (citing several studies); PX 235, 350 (WHO reports); PX 351 (WTO report).

from friction brakes out of the box when installed, and from friction brakes as they were being removed from vehicles after use. And, like Dr. Dodson, he was aware of no reliable scientific data upon which to conclude that the chrysotile released from new and used friction brakes would be any different, or any less toxic, than the chrysotile that has been conclusively proven to cause disease.[37]

B. The Court Remains Satisfied That It Properly Determined That Dr. Lemen's Opinions Were Reliable As Required By *Daubert*

1. The Erroneous Interpretations of Dr. Lemen's Testimony

In addressing the question of whether the plaintiffs' experts had properly reconciled their general causation opinions with purportedly conclusive occupation-specific epidemiology that supported a negative association between exposure to friction products and disease, the Court discussed at some length the methodology of plaintiffs' lone epidemiologist, Dr. Lemen, and the bases upon which he rested his opinions. In doing so, the Court made certain factual errors, as discussed below.

The fourth factual error identified by the Supreme Court was this Court's conclusion that Dr. Lemen's "use of the Bradford Hill criteria to reach his conclusion

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[37] *See* D.I. 2343 at 113-116 (10/19/05 a.m.)(after he had described at length throughout his direct testimony his indisputably exhaustive research regarding asbestos and asbestos exposure, Dr. Lemen testified on cross examination that he was aware of no evidence that would support a hypothesis that the friction product manufacturing process or the use of friction products would cause "any changes in the [chrysotile] fiber" that would be released during service and offered to review and comment on any evidence presented to him that might support that hypothesis).

that exposure to friction products increases the risk of asbestos disease reflects an appreciation for and adherence to a sound scientific methodology."[38] The Supreme Court found that this observation "misconstrued Dr. Lemen's testimony" because "Dr. Lemen did not directly apply the Bradford Hill considerations to the question of whether exposure to chrysotile fibers ***from friction products*** causes mesothelioma and the other asbestos related diseases; rather, Dr. Lemen only applied the criteria with respect to general chrysotile."[39]

The next error identified by the Supreme Court related to this Court's failure to account for the fact that Dr. Lemen's opinion that exposure to friction fibers can increase the risk of developing an asbestos related disease was based on an assumption that "the fibers that are released [from friction products] have the same biological ability or biological propensities as chrysotile fibers that were studied in other areas."[40] The Supreme Court continued: "Despite Dr. Lemen's admitted assumption, the motion judge concluded that even if the plaintiffs did not reliably establish that the chrysotile fibers from friction products are physically and chemically indistinguishable, the plaintiffs offered sufficient evidence to establish that exposure to friction products can

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[38]Supr. Ct. Op. at 12 (quoting from *In Re Asbestos Litig.,* 911 A.2d at 1204).

[39]*Id.* (emphasis in original).

[40] *Id.* at 13.

cause lung disease."[41]

After considering the evidence presented at the *Daubert* hearing, this Court rejected the defendants' position that their occupation-specific epidemiological evidence established beyond any question that exposure to friction products did not/could not increase the risk of contracting an asbestos related disease. In doing so, the Court noted that both Dr. Lemen and Dr. Hammar had relied upon epidemiological evidence out of Australia that "supports an association between exposure to friction products and asbestos diseases."[42] The Supreme Court determined that this finding was contrary to Dr. Lemen's testimony at the *Daubert* hearing where he agreed that "none of [the epidemiological studies] have demonstrated a positive association between friction product exposures and mesothelioma."[43]

2. Dr. Lemen Employed Reliable Methodology

a. The Bradford Hill Considerations

To be sure, Dr. Lemen did not testify that he employed the Bradford Hill considerations directly to the question of whether exposure to chrysotile from friction

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[41] *Id.*

[42] *Id*. (quoting *In Re Asbestos Litig.,* 911 A.2d at 1210).

