Science on Law's Terms:
Implications of Procedural Legitimacy on Scientific Evidence

by

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The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled "Science on Law's Terms: Implications of Procedural Legitimacy on Scientific Evidence" by Nayha Jayant Acharya in partial fulfilment of the requirements for the degree of Master of Laws.

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For Kaka, of course.

And for Kaki and Ba, who make me feel special, for nothing.

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Abstract

Scientific evidence is relied on more and more in litigation. Discussions and debates aimed at enabling courts to make the best use scientific evidence are increasingly critical. This thesis adds the perspective of procedural legitimacy to the science and law discussion. Procedural Legitimacy is the concept that consistent adherence to legal procedure maintains the overall legitimacy of the legal system, and the validity of its outcomes. I argue that the integrity of legal procedures must be maintained where scientific evidence is presented, so that judicial decisions that rely on scientific evidence are legitimate.

The bulk of this thesis develops the notion of procedural legitimacy, and argues that its role in the adjudicative process is vital. The argument is founded on the conditions of uncertainty in which legal decisions are made. The uncertainty is self-evident in the process of legal fact-finding. Legal facts do not have to be proven on a standard of certainty, meaning that legal facts are not *certainly* true. Still, the substantive law is applied to those legal facts, resulting in the risk that legal outcomes are factually or substantively inaccurate. Despite this risk of inaccuracy, consistent application of the legal procedure for finding legal facts, and a proper application of legal principles, ensures that adjudicative decisions are legitimate. I illustrate the procedural legitimacy framework by applying it to personal injury actions, where scientific evidence is often required. I show that both liability determinations and damages determinations in personal injury actions are made in conditions of uncertainty, and are dependent on consistency in procedure to maintain legitimacy.

I argue that in order to maintain legitimate legal outcomes, procedural rules must be applied consistently and vigilantly to scientific evidence. This means that admissibility rules must be applied properly to scientific evidence, and that admitted scientific evidence must be duly scrutinized and weighed against the legal standard of proof. This ensures that the legal outcome will be based on valid legal facts. When the law is then applied to those legal facts, litigants are legitimately bound by the judicial decision, despite the risk of factual inaccuracy.

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First and foremost, I am enormously indebted to Professor Ronalda Murphy, who is the best possible LLM supervisor. She appreciated my intuitions well before I did, and gave me the confidence to pursue them; she guided my thinking and led me through my confusions; she was endlessly encouraging and supportive. And her influence never had the flavor of imposition – she allowed me to feel that my thoughts were valuable and were driving this work, even though I could hardly articulate them myself. Looking back, it is clear to me that I owe my thesis (except its shortcomings) to Prof. Murphy. I would not have recognized, appreciated nor expressed the argument without her. Far from being a year of my own production, Prof. Murphy has enabled a humbling period of learning for me. If it has been successful, then it is because she is the ideal teacher: rigorous though compassionate, reassuring but frank, and bizarrely smart (if I may say) yet accessible. I chanced on the privilege of being her student; my ambition is to live up to it.

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Along with my supervisors, I have benefited greatly from many discussions with David Dzidzornu. During the numerous times when I thought that my project was sinking, David singlehandedly brought it back afloat, reassuring me that my muddled thoughts had some merit hidden within them. Throughout the year, David has allowed me to speak to him about my project at extreme length. He has encouraged me tremendously. Though unofficially, he has indeed supervised my project, and I would not have completed it without his help and support.

Besides my teachers, I have had much support from family and friends during this year. My family in Edmonton, including my Mom and Dad, Hernish (Gurgle) and Shipra (Bhabhs), Kumud Dada and Kirti Bhabhu, Kaka and Kaki and Ba, has remained close to me despite my being a little far. Because they all value education, I was able to feel that I was doing the right thing by pursuing more of it, which has been a great source of encouragement for me.

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Chapter 1. Introduction*

Chapter Overview

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Part 1. The Importance of the Science/Law Dialogue and my Approach

As Learned Hand commented in 1901, "No one will deny that the law should in some way effectively use expert knowledge whenever it will aid in settling disputes...the only question is how it can do so best."[1] The presentation of science in courts has occurred through expert witnesses since the 18th century, and questions seeking the

*Sections of this chapter are based on a number of previous works completed for credit during the course of my LLM, including: 'Methodological Prospectus - Science, Law and Legitimacy: Procedural Legitimacy Applied to the Science and Law Interaction', submitted for the Graduate Seminar, 2011-2012; 'The Arduous Task of Judges when Science Meets Law: Perspectives from Mental Injury Evidence', submitted for Mental Disability Law, Fall Term, 2011-2012; 'Law's Treatment of Science: From Idealization to Understanding', an earlier version of which was submitted for Science and Law, Fall Term 2011-2012.

[1] Learned Hand, "Historical and Practical Considerations Regarding Expert Testimony" (1901) 15 Harv L Rev 40.

best way to accept and use such evidence have been asked ever since.[2] Fast-paced advances in scientific knowledge, and increasing utilization of science in litigation have made this question particularly relevant in the context of scientific expert evidence. In an extra-judicial commentary describing the difficulties with science in the courtroom, Binnie J indicated that "[s]cience disputes are hitting the courts at an increasing velocity. In cases involving tort, environmental, intellectual property and criminal law, the admission and use of expert scientific or technical testimony is often crucial to the outcome."[3] As more and more disputes that have scientific bases confront the courts, the most appropriate presentation and use of scientific evidence will become a correspondingly critical issue.

The urgency of enhancing the understanding between science and law is particularly blatant when considering the role that scientific evidence played in the miscarriages of substantive justice wherein factually innocent accused persons were convicted of crimes they did not commit.[4] For instance, the Kaufman Inquiry, which

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[2] For a discussion of the early rules and criticisms surrounding expert testimony, see Glen Anderson, *Expert Evidence,* 2d ed (Markham, Ontario: Lexis Nexis Canada Inc. 2009).

[3] Justice Ian Binnie, "Science in the Courtroom: The Mouse that Roared"(2007) 56 UNB LJ 307 at 1 [Binnie, Science in the Courtroom].

[4] Appreciating this urgency, Hon. Justice Thomas A. Cromwell commented in "The Challenges of Scientific Evidence" (McFayden Lecture, Memorial Series, sponsored by the Scottish Council of Law Reporting, delivered at the Royal Society of Edinburgh, March 2, 2011) at 1 as follows: "In virtually every jurisdiction, these courtroom encounters between law and science have also resulted in spectacular miscarriages of justice. This, along with the other concerns, have resulted in action by courts, legislatures and law reform bodies in many jurisdictions. It is timely, therefore, to review the law concerning expert and scientific evidence and the various reforms that have been put in place to address these challenges." Available

investigated the wrongful conviction of Guy Paul Morin revealed the hair comparison and fiber comparison evidence relied upon to convict had little probative value if properly understood.[5] More recently, the Goudge Inquiry, commissioned to "conduct a systemic review and assessment of the way in which pediatric forensic pathology was practiced and overseen in Ontario, and particularly how it relates to the criminal justice system"[6] revealed the problematic reliance on the expert testimony of Dr. Charles Smith. Dr. Smith was respected pediatrician at Toronto's Hospital for Sick Children who frequently provided medical testimony in cases involving accused convicted of murdering children who had died in their care.[7] As a result of the Goudge Inquiry, a number of these cases were reopened, leading to acquittals or new trials.[8]

These inquiries expose the gravity of unreliable scientific testimony. At the same time, these, and other projects dedicated to exonerating wrongfully convicted persons, reveal the utility of scientific knowledge. For example, advances in DNA forensic sciences have significantly contributed to the exoneration of factually

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online: <http://www.scottishlawreports.org.uk/publications/macfadyen-2011.html>[Cromwell Lecture].

[5] Canada, *Kaufman Commission on Proceedings Involving Guy Paul Morin, Report, Recommendations* (Toronto, Ontario Ministry of the Attorney General,1998) (Chair: Fred Kauffman), Executive Summary at 5-6 [Kaufman Commission], online: <http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/morin/>.

[6] Ontario, Report of the Inquiry into Pediatric Forensic Pathology in Ontario (Toronto: Queen's Printer, 2008) (Chair: Stephen T Goudge), Executive Summary at 5-6 and 8, online: <goudgeinquiry.ca> [Goudge Inquiry]

[7] See Goudge Inquriy, *ibid*, Ch. 18.

[8] *Ibid*, Executive Summary at 48-49.

innocent convicted persons.[9] Courts recognize this duality. They appreciate scientific evidence can be useful and necessary to assist triers of fact in making adjudicative decisions. On the other hand, they acknowledge complex scientific information presented by a distinguished expert could generate deference to the expert's opinion; decisions lacking critical scrutiny by fact-finders is a particular concern with scientific evidence.[10] Given two-sidedness of scientific evidence, the task is to make the courts more 'science-friendly'[11] so that the probative value and prejudicial impact of scientific evidence can be balanced, allowing the court access to probative scientific evidence to be used, and preventing, to the extent possible, the potential prejudice.

"The task of making courts more science friendly," Binnie J suggests, "is important to sustaining the legitimacy of courts as dispute resolution institutions."[12] Certainly, the validity of adjudicative decision-making based on a faulty understanding of science or an erroneous deference to science and scientific expertise is questionable in criminal, civil and administrative litigation. This has prompted courts and scholars to debate how best to achieve an amicable relationship between science and law. With the stirring examples of substantive

[9] For a more detailed discussion of forensic sciences and their utility, especially in Innocence Projects, that aim to exonerate wrongfully convicted persons, see Gary Edmond and Kent Roach, "A Contextual Approach to the Admissibility of the State's Forensic Science and Medical Evidence" (2011) 61 UTLJ 343 at 358-367 [Edmond and Roach].
[10] This sentiment was expressed in *R v Mohan* [1994] 2 SCR 9, SCJ No 36 (QL) [*Mohan*] the leading Canadian case setting out the admissibility of expert testimony, and will be explored further later in this chapter.
[11] This phrase is borrowed from Binnie, Science in the Courtroom, *supra* note 3 at 1.
[12] Binnie, Science in the Courtroom, *supra* note 3 at 1.

inaccuracies in the criminal context in the background, the science and law discussion is unsurprisingly framed in terms of achieving substantive accuracy, or factually accurate decisions. In other words, the focus has been to ensure that the courts 'get the science right,' so that substantively or factually inaccurate outcomes made on the basis of either improper or improperly understood science can be avoided.

Without a doubt, these substantive concerns are important – avoiding factually inaccurate outcomes is obviously desirable in both civil and criminal adjudication. I argue, though, that despite the understandable preference for factually accurate outcomes, the effort to achieve substantive accuracy should not overshadow the importance of procedural accuracy in maintaining legitimate adjudicative outcomes. My intended contribution, therefore, is to supplement the science and law discussion with an invitation to ensure that the significance of procedural propriety is not under-emphasized in the quest to achieve more 'science-friendly' courts.

In the upcoming chapters, I demonstrate the necessity of consistent adherence to legal procedure as a pre-requisite to maintaining legitimate adjudicative outcomes. In Chapter 2, I show how the procedural legitimacy argument is derived, and its inherent applicability in the legal process. In the second part of Chapter 2, I discuss personal injury cases decided by the Supreme Court of Canada and the House of Lords, where scientific evidence is relevant to establishing the causal connection between the act of negligence and the injury suffered. In their analyses, the courts

have displayed a commitment to procedural legitimacy, which is consistent with my thesis. In Chapter 3, I demonstrate the applicability of procedural legitimacy when courts are called on to determine personal injury damages awards. As I will explain further in Chapter 3, this application enables me to drive home the significance of procedural legitimacy, and to show that procedural legitimacy is consistently applicable throughout the civil litigation process.

Although procedural legitimacy is pertinent throughout legal decision-making, including criminal cases, I focus on civil liability for personal injuries. Because personal injury litigation is often contingent on scientific evidence, this focus allows me to remain close to my ultimate application: using the procedural legitimacy framework to offer an approach to the question of how the legal process can best accommodate science. Approaching the science and law interaction from the perspective of procedural legitimacy, I suggest, can permit the adjudicative process to account for the probative and prejudicial value of scientific evidence, while avoiding the self-compromise that would result from improper alterations to, or misapplications of, legal procedure in an effort to accommodate science.

In order to situate my application of procedural legitimacy, I will provide an account of the concerns that have tended to be at the forefront of the science and law discussion. In that effort, below, I track the evolution of the admissibility criteria for scientific expert evidence, and the accompanying gatekeeping role assigned to judges, as this development was driven by the various concerns that scientific

evidence brings with it. Within this discussion, I will point out scholarly critiques of the judicial approach to scientific evidence, academic interpretations of the science and law challenge, and the prominent approaches to overcoming some of the barriers that have been thought to prevent an appropriate science and law interaction.

This groundwork provides a brief, though illustrative discussion of the concerns surrounding science and law, and a flavor for how these concerns tend to be approached. As I explain below, the science and law discussion displays an emphasis on substantive concerns, coupled with an under-emphasis on procedural legitimacy. This chapter concludes with an introduction to my alternative approach by briefly describing the basis for my view that an under-emphasis on procedural legitimacy must be avoided. In the subsequent chapters, I will develop the concept of procedural legitimacy further, which will lead to my endorsement of those solutions to the science and law concerns that are consistent with procedural legitimacy.

Part 2. Jurisprudential Landmarks in Science and Law

Because Canada has borrowed from the American approach to admissibility of scientific evidence, and because the American experience provides useful insights into the different concerns surrounding scientific expert evidence, I will begin with a brief discussion of the American judiciary's approach to admissibility, followed by an account of the Supreme Court of Canada's holdings. My intention in this section is both to provide an overview of science and law jurisprudence, and to use the

description of the evolving admissibility criteria as an indication of what concerns underlie the science and law interaction. Therefore, along with outlining the jurisprudential development, I will make note of scholarly concerns that have accompanied the evolving admissibility constructs.

2(a). American Development

In the United States, three milestones sum up the development of admissibility criteria for scientific evidence: the *Frye* general acceptance test[13], Federal Rule of Evidence, Rule 702[14], and the landmark *Daubert* case[15] along with two other cases that are sometimes referred to as the '*Daubert* Trilogy'.[16] In 1923, what is known as the "general acceptance" test was set out in the *Frye* decision. "While courts will go a long way in admitting expert testimony deduced from well-recognized scientific principles," the court commented, "the thing from which the deduction is made must be sufficiently established to have gained the general acceptance in the particular field in which it belongs."[17] More than half a century later, the Federal Rules of Evidence ("FRE") came into force, representing the next milestone in admissibility

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[13] *Frye v United States* 293 F 1013 (DC Cir. 1923) [*Frye*]
[14] Fed R Ev702 (1975) [FRE].
[15] *Daubert v Merrell Dow Pharmaceuticals, Inc*. 509 US 579 (1993) [*Daubert*].
[16] *Kumho Tire Co v Carmichael* 526 US 127 (1999) [*Kumho*], *General Electric Co v Joiner* 522 US 136 (1999) along with *Daubert* are usually referred to as the "*Daubert* Trilogy." *Joiner* and *Kumho* are both endorsements of the *Daubert* approach. In *Joiner*, the Supreme Court effectively insulated the trial judge's admissibility determination, based on the *Daubert* criteria, from appellate review, demonstrating strong support for the *Daubert* analysis. In *Kumho*, the Supreme Court held that the *Daubert* approach was applicable, though flexibly, to evidence that does not necessarily fit squarely under the label "science." There, the *Daubert* approach was applied to engineering evidence related to faulty tires.
[17] *Frye*, *supra* note 13 at 1014.

criteria in the United States. Although the FRE are only binding on Federal Courts, they have been relevant to state judicial decisions as well. FRE 702 reads:

> 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.

As Bernstein has suggested, the "only clear effect of this rule was to liberalize the type of person who could appear as an expert."[18] Certainly, a plain reading of FRE 702 would suggest that the qualification of the witness is the primary concern – if the witness is appropriately qualified, the evidence can be tendered. Also within the rule, however, is the recognition that the evidence must be of assistance to the trier of fact. This rule parallels the requirement of qualification of witnesses and for the scientific opinion to be necessity to the trier of fact in the Canadian admissibility rules, discussed further below.

After the coming into force of the FRE, the *Frye* general acceptance test met with some judicial scrutiny. Through that scrutiny, a new approach that emphasized reliability of evidence began to emerge, supplementing the previous approach, which seemed to stress the qualifications of the witness.[19] In 1993, the Supreme

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[18] David E. Bernstein, "Junk Science in the United States and the Commonwealth" (1996) 21 Yale J. Int'l L. 123 at 128 [Bernstein].

[19] A 1978 case, *United States v Williams* 583 F.2d 1194 (2d Cir. 1978) demonstrated the emergence of reliability as a relevant consideration in admissibility prior to the landmark decision of *Daubert*. The Court of Appeal held in *Williams* that weighing probative value (i.e. materiality and reliability) against the prejudicial value of the evidence including the likelihood of misleading a jury should be the relevant consideration for admissibility of any evidence, including scientific evidence. So while reliability was not the absolute concern for admissibility for the Court in *Williams*, it had by then made its way into the analysis.

Court had an opportunity to pronounce on the issue of whether the *Frye* general acceptance test withstood the FRE, and the extent to which reliability of evidence would impact admissibility.

The opportunity came in a case called *Daubert v Merrell Dow Pharmaceuticals.*[20] Justice Blackmun, writing for the majority of the Supreme Court, crafted a new test for the admissibility of scientific evidence. His decision in *Daubert* announced that the FRE called for something beyond the general acceptance test for admissibility in *Frye*. Justice Blackmun set out an approach wherein unreliable scientific evidence should be ruled inadmissible by judges acting as gate-keepers. Since FRE 702 used the word 'scientific,' Justice Blackmun reasoned, the rules implied that only evidence that adhered to scientific procedures should be admissible evidence.[21]

As such, Justice Blackmun called for the use of scientific criteria to be applied by the trial judge at the admissibility stage to determine whether scientific evidence had adhered to scientific procedures. If so, it would be scientifically reliable and admissible. According to the *Daubert* approach, in order to determine the admissibility of scientific theories or techniques, a judge would have to ask him or herself:

1. Has the technique or theory been tested – i.e. subjected to the scientific concept of falsification?
2. Has the theory or technique been published or peer reviewed?
3. Does the scientific technique have a known or potential rate of error?

[20] *Daubert*, *supra* note 15.
[21] *Daubert*, *supra* note 15 at 590.