[43] *Id.* at 14.

products causes disease.[44] The suggestion that he did so in the Court's *Daubert* opinion stretched his testimony too far. Dr. Lemen did, however, apply Bradford Hill to the question of whether exposure to chrysotile can cause disease and explained that process at length in his testimony.[45] While the record may well have supported an inference that Dr. Lemen actually did apply Bradford Hill considerations to reach his conclusion that exposure to chrysotile from friction products causes disease (e.g. by drawing "analogies" to data regarding other chrysotile exposures, referring to his own and other experimental evidence, and relying upon the "consistency" of such data, etc.), he was not asked that question directly and it was improper for the Court to assume strict adherence to a methodology absent direct confirmation from the scientist at issue.

Nevertheless, given the unique posture of the question Dr. Lemen was being asked to address, his adherence to Bradford Hill with respect to the question of association between exposure to chrysotile and development of disease is really what is important in the final analysis. Dr. Lemen employed sound methodology (including Bradford Hill) to conclude that exposure to chrysotile causes disease. He conducted

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[44]As explained by Dr. Lemen, the Bradford Hill considerations are nine different "criteria" that "an epidemiologist should consider when looking at associations." D.I. 2684 at 34-35 (10/18/05 p.m.). *See Federal Reference Manual on Scientific Evidence*, at 375-76 (2d Ed. 2000)(explaining Bradford Hill considerations).

[45]D.I. 2684 at 34-52 (10/18/05 p.m.)(Dr. Lemen reviews all nine criteria in detail).

research to determine that friction products contain significant amounts of chrysotile asbestos, and conducted further research to conclude that working with friction products (both in the installation and removal of the product) can release respirable chrysotile fibers in amounts sufficient to cause disease. He was aware of no credible evidence to support a hypothesis that all chrysotile fibers were rendered inert by the friction product manufacturing process and/or by use in friction products. The epidemiology that supported the positive association between exposure to chrysotile and asbestos diseases, and the means by which Dr. Lemen considered that evidence and incorporated it into his general causation opinions in this case, did, therefore, reflect "an appreciation for and adherence to a sound scientific methodology."[46]

b. Dr. Lemen's "Assumption"

It is correct to say that the defendants were successful in obtaining from Dr. Lemen over two days of testimony a single apparent admission that his opinions were based on an "assumption" that "the fibers that are released [from friction products] have the same biological ability or biological propensities as chrysotile fibers that were studied in other areas."[47] If this was Dr. Lemen's only testimony on the question of whether friction chrysotile fibers were the same or different from unrefined

[46]*In Re Asbestos Litig.,* 911 A.2d at 1204.

[47]Supr. Ct. Op. at 13.

chrysotile fibers, the Court might have cause to retract its earlier decision and to strike Dr. Lemen's testimony as unreliable. But that is not the state of this record. As discussed above, time and again, the plaintiffs' experts, including Dr. Lemen, testified that they had exhaustively researched the available data that addressed the question of whether exposure to asbestos-containing friction products can cause disease and throughout that data they found no reliable evidence to support a hypothesis that all fibers released from friction products were somehow structurally or chemically different from unrefined chrysotile fibers in a manner that would render them incapable of causing disease. As discussed below, since Dr. Lemen's "assumption" was based on an absence of reliable evidence within a large fund of scientific data, it was a well founded assumption upon which he was entitled to rely.

3. The Court Stands By Its Assessment Of The Role Of Epidemiology In Establishing An Association Between Exposure To Chrysotile In Friction Products And Disease

The Supreme Court is correct; Dr. Lemen did acknowledge that none of the epidemiological studies "*demonstrated"* a positive association between exposure to friction products and disease. He did, however, refer to the epidemiological data from the Australian Tumor registry and did note that, despite significant shortcomings (a phenomenon that plagued all of the epidemiology presented by both parties), the study

did report "an exceptionally high risk" of disease among automobile mechanics.[48] The data, albeit equivocal, did *"support"* his conclusions regarding general causation. In the totality of the evidence upon which he relied, however, the Australian epidemiology was "not given very much weight."[49] To the extent this Court's *Daubert* opinion gave a different impression, it was one not supported by the record.