4. Is the theory or technique generally accepted in the relevant scientific community?[22]

The drastic change in admissibility criteria that occurred between *Frye* and *Daubert,* with rule 702 in between, demonstrates the dual sided nature of the science and law discussion. The *Frye* general acceptance test contained the concern that scientific theories that are not generally accepted in the field are too prejudicial to admit. However, along with being criticized for its vagueness in failing to define the terms 'general acceptance,' or the 'particular field,'[23] *Frye* was additionally criticized for unduly preventing the admissibility of novel techniques that may be useful and relevant to the fact-finding process, but not yet generally accepted in the relevant field.[24] Rule 702 significantly broadened the admissibility criteria – where the scientific evidence could assist the trier of fact and was presented by a qualified witness, it was admissible.[25] This could be interpreted as an appreciation of the utility of novel science in the courtroom (or in other words, appreciating that it would be useful for the law to be as up to date with science as possible), representing the "probative value" side of the science and law discussion.

The *Daubert* interpretation of Rule 702 imported scientific constructs of legitimacy into the courtroom as an intended safeguard against illegitimate 'science'. The *Daubert* approach can be interpreted as valuing the utility of novel science by making "general acceptance" just one part of the test for admissibility rather than

[22] *Daubert, supra* note 15 at 592-594.
[23] Bernstein, *supra* note 18 at 129.
[24] *Ibid* at 128.
[25] FRE, s*upra* note 14.

the admissibility test itself. It further demonstrated an appreciation of the prejudicial impact that faulty science may have by requiring that judges act as gate keepers and apply scientific constructs to determine whether the evidence being tendered is scientifically reliable.[26]

The American milestones thus indicate that scientific evidence can be necessary and relevant to the adjudicative process. Along with relevance and necessity, the qualification of the witness to present such evidence has consistently remained a primary consideration in determining admissibility. The reliability of scientific evidence subsequently gained importance as an imperative question to determine admissibility. This was particularly emphasized in the *Daubert* decision, where judges were called on to determine the scientific reliability of evidence prior to admitting it. These sentiments are echoed in the distinct, though similar, Supreme Court of Canada admissibility jurisprudence, which has borrowed from the American experience, as outlined below.

2(b). Canadian Approach

When it comes to admissibility of evidence in Canada, the leading case is *R v Mohan*[27]. There, Sopinka J. set out the current test for admissibility of expert evidence in Canada. Under the *Mohan* analysis, experts are permitted to state opinions as an exception to the rule disallowing admissibility of opinion evidence. To fall within the exception, the expert's testimony must fulfill four criteria. First,

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[26] Justice Blackmun's incorporation of what he thought to be appropriate scientific constructs into legal reasoning has been questioned, and I will briefly return to this criticism later in this chapter.

[27] *Mohan*, *supra* note 10.

the subject of the expert's opinion must be relevant. Relevance includes logical relevance, meaning the evidence must tend to prove a fact at issue. Relevance additionally includes legal relevance – the probative value of the expert's opinion must outweigh any prejudicial impact it may have. Second, along with relevance, the expert's testimony must be necessary to the trier of fact (i.e. outside of the scope of a layman's knowledge). Third, the expert must be qualified to offer the opinions given. Fourth, if no other rule is applicable to exclude the expert's evidence, then the opinion is admissible.[28]

Along with setting out the test for admissibility of scientific evidence generally, Sopinka J cautions of the danger of misuse of expert evidence in *Mohan*: "Dressed up in scientific language which the jury does not easily understand and submitted through a witness of impressive antecedents,"[29] it could distort the fact-finding process as juries would naturally give excessive weight to such evidence. In other words, triers of fact are susceptible to displaying deference to scientific (or scientific-looking) evidence, and thereby failing to critically evaluate it, resulting in fact-finding distortion. Anticipating this distortion to the fact-finding process, Sopinka J. further comments that novel scientific techniques should be subjected to "special scrutiny to determine whether it meets a basic threshold of reliability."[30] Although there is no mention of reliability in Justice Sopinka's articulation of the test for admissibility of expert evidence, his cautionary comments in respect of novel

[28] *Mohan, supra* note 10 at paras 17-28.
[29] *Ibid* at 19.
[30] *Ibid* at 28.

scientific evidence suggested that the Canadian approach was paralleling the American shift from the *Frye* general acceptance test to the *Daubert* paradigm of internal reliability, confirmed by subsequent Supreme Court of Canada decisions.

While Sopinka J had left *Daubert* unmentioned in *Mohan*, the Supreme Court in *R v J. L.J*[31] interpreted Justice Sopinka's test for admissibility of expert evidence in *Mohan* as a move paralleling the *Daubert* rejection of the *Frye* 'general acceptance' test, in favour of a 'reliable foundation' test.[32] Concerned that the 'search for truth' should not be distorted by unreliable evidence, Binnie J, writing for the Court in *J. L.J,* explained that "admissibility of expert evidence should be scrutinized at the time it is proffered, and not allowed too easy an entry on the basis that all of the frailties could go at the end of the day to weight rather than admissibility."[33] The Court in *J. L.J.* drew guidance from the *Daubert* decision for appropriate criteria for determining the reliability of scientific evidence.

While the Court in *J. L.J.* was careful to indicate that its intention was not to change the *Mohan* analysis, the two approaches were amalgamated in a 2007 decision of the Alberta Court of Queen's Bench in *R v Wood*.[34] This amalgamation was not intended to represent a strict test to be invariably applied, but a synopsis of the considerations that could be relevant to admissibility of expert evidence, representing the *Mohan* analysis, supplemented by *J. LJ:*

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[31] *R v J. L.J* [2000] 2 SCR 600, SCJ No 52 (QL) at paras 28, 33 [*J L.J.*].
[32] *Ibid*.
[33] *Ibid* at 28-29.
[34] *R v Wood* [2007] 11 WWR 330, AJ no 895 (QL) at para 50.

Criterion I. Relevance to an issue
- A. Does the evidence meet the threshold of logical relevance?
- B. Does the evidence meet the threshold of reliability?
  - a. Is the opinion based on novel science?
  - b. Does the opinion evidence pertain to the ultimate issue?
  - c. Does the novel science attain threshold reliability? [Daubert factors]
    - i. Has the theory/technique been tested?
    - ii. Has the theory or technique been subject to peer review/published?
    - iii. Is there a known or potential error rate?
    - iv. Is the theory/technique generally accepted?
- C. Do the costs of admitting the evidence out-weigh the benefits?

Criterion II. Necessary to assist the trier of fact.
- A. Is the subject matter of the expert opinion beyond that of the trier of fact?

Criterion III. Absence of any exclusionary rule
Criterion IV. Properly qualified expert.

Mohan and the subsequent cases could be taken to mean that the reliability analysis need only be undertaken for novel scientific evidence. In Edmond and Roach's interpretation, for instance, "*Mohan's* focus on novel science… neglected the iterative nature of scientific practice, the role of courts in processes of social legitimation, and the possibility of emerging controversy – even within established sciences."[35] Similarly, Edmond and Roach further comment that in the *J. L.J* case, "the Court reiterated the need to subject any *novel* scientific technique 'to *special scrutiny* to determine whether it meets *a basic threshold of reliability*".[36] But the novelty component in Sopinka J's comments in *Mohan* have been given less emphasis in other interpretations, including Goudge J,'s explanation of *Mohan* in this respect:

> In my view, [Mohan] should not be interpreted to suggest that the judge's gatekeeper role in ensuring the threshold reliability of expert evidence is

[35] Edmond and Roach, *supra* note 9 at 381.

[36] *Ibid* at 382 [emphasis in the original].

> limited to "novel scientific theory or technique." The reference to novel science is best seen as a particular example where the reliability of the purported science from which the expert opinion is drawn will need to be evaluated. This example is not, however, the only circumstance where judges should be concerned about the reliability of proposed scientific evidence. In recent years, the jurisprudence has been moving in the direction of recognizing the importance of reliability standards for all expert evidence and, indeed, for all evidence.[37]

Even if *Mohan* and *J L.J*. are taken to mean that the reliability analysis need only be undertaken for novel scientific evidence, the more recent *R v Trochym*[38] decision contains a clear expansion of that principle: the reliability analysis should be undertaken for scientific evidence, whether or not it is novel. In *Trochym,* the Supreme Court commented on the fluidity and fallibility of science. Translating into a comment on admissibility, a technique or theory that may have once been admissible may later be inadmissible, as scientific inquiry progresses. In *Trochym* the majority upheld the a ruling that rejected admissibility of post-hypnotic evidence[39] despite the concerns expressed by the dissenting judges that hypnosis evidence was in fact well established, it had already been scrutinized by the courts, and had been admitted in many cases previously.[40]

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[37] Goudge Inquiry, *supra* note 6.
[38] *R v Trochym* [2007] 1 SCR 239, SCJ no 6 (QL) [*Trochym*].
[39] Post-hypnotic evidence refers to witness statements that are obtained after the witness' memory has been (supposedly) refreshed through hypnosis. In *Trochym*, *ibid*, a key witness told police that she saw the accused come out of the victim's residence on a Thursday. After being hypnotized, she told them that she had in fact witnessed the accused emerge from the victim's residence on Wednesday. The post-hypnotic evidence was more consistent with the Crown's theory of how the accused had murdered the victim.
[40] In *R v Clarke* [1984] 13 CCC (3d), 117 AJ no 19 (QL) (ABQB), for example, post-hypnotic evidence was admitted.