Here again, the Court got caught up trying to make a gratuitous "even if" point when it referred to the experts' consideration of the Australian epidemiological data- - in essence making the point that even if epidemiology is required to support a positive association, there is epidemiology that supports the association at issue here.[50] The Court engaged in this discussion notwithstanding its earlier and principal conclusion that occupation-specific epidemiology was "*not* required as a matter of law" to make the case that chrysotile from friction products causes disease.[51] In reaching this conclusion, the Court addressed at some length the significant "confounders" that plagued the defendants' occupation-specific epidemiology.[52] The Court also explained

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[48]D.I. 2684 at 109 (10/18/05 p.m.).

[49]D.I. 2343 at 73 (10/19/05 a.m.).

[50]*In Re Asbestos Litig.,* 911 A.2d at 1210.

[51]*Id.* at 1206 (emphasis supplied).

[52]*Id.* at 1207-10. Even the defendants' expert, Dr. Michael Goodman, acknowledged that each of the studies that comprised his meta-analysis were affected (but not invalidated) by confounding factors. *See e.g.* D.I. 2344 at 87, 95, 105, 115 (10/20/05 a.m.).

that epidemiology plays a less important role in establishing positive association with disease in the context of asbestos exposure where the background rate for disease is so low and the resulting diseases (asbestosis and mesothelioma) are "sentinel diseases."[53] And, of course, the Court found that the abundant epidemiological evidence of a positive association between exposure to chrysotile and asbestos disease was relevant to the general causation opinions offered by each of plaintiffs' experts.[54]

Ultimately, the Court concluded that the body of occupation-specific epidemiological evidence, both positive and negative, was "equivocal."[55] Given the Court's earlier conclusion that the scientific data revealing a positive association between exposure to chrysotile and asbestos disease (including epidemiology) was relevant to prove the association between exposure to friction fibers and disease, and the principled disagreement between two "well-credentialed camps of scientists" with respect to the meaning and importance of the occupation-specific epidemiology, the Court determined that it would not decide who was right and who was wrong in the dispute but would instead allow the parties to present their scientifically sound

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[53] *Id.* at 1209 n. 202 (discussing background levels), 1210 (referring to Dr. Lemen's discussion of the diminished role of epidemiology with respect to "rare" asbestos related diseases).

[54] *Id.* at 1208.

[55] *Id.* at 1209. The need for occupation-specific epidemiology was also legitimately called into question given the overwhelming evidence that exposure to chrysotile in any occupation creates the risk of disease. *See e.g.* D.I. 2684 at 52-60 (10/18/05 p.m.).

methodologies and conclusions to the jury for resolution.[56] The Court has reviewed this conclusion and remains satisfied that it is supported by the factual record.

C. The Court's *Daubert* Opinion May Have Unwittingly And Improperly Suggested That Plaintiffs Were Obliged To Satisfy An Enhanced Burden Of Proof

The Supreme Court offered a window into its principal motivation for remanding this case when it observed " an expert's methodology must be not only reliable intrinsically but also be reliably applied to the facts of the specific case...."[57] The cases upon which the Supreme Court relied to support this observation included *Hudgens v. Bell Helicopters,*[58] in which the Eleventh Circuit Court of Appeals held that "an expert's failure to explain the basis for an important inference mandates an exclusion of his or her opinion."[59] From this Court's perspective, the application of this aspect of the Court's gate keeping function is at the heart of both the underlying *Daubert* dispute and the Supreme Court's remand.

As best as the Court can discern, for purposes of their *Daubert* motion, the defendants did not dispute that plaintiffs' evidence demonstrated that exposure to

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[56] *Id.* at 1210.

[57] Supr. Ct. Op. at 11.

[58] 328 F.3d 1329 (11th Cir. 2003).

[59] *Id.* at 1344.

chrysotile causes disease. The defendants also did not dispute that friction products contain chrysotile as a component part.[60] The evidence demonstrated that mechanics can be exposed to respirable dust while working with both new and used friction products.[61] Where the parties crossed swords was on the question of whether that dust contained chrysotile fibers in a form that could cause disease.

Each of the plaintiffs' proffered experts, including Drs. Dodson and Lemen, testified at length about their exhaustive review of available data on the question of whether all friction fibers were significantly different from other chrysotile fibers known to cause disease. They did so because the defendants offered two hypotheses to counter the plaintiffs' evidence of a positive association between exposure to chrysotile in friction products and disease: (1) that the friction product manufacturing process altered the surface charge or surface chemistry of the chrysotile fibers in a manner that rendered all fibers in new friction products inert; and (2) the use of friction products converted all of the chrysotile asbestos contained therein into an inert

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[60] *In Re Asbestos Litig.,* 911 A.2d at 1180 ("For purposes of the motion *sub judice*, the parties agree that the automotive friction products at issue contained chrysotile asbestos and that exposure to chrysotile asbestos can cause asbestos-related diseases.").

[61] *See e.g. Id*. at 1184, 1186, 1189-90 (discussing Dr. Dodson's study of lung tissue of auto mechanic, Dr. Hammar's review of peer reviewed literature documenting disease in individuals whose only known exposure to asbestos was exposure to friction products, and Dr. Lemen's own research and review of other peer reviewed research indicating that friction products release respirable chrysotile asbestos fibers).

substance called forsterite.[62] As discussed above, Drs. Dodson and Lemen conducted their own research, the results of which indicated that respirable chrysotile fibers of the same quantity, shape, size and morphology of fibers known to cause disease were released from new and even used friction brakes. They also considered peer reviewed literature that supported this conclusion. And while they concurred with the notion that a change in surface charge or surface chemistry could affect the carcinogenicity of the fibers, they also stated unequivocally that they were unaware of any credible evidence to support the hypotheses that such changes, in fact, occur in *all* fibers released either from new or used friction products. For his part, Dr. Lemen even offered to consider from the witness stand any supporting evidence the defendants might present to him. Despite defense counsel's indication that he would "do that in just a minute," the evidence was not forthcoming.[63] Thus, when the evidence at the

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[62]Of course, in the absence of the hypotheses, there would have been no need for a *Daubert* hearing given the defendants' admissions that friction products contain chrysotile as a component part and that chrysotile can cause disease.

[63]D.I. 2343 at 115 (10/19/05 a.m.). The primary study supporting the defendants' hypothesis, the 2003 Langer study, offered no conclusive data and ultimately concluded that "the attention of a dust control engineer and industrial hygienist" was "required" during the installation of friction brakes. PX 252 at 76. The following exchange between defense counsel and Dr. Lemen, after a discussion of another study (Valentine) suggesting that changes in the surface characteristics of friction fibers might occur at higher temperatures, illustrates the hypothetical nature of the defendants' position throughout the *Daubert* proceedings in this case: "Q. Just so we're clear, I'm not asking you based on that study or *any of the other studies* we may talk about in the next few minutes to conclude that there is affirmative proof that friction fibers are rendered inert. That's not what I'm asking you to do. A. Well, there is no proof of that. D.I. 2343 at 118-19 (10/19/05 a.m.).

Daubert hearing closed, the plaintiffs' experts had rejected the defendants' hypotheses as lacking in positive proof but they had not, themselves, disproved them.[64]

The Court properly placed the burden of establishing the reliability and admissibility of each aspect of the plaintiffs' experts' opinions on the "proponent" of the opinions.[65] Thus, it fell to the plaintiffs to prove by a preponderance of the evidence that their "experts have employed a reliable methodology in reaching the conclusion [that exposure to friction products can cause disease]."[66] Upon review of its *Daubert* opinion, and the Supreme Court's remand opinion, the Court is now concerned that by suggesting that Drs. Dodson and/or Lemen had disproved the "friction fibers have different surface charge or surface chemistry" hypotheses, the Court may have unwittingly and improperly suggested that an enhanced burden of proof was in play. Although not as clearly stated as it should have been in the Court's