Trochym's contribution, therefore, is a confirmation that reliability of evidence should be assessed, whether or not evidence is grounded on a novel technique of theory.[41] It further suggests admissibility of evidence cannot be undertaken using the familiar legal principle of precedent – what was once admitted by the courts may later not be. What is relevant for admissibility is reliability. Implicit in the trumping of the principle of reliability over the principle of precedent is the significance that is placed on reliability analyses in order to ensure that scientific evidence is as free from prejudicial impact as possible when it makes its way into the adjudicative process – reliability is an important analysis that trumps the legal system's usual preference for precedent.

The Canadian experience suggests that the apprehensions arising from the science and law interaction in Canada are similar to those that influenced the American development – there is a desire to appropriately use science, novel or otherwise, in the litigation process, but there is a fear of its potential prejudice to the fact-finding process as well, because fact-finders are thought to be susceptible to defer to an expert without critical examination of the experts' qualifications or the evidence presented. These concerns were reiterated in the Goudge Inquiry, which pointed to two categories of shortcomings that were consistently displayed by trial judges at

[41] For a strong endorsement of the Court's approach in *Trochym*, *supra* note 38, particularly in respect of the importance placed on the reliability of evidence and the impacts of unreliable evidence in the criminal law context, see Edmond and Roach, *supra* note 9 at 383-387.

the admissibility stage: inadequate scrutiny of the expert's qualifications and inadequate assessment of the threshold reliability of evidence prior to admittance.[42]

To account for the feared prejudice of reliance on unreliable scientific evidence, concepts of reliability made their way into the *Mohan* analysis. Trial judges have been called on to apply scientific constructs to determine scientific reliability of evidence prior to admitting it. Tasking trial judges with the responsibility of being the primary safeguard against unreliable science has been subject to critique on two major grounds. First, the capacity of trial judges to assess scientific reliability is questionable. And second, the *Daubert* constructs of scientific reliability (which have been endorsed in Canadian jurisprudence) have been criticized for reflecting an erroneous understanding of 'science' and its procedures. A short discussion of both concerns follows.

Part 3: Scholarly Concerns and Critiques

3(a). The Capacity Issue

A judge's capacity to play the gate-keeping role by applying scientific criteria to determine admissibility of evidence was doubted in the dissenting opinion of Rehnquist J in *Daubert,* where he presented his mistrust that judges, with limited scientific background, could meaningfully engage in the task handed to them:

> I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its 'falsifiability,' and I suspect some of them will be, too. I do not doubt that Rule 702 confides to the judge some gatekeeping responsibility in deciding questions of the admissibility of proffered expert testimony. But I do not think

[42] See Goudge Inquiry, *supra* note 6, Chapter 18. I engage in a more thorough exploration of the Goudge Inquiry and its recommendations in my concluding chapter.

> it imposes on them either the obligation or the authority to become amateur scientists in order to perform that role.[43]

Empirical studies conducted in the United States lend support to Rehnquist J's caution. Kapardis and Edmond & Roach point to studies that suggest that although judges tend to scrutinize evidence more and use more pre-trial *Daubert* admissibility hearings, they seem to exclude evidence generally for the same reasons that they did before, not engaging too deeply in application of scientific principles.[44] Moreover, Kapardis refers to a study that surveyed judges and found that key components of the *Daubert* test, "falsifiability" and "error rate" were not understood by most judges.[45] Though a comprehensive empirical study of judicial capacity has not been conducted in Canada, it is safe to presume that Canadian judges would fair similarly considering that they share a similar educational background. If, as these empirical studies suggest, judges are not able to understand the scientific constructs that they are supposed to apply, then their ability to play the gate-keeping role they are tasked with is doubtful. If that is the case, then the protective goal of gate-keeping is compromised.

The adversarial presentation of scientific evidence may augment the problem of scientific illiteracy among judges, because they are bombarded with two-sided

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[43] *Daubert*, *supra* note 15 at 600 (Rehnquist, CJ, dissenting).
[44] Carol Krafka et al, "Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials" (2002) Psychol, Pub Pol'y & L 309, cited in Edmond and Roach, *supra* note 9 and in Andreas Kapardis, *Psychology and Law A Critical Introduction,* 3d ed (Cambridge: Cambridge University Press 2010) at 238 [Kapardis].
[45] Kapardis, *ibid* at 239.

technical information at trial and may lack any background in the material being presented. Judges are expected to gain an understanding of the material that lawyers likely have had a few years to grapple with in preparing their case, and experts are naturally well-versed in, in a very short time period, and through the evidence of witnesses pitted against one another. Consequently, the judge resorts to the more familiar techniques of assessing evidence – through the witness's demeanor rather than a more direct scrutiny of the evidence presented.[46] Binnie J illustrated this quandary pointing to the telling comments of Justice Frank Muldoon of the Federal Court, Trial Division:

> A judge unschooled in the arcane subject is at difficulty to know which of the disparate, solemnly-mouthed and hotly contended scientific verities is, or are, plausible. Is the eminent scientist expert with the shifty eyes and poor demeanour the one whose "scientific verities" are not credible? Cross-

[46] I am not suggesting that assessing the demeanor of a witness is improper. Certainly, the credibility of a witness, whether expert or a factual witness, is a relevant to determining how much weight to give to his or her testimony, and the witness's demeanor is relevant to assessing credibility. For instance, see *R v Unilever PLC v Procter & Gamble Inc* [1997] 3 SCR 320, SCJ No 77 (QL) at 29: "there may be something about a person's demeanor in the witness box which will lead a juror to conclude that the witness is not credible. It may be that the juror is unable to point to the precise aspect of the witness's demeanor which was found to be suspicious, and as a result cannot articulate either to himself or others exactly why the witness should not be believed. A juror should not be made to feel that the overall, perhaps intangible, effect of a witness's demeanor cannot be taken into consideration in the assessment of credibility." However, using a witness' demeanor as the only method of assessing scientific evidence would leave the evidence itself un-scrutinized. For more on assessing credibility of witnesses, particularly through reliance on common sense judgment of demeanor, see Steven Friedland "On Common Sense and the Evaluation of Witness Credibility" (1990) 40 Case W Res L Rev 165; Sarah Barmak, "The fallacy of lying eyes and guileless smiles; A new study shows judges and others form biases based on the faces of people in court", *The Toronto Star* (August 15, 2010) (QL) for an accessible commentary; and for an empirical study assessing the relationship between juror's personalities and expert witness demeanor, see Robert Cramer, Stanely Brodsky & Jamie DeCoster, "Expert Witness Confidence and Juror Personality: Their Impact on Credibility and Persuasion in the Courtroom" (2009) 37.1 J Am Acad Psychiatry Law 63.

> examination is said to be the great engine for getting at the truth, but when the unschooled judge cannot perceive the truth, if he or she ever hears it, among all the chemicals and other scientific baffle-gab, is it not a solemn exercise in silliness?"[47]

To account for the concern that judges are put in a difficult position attempting to assess evidence in subjects that they have little to no background in, the most direct solution that has been offered is to improve judges' scientific literacy through educational efforts to put them in a better position to scrutinize evidence.[48] But the issue is not limited to judicial scientific illiteracy alone. As the above quotation suggest, rather than assisting the Court, dueling experts are seen to exacerbate the comprehension difficulties, implying that the role of the expert as an objective, helpful guide to the court is not materializing. The Goudge Inquiry addressed this point when it was revealed that Dr. Charles Smith understood his role to be that of an adversary advocating for one party, as opposed to a neutral assistant to the court, highlighting the concern about the impartiality of experts.[49,50]

Where the science and law interaction is approached with an emphasis on expert impartiality, authors suggest that adversarial presentation of science prevents the neutrality and can distort the objectivity that is intended to characterize science. This analysis prompts solutions that alter the adversarial process in respect of

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[47] *Unilever PLC v Procter & Gamble Inc.* (1993), 47 CPR (3d) 479 at 488 cited in Binnie, Science in the Courtroom, *supra* note 3 at 3.
[48] Cromwell Lecture, *supra* note 4 at 59, Binnie Science in the Courtroom, *supra* note 3 at 11, Goudge Inquiry, *supra* note 6, Recommendations 134-135 at 502.
[49] Goudge Inquiry, *supra* note 6 at 503.
[50] For a thorough discussion of policy concerns related to expert impartiality, see Paul Michell and Renu Mandhane, "The Uncertain Duty of the Expert Witness" (2005) 42 Alta. L. Rev. 635 [Michell and Mandhane].

scientific expert evidence in order to reduce the impact of adversarialism on scientific experts. These include the appointment of *amicus curiae* that might assist judges in science-heavy cases, or increasing the use of court appointed or joint experts.[51] Perhaps somewhat less drastically, it has been recommended that experts be advised that their role is not to act as adversaries but as impartial assistants to the court.[52]

The concerns related to judicial scientific literacy are therefore two fold. First, if judges do not have the educational background necessary to comprehend scientific material and scientific constructs, then their ability to protect the trial process from prejudicial scientific evidence is limited. Second, the problem is thought to be augmented by the adversarial presentation of scientific evidence, which makes it all the more difficult to understand and evaluate the evidence presented. These practical concerns present a useful reminder that the science and law interaction must be approached by keeping in mind that asking judges to play a primary role in protecting the trial process from prejudicial science must be coupled with determining whether they can play that role meaningfully, what can be done to

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[51] See for example, Cromwell Lecture, *supra* note 4 at 50-55; Binnie, Science in the Courtroom, *supra* note 3 at 12-13, Michell and Mandhane, *supra* note 50 at 660-673.
[52] See Goudge Inquiry, *supra* note 6, Recommendation 136 at 505. Although the Goudge Inquiry questions how far a code of conduct would go in resolving expert impartiality, the Inquiry recommends their use, suggesting that they may not solve the problem, but they would not hurt. The Ontario Rules of Civil Procedure have since incorporated this recommendation. These rules require experts to sign an acknowledgement that they are aware that their duty is to provide an opinion to the Court that is "fair, objective and non-partisan," and that this duty over rides any duty to the party that retained the expert. [*Ontario Rules of Civil Procedure* r 48].

improve their ability to play it and to minimize the impact of expert partiality which further aggravates the lack of capacity issue.