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[64]The Court acknowledges, as did plaintiffs' experts (*e.g.* PX 1 at 229-30), that there are data in the published literature that justified asking the question of whether the friction product manufacturing process and/or the heat generated during use of friction products changes the surface characteristics of friction fibers. *See e.g.* DX 185; PX 252 (Langer studies); DX 357 (Valentine study). As discussed above, however, Drs. Dodson and Lemen determined, based on the observations and findings of the scientists conducting the studies, and their own interpretation of the data, that the notion that all chrysotile fibers were rendered inert either by manufacture or use of friction products was not proven or even supported by these studies. *See* D.I 2343 at 106-19 (10/19/05 p.m.)(Dr. Lemen discussing these and other studies); D.I. 2683 at 40-45 (10/17/05 p.m.)(Dr. Dodson addressing studies).

[65]*In Re Asbestos Litig.,* 911 A.2d at 1200 (citations omitted).

[66]*Id.* at 1201.

initial *Daubert* opinion, the Court concluded then and reiterates now that plaintiffs were not required to disprove the defendants' hypotheses in order to carry their burden of establishing that their experts' opinions were relevant and reliable under *Daubert*. As they were required to do, when considering the general causation question with respect to exposure to friction products and asbestos-related diseases, plaintiffs' experts reviewed all of the available evidence, including their own published research, other peer-reviewed supporting studies, and the studies proffered by the defendant's expert in support of the defense hypotheses, and concluded from this evidence that there was no legitimate basis to discount the data demonstrating a conclusive positive association between exposure to chrysotile and asbestos-related diseases.[67] This reflected sound methodology and adherence to the *Daubert* criteria.

Perhaps if plaintiffs' burden of proof in the face of a *Daubert* challenge was to prove the reliability of their experts' opinions beyond all reasonable doubt, or even by clear and conclusive evidence, it might then be necessary for the experts to disprove an unproven hypothesis that has been offered to counter their own opinions. This, of course, is not the state of the law. By erroneously suggesting that Dr. Dodson and/or

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[67] *See In Re Bextra Product Liab. Litig.,* 524 F.Supp. 2d 1166, 1176 (N.D. Cal. 2007)(noting that sound methodology requires the expert to consider both supporting and contrary data). *See also, Federal Reference Manual on Scientific Evidence,* at 68-75 (2d. Ed. 2000)(discussing generally the scientific method); *Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579, 593 (1993)(same).

Dr. Lemen had or, at least, had attempted to disprove the defendants' friction product hypotheses, the Court gave the impression that they were obliged to do so in order for plaintiffs to satisfy their *Daubert* burden. To the extent this impression was given, it did not correctly reflect the prevailing law.[68]

IV.

Based on the foregoing, the Court is satisfied that it properly discharged its *Daubert* gate keeping responsibilities when it denied the Defendants' Motion *In Limine* To Exclude Expert Testimony That Automotive Friction Products Cause Asbestosis, Lung Cancer and Mesothelioma. The plaintiffs' experts' methodologies were both intrinsically reliable and reliably applied to the facts as elicited during the *Daubert* hearing.

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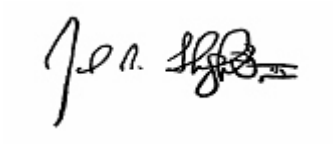
[68] *See Amrosini v. Labarraque*, 101 F.3d 129, 140 (D.C. Cir. 1996)(the fact that an expert has not eliminated all possible hypothesis or "causes" "only goes to the accuracy of the conclusion, not the soundness of the methodology."); *Heller v. Shaw Indus., Inc.,* 167 F.3d 146, 156 (3d Cir. 1999)(holding that "an expert's causation conclusion should not be excluded because he or she has failed to rule out every possible alternative cause."); *Porter v. Whitehall Labs, Inc.*, 9 F.3d 607, 614 (7th Cir. 1993)(holding that *Daubert* requires exclusion of "unproved hypotheses."); *In Re Paoli R.R. Yard PCB Litig.,* 35 F.3d 717, 764 (3d Cir. 1994)(same).

WHEREFORE, the Prothonotary is directed to deliver this Report on Remand and the record of this case to the Clerk of the Supreme Court of Delaware forthwith.

IT IS SO ORDERED.



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