Along with the concern of judicial capacity to apply science-based admissibility criteria, the science and law discussion has questioned the utility of applying these criteria at all. In the next section, I outline the nature of this concern and its applicability to my project.

3(b). Scientific Reliability Constructs do not Characterize 'Science'

As noted, the development of the admissibility criteria in both the United States and Canada saw reliability of evidence become an increasingly central concern in the science and law discussion to account for the prejudicial impact of reliance on evidence 'cloaked' as scientific. The *Daubert* criteria gained prominence in facilitating the determination of reliability of scientific evidence. Recall from the discussion above that the *Daubert* court had reasoned that scientific evidence must be scientifically reliable before it can be admitted. On that basis, the court came up with a set of criteria that could be applied to determine scientific reliability, relying largely on Popper's philosophy of science known as falsification.[53] However, the *Daubert* Court's criteria for scientific reliability have been criticized for being based on an idealized image of science and scientific progress. This criticism prompted a

[53] See Karl Popper, 5th Ed *The Logic of Scientific Discovery* (London: Hutchinson & Co Ltd, 1968). While Karl Popper's theory of falsification is the most prominent philosophical account of science, there are differing philosophical models of science and scientific progress. See for instance, Thomas Kuhn, *The Structure of Scientific Revolution* (Chicago: University of Chicago Press, 1970), or Paul Fayerabend, *Against Method: An Outline of an Anarchist Theory of Knowledge* (London: NLB, 1978). These authors, particularly Thoman Kuhn are usually cited as alternatives to Popper's theory of falsification based on historical and sociological perspectives of science.

line of literature calling for a more nuanced understanding of science that takes into consideration historical, sociological and philosophical accounts of science.[54] Authors have suggested that the *Daubert* Court's reliance on Popper's theory of falsification, which suggest that there is a scientific method which, if followed, makes inquiries legitimately 'scientific,' ignored historical and sociological research that suggests that there is, and cannot be, any "historically stable, prescriptive, and efficacious scientific method doctrine."[55] Consequently, the *Daubert* court's attempt to outline criteria that could be used to determine if evidence was scientifically reliable was arguably contaminated by an unrealistic view of science.

Edmond and Roach's comment that, "[i]n many ways, the question of whether *Daubert* embodies the essentials of genuine science and whether we can develop useful means of demarcating science from other types of knowledge and experience are distractions."[56] While I disagree with the demonstrable reliability standard for admissibility of evidence that Edmond and Roach advocate,[57] I agree with this

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[54] See Sheila Jasenoff, Science at the Bar (Cambridge, MA: Twentieth Century Fund, 1995); Gary Edmond, "Judicial Representations of Scientific Evidence" (2000) 63 Mod L. Rev. 216; David Caudill and Lewis LaRue, *No Magic Wand: The Idealization of Science in the Law* (Lanthan: Rowman & Littlefield, 2006); Susan Haack, "Trial and Error: The Supreme Court's Philosophy of Science" (2005) 95 AMJ Pub Health (Sup. 1) S66. This line of literature explains the debate between science as a representation of natural reality and science as a social, political and historical construct. Though I acknowledge the utility of a more nuanced understanding of science, my purpose herein is not to engage in this debate.

[55] Gary Edmond, "Pathological Science? Demonstrable Reliability and Expert Forensic Pathology Evidence" (Toronto: Government of Ontario, 2007), prepared as a research paper for the Goudge Inquiry [Edmond, Pathological Science] at 4 and for a further development of this argument, see generally 4-12.

[56] Edmond and Roach, *supra* note 9 at 399.

[57] I provide a more thorough comment on Edmond and Roach's approach in "Law's Treatment of Science: From Idealization to Understanding."

comment and the conception that whether something is "scientific" or not is non-essential to the question of *legal* reliability.[58] All evidence, scientific or not, should be subject to the same admissibility standard. Of course, this does not mean that the legal reliability of all evidence can be determined the same way, but the standard of legal reliability should be consistent, irrespective of what type of evidence is being presented. If not, scientific evidence would be subjected to different admissibility rules compared to other evidence, which is contrary to my argument that consistent adherence to legal procedural rules is required to maintain adjudicative legitimacy.

While I recognize that a less idealized, and more nuanced understanding of science on the part of all legal players would benefit the adjudicative process, the crucial element for my project is not that the *Daubert* criteria do not adequately represent true scientific reliability. Rather, the critical element is that the *Daubert* criteria represent an attempt to apply constructs of scientific reliability (erroneous or not), based on an assumption that scientific reliability equates to legitimacy in law. That is, even if the *Daubert* criteria reflect a misunderstanding of 'science,' the idea that scientific constructs should be used to determine admissibility (a legal determination) sends the message from the judiciary that if evidence can be said to be 'scientific,' it is thereby legitimate.

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[58] Here I agree with the comments in Edmond, Pathological Science, *supra* note 55 at 40: "The invocation of scientific method doctrines and casting of empirical investigations as formal attempts at disproof should not become prerequisite to determinations of legal reliability. Instead, questions of admissibility and reliability should be focused on the more fundamental and legally significant question of whether the expert evidence is demonstrably reliable."

This, I suggest, demonstrates a risky preference for scientific reasoning that could result in an inadvertent usurping of legal reasoning and processes.[59] The same deference that is thought to cause the prejudicial over-reliance on science on the part of fact-finders seems to have influenced the judicial solution as well, given the tendency to treat 'scientific' and 'legitimate' synonymously. Noting this judicial sentiment resulted in my thesis: an attempt to determine the source of legitimacy for adjudicative decision-making, and then using that as a starting point to engage in the science and law discussion.

3(c). Overview

The development of both the American and Canadian admissibility constructs illustrates the concerns surrounding the science and law interaction. First, it demonstrates that scientific or otherwise technical expert testimony has two competing elements: on one hand, the legal process is understood to benefit from being up to date with scientific knowledge. This gave rise to the criticism of the *Frye* general acceptance standard, which was thought to be overly restrictive because it would exclude novel science. Similar sentiments of valuing up to date scientific knowledge, even if it is novel science were expressed in the Canadian *Mohan* decision.[60]

On the other hand, there exists a corresponding concern about the prejudicial impact of scientific evidence that is unreliable, though seemingly scientific. In an

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[59] As the thesis progresses, I will demonstrate further why preferring scientific reasoning to legal reasoning is problematic and can result in procedural compromises.

[60] *Mohan, supra* note 10.

effort to allow the court access to up to date science, while also protecting the court from the prejudicial impact of science, admissibility criteria that incorporated scientific constructs of reliability were to be applied by gate-keeping judges. Introduced by the American court in the landmark *Daubert* decision, these constructs were thought to allow novel science into the adjudicative process, and prevent unreliable science from prejudicing it. Reliability of evidence became expressly essential in Canadian admissibility jurisprudence as well, and Canadian courts borrowed from the *Daubert* approach for how to determine reliability of evidence at the admissibility stage. As noted above, this approach has been criticized on the basis that scientific constructs of reliability are not representative of genuine science, and that judges lack the scientific capacity to apply scientific constructs, and assess technical information in which they lack any background. This problem is thought to be augmented by the presentation of expert evidence within an adversarial context.

The concerns surrounding the prejudicial impact of science can be summed up as the danger of the idealization of science – if triers of fact assume that evidence presented by a distinguished scientist is "scientific," they are susceptible to being disproportionately swayed by that evidence, resulting in a distortion of the fact-finding process.[61] In order to curtail the prejudicial impact, trial judges have been tasked with preventing distorting evidence from reaching the trial process. If the

[61] *Mohan, supra* note 10 at paras 19-20.

evidence passes the scientifically reliable test, then it is admissible. If not, then the evidence should be prevented from entering the trial process.

But while the prejudicial effect of science is thought to arise from triers of fact being susceptible to idealize science and unduly defer to scientific evidence, the gate-keeping solution provided similarly displays an idealization or over-confidence in science by incorporating scientific constructs into legal reasoning, suggesting that scientific reliability brings legitimacy to evidence. Noting this judicial sentiment that scientific reliability equates with legitimacy induced my desire to reflect on the source of law's legitimacy, eventually leading to my thesis that consistency in procedure is integral to maintaining the legitimacy of adjudicative outcomes, so the science and law interaction should be considered keeping procedural legitimacy in mind. In the upcoming section, I attempt to validate my discussion of procedural legitimacy and its applicability to science and law by illustrating the emphasis on substantive accuracy and the corresponding under-emphasis on procedural accuracy, and the negative impact that this can have by way of compromise to legitimate adjudicative outcomes.

Part 4. Situating Procedural Legitimacy in the Science and Law Landscape

It is not uncommon to hear that truth seeking is the primary purpose of the trial process.[62] This premise causes authors to evaluate the adversarial process in terms

[62] See for example Alan Bryant, Sidney Lederman & Michelle Fuerst, *Sopinka, Lederman & Bryant The Law of Evidence in Canada,* 3ed (Markham, Ontario: LexisNexis Canada Inc, 2009) at 12: "The essential purpose and feature of the trial system in our society is the search for truth."

of its ability to achieve outcomes that are consistent with truth, or factually accurate. Philosopher of science and epistemologist, Larry Laudan, studies the effectiveness of the criminal trial process against this measure.[63] Understanding truth as an essential pre-condition of justice, Laudan starts with the premise that trials are "first and foremost" truth-seeking enterprises[64]. Accordingly, he defines errors in the trial process as instances where the outcome of a trial is inconsistent with factual accuracy. For Laudan, there are two types of errors that can occur in the criminal trial process: a factually guilty person is deemed innocent, or a factually innocent person is deemed guilty.[65] His interpretation of these two scenarios as errors leads to his framework for evaluating the procedural rules of evidence based on whether they minimize these errors by promoting accuracy in fact-finding.

However, by limiting the definition of "error" to adjudicative outcomes that are inconsistent with factual accuracy, or what really happened, Laudan's study disregards the potential for procedural compromises that might inadvertently *improve* factual accuracy. He does not consider, for instance, the situation of a trier of fact relying on inappropriately admitted evidence, resulting in a factually guilty person appearing to be *more* guilty. If, for instance, the fact-finder relies on improperly admitted evidence, and finds the factually guilty accused guilty, then the procedural error of admitting improper evidence could be said to have enhanced the factual accuracy of the outcome. Laudan's approach would not define this

[63] Larry Laudan, *Truth, Error and Criminal Law: An Essay in Legal Epistemology* (Cambridge, New York: Cambridge University Press, 2006) [Laudan].
[64] *Ibid* at 6.
[65] *Ibid* at 9-10.

compromise of procedure as an error of the trial process. I suggest that this omission arises from an over-emphasis on substantive accuracy in the legal process coupled with an under-emphasis on appropriate adherence to procedure.

The emphasis on achieving factually accurate outcomes is evident in the science and law discussion as well. Understanding science as a facilitator for arriving at factual accuracy, and under-emphasizing the significance of maintaining consistent application of legal procedures, alterations to the adversarial process have been offered as potential methods to better accommodate science in the courtroom. I have already indicated that the incorporation of science-based admissibility constructs reflects a risky preference for scientific procedure over consistent application of legal procedure rules. A well, recall from my previous discussion that authors have suggested alterations to adversarial procedure where scientific evidence is involved.[66] This exposes a susceptibility to compromise legal procedures in an effort to maintain scientifically accurate adjudicative outcomes, which, presumably, is thought to make adjudicative outcomes more likely to be factually or substantively accurate.

Susan Haack's contributions[67] to the science and law discussion provide a useful illustration of the impact of over-emphasizing factual or substantive accuracy when

[66] See Part 3(a) of this chapter.
[67] To illustrate Susan Haack's contribution, I rely on: Susan Haack, "Irreconcilable Differences? The Troubled Marriage of Science and Law" (2009) 72 Law & Contemp Probs 1 [Irreconcilable Differences]; Susan Haack, "Truth and Justice, Inquiry and Advocacy, Science and Law" in *Putting Philosophy to Work - Inquiry and its Place in*

considering the science and law interaction.[68,69] Haack's project is to consider the fundamental nature of both science and law in order to appreciate the interaction between the two fields.[70] Presumably, a fundamental appreciation of both fields would reveal the most foundational reason for the tension between them, and thereby illuminate how best to resolve the tense interaction between science and law. In her discussion, Haack defines science as being fundamentally in the business of seeking truth, and asserts the legal process, being a more constricted form of inquiry, cannot be as effective at truth-seeking as science.[71] But she maintains the premise that factual truth is essential to justice, and, therefore, to the legal system as the administrator of justice: "Substantive justice," Haack advises, "requires factual truth."[72] And to determine these truths, law increasingly seeks the assistance of science.[73] With that as her starting point, Haack concludes that if there is to be some

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Culture (Amherst, New York: Prometheus Books, 2009) [Truth and Justice]; and "Entangled in the Bramble-Bush, Science in the Law" in Susan Haack, *Defending Science Within Reason* (Amherst, New York: Prometheus Books 2003) at 233 [Entangled in the Bramble-Bush].

[68] Susan Haack's contributions provide a useful illustration of deference to science resulting in an under-emphasis on procedure, but other authors have come to similar conclusions. For a similar argument to Susan Haack's see, Joseph Sanders, "Science, Law, and the Expert Witness" (2009) 72 Law & Contemp Probs 63. In addition, I have commented in "Law's Treatment of Science: From Idealization to Understanding" that Edmond and Roach's proposed solution of asymmetrical admissibility criteria in Edmond and Roach, *supra* note 9, is an undue compromise to legal procedure.

[69] My comment in "Law's Treatment of Science: From Idealization to Understanding" contains a more thorough critique of the approaches of Susan Haack and Edmond & Roach on the basis of an under-emphasis on procedural legitimacy.

[70] Irreconcilable Differences, *supra* note 67 at 2.

[71] Irreconcilable Differences, *supra* note 67.

[72] Truth and Justice, *supra* note 67 at 1.

[73] Entangled in the Bramble-Bush, *supra* note 67 at 237.

solution to the tension between science and law, then the likely solution is to make amendments to the usual legal procedures where scientific evidence is relevant.[74]

Surely it is true that substantive justice requires factual accuracy, and science can be useful to ascertaining factual accuracy. However, like Lauden's approach explained above, this under-emphasizes the necessity of procedural consistency in maintaining legitimate adjudicative decisions. The emphasis on "truth-seeking" as the primary goal of the trial, and the corresponding emphasis on substantive or factual correctness is not, of course, itself improper. But when it is accompanied with an under-emphasis (or altogether disregard) for procedural legitimacy, it is problematic. It is problematic because it ignores the significant role that consistency in procedure plays in maintaining the legitimacy of adjudicative decisions that may or may not be factually accurate.

The argument of procedural legitimacy is premised on the observation that although it is creditable to strive for factual accuracy, legal decisions are made in conditions of uncertainty; factual accuracy is inherently elusive. As Haack points out, the legal inquiry is a restrictive one. It is constrained by time and economic restrictions, which must be balanced with the need to make final and legitimately binding legal determinations. These restrictions, along with other policy considerations that may restrict what evidence is available to triers of fact[75] necessitates that legal decisions

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[74] Irreconcilable Differences, *supra* note 67.

[75] David Paciocco and Lee Stuesser, *The Law of Evidence* Revised 5ed, (Toronto: Irwin Law Inc., 2008) at 2: "For example, the rule preventing the tribunal from

are made on the basis of whatever fragments of relevant evidence are available and admissible. In other words, legal decisions are made in circumstances of uncertainty because events of the past will have to be reconstructed based on unavoidably incomplete evidence.

Due to the conditions of uncertainty, there exists a risk of inaccuracy in legal fact-finding – events may be found as 'legal facts' that are not factually accurate, because legal facts can only be based on the evidence that is available. This risk of factual inaccuracy is implicit in the burden of proof, which allows a legal fact to be found on the basis of a likelihood or probability, as opposed to certainty. The civil burden of proof, for instance, accepts events as legal 'facts' if the evidence establishes that the event *probably* occurred. This leaves a relatively high possibility (up to 49%) that the event did not occur at all, yet the event is established as a legal fact. And since the substantive law is applied to the legal 'facts' established through adjudicative fact-finding process, there exists an inescapable risk of substantively inaccurate adjudicative outcomes.

This means that situations will arise wherein a plaintiff who was wronged in reality is not able to come up with enough evidence to prove that she was more likely

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considering some unconstitutionally obtained evidence exists to ensure that the trial process is fair and that the administration of justice remains unsullied by police misconduct. Denying such evidence to the trier of fact can impede accurate fact finding because the excluded evidence may be relevant and probative of the facts in issue. Yet the evidence is rejected because competing considerations are given priority over the value in coming to a correct disposition of the matter in controversy."

wronged than not, and her case will be dismissed. Or, the situation could arise where evidence suggests that a factually innocent defendant appears more likely than not liable, and he will be found legally liable to the plaintiff. These factually inaccurate outcomes are considered legitimate adjudicative decisions despite the factual inaccuracy. The justification for these outcomes lies in appropriate adherence to legal procedure in finding the relevant legal facts. If the processes of adjudicative fact-finding were applied consistently and appropriately, then the events found to be legal facts are legitimate, whether or not they are substantively accurate, and the application of the substantive law to those facts to come up with a legal determination is also legitimate.

Thus, while I agree that *substantive* justice is dependent on factual truth, and thus wrongful convictions cause jeopardy to the legal system and must be vigilantly investigated, the inability to guarantee factual truth necessarily means that overall the legal system maintains its legitimacy through procedural propriety. I suggest, therefore, that procedural legitimacy must be considered an indispensable counterpart to the substantive justice that the legal system endeavors (but cannot guarantee) to uphold. This is the perspective that I seek to apply to the science and law discussion.

Part 5. Conclusion

The primary purpose of this chapter was to set out the concerns that have impacted and influenced the science and law interaction and to situate my upcoming discussion in that landscape. Science is both probative and prejudicial. It is

probative because scientific knowledge can be useful in determining relevant facts, and this is particularly so as scientific knowledge continues to expand, and scientifically grounded litigation has become increasingly common. The legal process is also susceptible to be prejudiced by science, particularly if experts testify outside the scope of their expertise and if the evidence they present is unreliable. The science and law discussion is aimed at finding the best way to balance the probative and prejudicial impacts of scientific evidence. In that effort, trial judges have been called on to minimize these sources of prejudicial impact of scientific evidence by appropriately scrutinizing the expert's qualifications, and assessing the scientific reliability of evidence at the admissibility stage.[76] This approach has been criticized on the basis that these criteria are ill representative of 'scientific' reliability, and on the basis that judges lack the scientific literacy to apply scientific constructs in a way that is meaningful to determining the reliability of scientific evidence. Moreover, the adversarial presentation of scientific evidence adds to the difficulty of comprehending the already confusing evidence presented. This has led commentators to suggest adjustments to the adversarial process where scientific evidence is involved.

[76] Goudge J's elucidation of the *Mohan* test in the Goudge Inquiry, *supra* note 6, clarifies the nature of what ought to be considered in scrutinizing the expert's qualifications. But, at least conceptually, it has always been part of the admissibility of expert evidence that the expert be qualified, because this qualification is what allows his opinion to be admitted as an exception to the exclusion of opinion evidence. Qualification of the witness has also always been part of the American development, as discussed above.

I have suggested that the efforts to curb the prejudicial impact of science are premised by the notion that the goal of a trial is ascertaining what truly occurred, so that a substantively accurate legal determination can be achieved. While factual accuracy is obviously not irrelevant to the adjudicative process, given the conditions of uncertainty that legal decisions are made in, factual accuracy cannot be guaranteed. Procedural accuracy has an indispensible role in maintaining legitimate adjudicative outcomes, and must not be underemphasized in the science and law discussion. Therefore, I approach the concerns that define the science and law discussion from the perspective of procedural legitimacy.

In my upcoming chapters, I will demonstrate the significance of consistent and proper adherence to legal procedure in maintaining the legitimacy of adjudicative outcomes. I will begin by setting out the procedural legitimacy argument generally, and will then demonstrate its applicability in the more specific context of determining damages entitlements in the personal injury context. Thereafter, I will attempt to address the concerns surrounding the prejudicial impact of scientific evidence with a view to endorsing a solution to the science and law interaction that maintains procedural propriety.

Chapter 2. The Significance of Procedural Legitimacy

Chapter Overview

Introduction

Part 1. The Basis of Procedural Legitimacy
- a. Legal Fact-finding
- b. Evidentiary Gaps
- c. The Burden of Proof Accommodates Evidentiary Gaps
- d. Procedural Legitimacy: Legitimacy Despite Uncertainty

Part 2. Judicial Commitment to Procedural Legitimacy
- a. Scientific Uncertainty and Proving Causation: *Snell, Athey, Resurfice, Clements*
- b. Judicial Treatment of 'Loss of Chance': *Lafferiere, Gregg v Scott*
  - i. Supreme Court of Canada: *Lafferiere v Lawson*
  - ii. House of Lords: *Gregg v Scott*
- c. Summing Up the Judicial Commentaries

Part 3. Conclusion

Introduction

The aim of this thesis is to apply the perspective of procedural legitimacy to the science and law discussion. This chapter is intended to validate my end-goal by demonstrating the significance of procedural propriety in maintaining the legitimacy of adjudicative outcomes, and, thus, to defend my claim that procedural legitimacy must not be under-emphasized in the quest to achieve more 'science-friendly' courts. In this chapter, I outline the argument that consistent adherence to procedure is integral to legitimate legal decision making; this is the heart of my project.

My discussion below is divided into two parts. First, I provide the basis of the procedural legitimacy argument. This occurs essentially through a description of the process of adjudicative decision-making, emphasizing the procedures of legal

fact-finding, which underlies the ultimate outcome. As my project developed, the fairly simple task of describing the adjudicative process led me to question the source of legitimacy of the legal system, and to the conclusion that consistent adherence to legal procedure is a central source of that legitimacy. I demonstrate this development in Part 1. The essence of the argument is that the conditions of uncertainty in which adjudication takes place results in the inevitability of substantive inaccuracy.[1] Despite this risk, adjudicative outcomes are legitimate on account of consistent adherence to procedure. In Part 2, I provide brief discussions of a number of cases decided by the Supreme Court of Canada and the British House of Lords that highlight the significance that consistency in procedure bears in maintaining acceptable adjudicative outcomes. The cases arise in the context of personal injury litigation, where there is scientific or medical uncertainty as to whether the defendant's negligent act caused the plaintiff's injury. These cases, therefore, provide a topical demonstration of procedural legitimacy within the science and law context.

Part 1: The Basics of Procedural Legitimacy*

1(a). Legal Fact-finding

Adjudicative decision-making occurs through a process of fact-finding. Legal facts are established and the relevant law is then applied to those facts to determine a legal outcome. For instance, in a civil action in tort, the plaintiff must establish that

*Parts of this section were developed earlier in "Law's Treatment of Science: From Idealization to Understanding," submitted for course credit in Science and Law, Fall Term, 2011-2012.

[1] Throughout my thesis, I use the phrase 'substantive inaccuracy.' This is essentially synonymous with factual inaccuracy: when I say that legal facts or legal outcomes are substantively inaccurate, I mean that they are inconsistent with factual reality

the defendant, who owed a duty of care, in fact acted negligently, causing the plaintiff's injury. The legal outcome will depend on whether or not these facts are established. If they are established, then the legal outcome will be a finding of liability, and the defendant will be required to fully compensate the plaintiff for her losses, which will then be quantified. If the requisite legal facts cannot be established, the legal outcome will be that liability cannot attach, and the plaintiff will not be compensated. Similarly, in the criminal context, only when the fact-finding process culminates in a finding that the accused person had the requisite intention to commit a crime, as defined by the Criminal Code, and the crime was, in fact, committed by the accused, that a legal finding of guilt can be made, and sentencing can occur.

Fact-finding is the essential first step to adjudicative decisions. Substantive legal principles are applied to the legal facts as determined through the fact-finding process. The application of the substantive law to the legal facts eventually dictates the litigant's legal entitlements and obligations. Accurate fact-finding is obviously important to the legal process. As Stein puts it, "accuracy in fact-finding is a logical pre-requisite to proper administration of the controlling substantive law."[2] If adjudicative decision-makers were consistently inaccurate in their fact-finding, their subsequent application of the substantive laws would be based on errors, making protection of substantive rights impossible. Since protection of substantive rights must be an aim of the adjudicative process, promoting accuracy in fact-finding must

[2] Alex Stein, *Foundations of Evidence Law* (Oxford, New York: Oxford University Press, 2005) at 2 [Stein].

also be fundamental to that process. Consequently, it is creditable that ascertaining the truth, or being accurate in fact-finding, is emphasized as a goal of the adjudicative process. It is understandable also that the truth-seeking goal underscores the science and law discussion, as noted in the previous chapter.

But the adjudicative process cannot guarantee accuracy in fact-finding. Constrained by the need for timely dispute resolution, economic limitations, and other causes of factual error that exist within the adjudicative process, fact-finding necessarily occurs in circumstances of uncertainty.[3] This uncertainty can be described as 'evidentiary gaps' – the factual events relevant to the tort or crime are reconstructed based on whatever pieces of evidence are available to the trier of fact, which is necessarily incomplete. Due to evidentiary gaps, there exists the potential for inaccurate fact finding.

1(b). Evidentiary Gaps

Evidentiary gaps have a number of sources.[4] First, there is the practical issue that crimes or civil claims usually arise from events that occurred in the past, so it is not possible to simply reconstruct the observation of an event and determine what happened. Rather, determining what happened must be pieced together, by relying

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[3] *Ibid*.

[4] Larry Laudan, *Truth, Error and Criminal Law: An Essay in Legal Epistemology* (Cambridge, New York: Cambridge University Press, 2006) at 16 [Laudan]. In the discussion to follow, I refer to Laudan in respect of his description of the adjudicative process, which I found illuminating and helpful. However, my supposition of procedural legitimacy is contrary to Laudan's ultimate purpose, which is premised on the truth-seeking function of a trial, and ultimately seeks to minimize adjudicative inconsistencies with factual reality, or truth, as explained in the preceding chapter.

on whatever evidence exists, and is admissible at the time of the trial. This practical limitation is particularly relevant in the science and law interaction. Consider, for instance, a case where some cutting edge scientific technique could provide information that might help determine whether a relevant fact occurred or did not occur. However, the technique is not developed well enough at the time of the trial. Science, being an iterative process, has the luxury of undertaking further testing, further inquiry, and further experimentation, to develop the technique. But law does not have that luxury – legal decisions need to be made relatively quickly so that disputes can be appropriately resolved. Therefore, the legal decision cannot wait for the scientific advancement to occur.[5] This can be considered an evidentiary gap, due to the limitations of scientific knowledge. This issue is explored further in Part 2, where I discuss judicial commentary on the impact of scientific limitations on legal fact-finding.

Along with the practical imperative of quick and efficient adjudicative outcomes, legal admissibility rules sometimes restrict what might otherwise be relevant evidence[6], in order to protect some other legal principle. For instance, incriminating

[5] Susan Haack has described this difference between law and science as one reason for the tense relationship between the two fields. See Susan Haack, *Irreconcilable Differences*? *The Troubled Marriage of Science and Law*" (2009) 72 Law & Contemp Probs 1 [Irreconcilable Differences].

[6] The basic rule of admissibility is that a trier of fact can consider evidence that has any tendency to prove or disprove a fact in issue. This principle was stated in *R v Collins* [2001] 160 CCC (3d) 85, OJ no 3894 (QL) (Ont CA) at paras 18-19 as: "Relevance is established at law if, as a matter of logic and experience, the evidence tends to prove the proposition for which it is advanced. The evidence is material if it is directed at a matter in issue in the case. Hence, evidence that is relevant to an issue in the case will generally be admitted." Establishing the relevance and

evidence that is obtained through an improper search or seizure is constitutionally inadmissible,[7] even if the evidence obtained from the improper search would reduce the factual uncertainty surrounding the truth of the crime. Similarly, evidence subject to privilege is not admissible.[8] Therefore, facts must be found without that evidence, despite the fact inadmissible evidence could serve to enhance the accuracy of fact-finding. In short, the legal system must accept the inevitability of evidentiary gaps, and sometimes it even causes them. Hence, adjudication operates within the tense context where accuracy is undoubtedly desirable, but legal decision-making occurs in conditions of uncertainty, resulting in the possibility of inaccuracy.

1(c). The Burden of Proof Accommodates Evidentiary Gaps

The legal system's acceptance of these conditions is self-evident when considering that the process of legal fact-finding occurs through the burden of proof. The burden of proof allows legal facts to be found on the basis of something less than certainty. In civil cases, based on the balance of probabilities standard of proof, an event is considered a legal fact if it is more likely to have occurred than not.[9] For

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materiality of evidence is not onerous – there is no minimal probative value that must be established for evidence to be relevant. (See *R v Watson* [1996] 108 CCC (3d) 310, OJ no 2695 (QL) (Ont C.A.) at para 32.

[7] *Canadian Charter of Human Rights and Freedoms*, Part 1 of the Constitution Act, 1982, being Schedule B to the Canada Act 1982 (UK), 1982, c 11, s. 8. For a further explanation of the evidentiary principles surrounding improperly obtained evidence, see See David Paciocco and Lee Stuesser, *The Law of Evidence* Revised 5ed, (Toronto: Irwin Law Inc., 2008) at Chapter 9 [Paciocco and Stuesser, *Evidence*].

[8] For a discussion of the evidentiary principles of privilege, see Pociocco and Stuesser, *Evidence*, *ibid* at 7.

[9] The balance of probabilities standard is also sometimes referred to as 'proof on a preponderance of probabilities' or 'proof on a preponderance of evidence.' According to Bryant, Lederman & Fuerst, *Sopinka, Lederman & Bryan, The Law of Evidence in Canada*, 3ed, (Markham: LexisNexis Canada Inc, 2009) at 202: "practically speaking, nothing turns on which term is used" [Bryant et al, *Evidence*].

instance, if is more likely than not that the defendant's negligence caused the plaintiff's injury, then causation is taken to be a legal certainty – it is established as a legal fact. That means that in civil cases, a chance of factual inaccuracy of up to 49% is accepted. That is, there is up to a 49% chance that an event found as a legal "fact" may not be a fact in reality. Still, the substantive principles of tort liability will then be applied on the basis that those legal facts are certain – the determination of liability will be made on the basis that the causal link has been established as a fact. In the criminal context, elements of crimes have to be established "beyond a reasonable doubt." For the sake of illustration, assume that this means the standard of proof is 95%. If the trier of fact concludes that he is anywhere from 0-94% sure that the accused committed the crime, then he has to acquit the accused, even though there could be quite a high likelihood that the accused did commit the crime.

Finding facts on the basis of the burden of proof can thus result in adjudicative decisions that are factually inaccurate. For instance, the situation could arise where a plaintiff is wronged in reality, but the evidence presented does not suggest that she was more likely wronged than not. The legal determination will be that the plaintiff's case must be dismissed, because the necessary legal facts could not be established to the requisite standard of proof. Similarly, suppose it was impossible to know for sure whether a defendant had acted negligently. Still, if the evidence available convinces the trier of fact that a factually innocent defendant *probably* acted negligently resulting in an injury to the plaintiff, then the defendant would be

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Throughout this thesis, I refer to the civil standard of proof as the "balance of probabilities" or the "more likely than not" standard.

found liable to the plaintiff, despite the factual uncertainty over whether he, in fact, acted negligently or not. This means that the defendant could be factually innocent, but is still found liable, resulting in a substantively inaccurate outcome.

The potential for these outcomes is contemplated by the principle of legal fact-finding – legal facts are to be established to a 'less than certain' standard of proof, and once so established, they are treated as certainties for the purpose of arriving a legal conclusion. By accepting this procedure for legal fact-finding, which underlies adjudicative outcomes, the legal system, and all those governed by it, accept the risk that adjudicative decisions may be factually inaccurate. And even where factual inaccuracy occurs, we accept such decisions as legally valid – anyone with even a minimal familiarity with the adjudicative process would agree that if a plaintiff cannot prove his case to the requisite standard of proof, his case must be dismissed, whether or not he was actually wronged. But what is the basis for accepting that such adjudicative outcomes are legitimate, despite the substantive inaccuracy?

1(d). Procedural Legitimacy: Legitimacy Despite Uncertainty

One way to answer this question is to accept that uncertainty in fact-finding is simply unavoidable, and the burdens of proof represent a fair allocation of the risk that erroneous fact-finding occurs. Stein explains that the inevitable uncertainty in adjudicative fact-finding necessitates facts to be found on the basis of probabilities.[10] Because fact-finding is based on probabilities as opposed to certainty, there is a risk that an act or event that is found as a fact for legal purposes

[10] Stein, *supra* note 2 at 2.

is not a fact in reality. The legal system, therefore, must choose how to fairly allocate the chance of fact-finding errors occurring.[11] Laudan has described this as the "error distribution."[12] The distribution of error is most clearly understood by considering the burdens of proof as representing what lawmakers have determined to be a fair distribution of error.

Assume again that the burden of proof in the criminal context is 95% - the prosecution has to show that the accused is 95% likely to be guilty. This means that if there is an error, it is much more likely to fall on the side of not-guilty than guilty, because if an accused is found guilty, there should only be a 5% chance that the accused is actually innocent. It is much more likely that the accused is *erroneously* found to be not-guilty than *erroneously* found to be guilty. The risk of error is therefore distributed largely in favour of the accused. Society will bear the greater risk of errors, because law- makers have decided that wrongful convictions are to be more strenuously avoided than false acquittals.[13] Based on the same principle, in civil cases, setting the burden of proof at 51% means that if an error (i.e., a legal fact is found that does not correspond to what really happened) is to occur, it is just slightly more likely to occur in favour of the defendant. If there is to be an error, it is very slightly more likely that the error will detriment the plaintiff, as lawmakers

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[11] *Ibid*.
[12] Laudan, *supra* note 4 at 123.
[13] Bryant et al, *Evidence, supra* note 9 at 203, "society values the liberty of the individual very highly and requires a greater degree of certainty to protect against erroneous convictions." (The 'certainty' that Bryant et al refer to is not factual certainty in general, but a greater degree of certainty, or greater likelihood, as to the guilt of the accused.)

have decided that the claimant should bear slightly more of the risk of erroneous fact finding.[14]

So far, the discussion in this part can be summarized thus: there is uncertainty in adjudicative fact finding; uncertainty means that there is a risk of error; this risk ought to be fairly allocated among litigants. This seems to be an accurate description of how the legal system handles its conditions of uncertainty. This description is incomplete, however, because it suggests that conditions of uncertainty result in the legal system being inevitably flawed, and that fair allocation of the risk or error is the band-aid covering the errors that will inevitably result. I suggest, however, that when adjudicative decisions are made based on legal facts that do not correspond with actual reality, such decisions are not thereby illegitimate or erroneous. Adjudicative decisions made based on inaccurate fact-finding are legitimate and acceptable legal decisions *because, and as long as*, the appropriate rules of procedure were applied during the fact-finding process. I argue that if the legal facts were found to be legal facts in accordance with all the applicable rules of legal fact-finding, it is legitimate to apply the substantive legal principles to those facts. So long as the procedures of fact-finding were adhered to, and the legal principles were appropriately applied, the adjudicative decision is

[14] Regarding the civil standard of proof, Bryant et al*,* in *Evidence, supra* note 9 advise at 203 that "the plaintiff normally bears the persuasive or legal burden of proof because he or she is attempting to change the status quo…Since society is indifferent whether the plaintiff or the defendant wins a particular civil suit, it is unnecessary to protect against an erroneous result by requiring a standard of proof higher than a balance of probabilities."

legitimate, even if it does not correspond with factual reality. This is the argument of procedural legitimacy.

The legal process implicitly recognizes that adjudicative outcomes that do not correspond with factual reality can still be legitimate. This proposition may seem distasteful because a legal outcome that does not correspond with factual reality (for instance, a wronged plaintiff is left uncompensated, or a criminal avoids legal consequence) naturally causes a perception of injustice, because it seems that the legal system was unable to uphold its substantive law. But the legitimacy of legal outcomes that are factually inaccurate becomes more palatable by acknowledging that the standards of proof, which anticipate uncertainty in fact-finding, are part of the substantive law: what has to be proven and to what extent it has to be proven for the purposes of adjudicative decision-making are defined by the applicable substantive law.[15] For instance, substantive criminal law dictates that to convict an accused of assault, the accused's intention to assault, along with the assault itself, must be proven beyond a reasonable doubt. In the civil context, to grant a remedy for an action in negligence, the substantive law of tort dictates that existence of a duty of care, negligent breach of standard of care, causation (including lack of

[15] See for example, Bryant et al, *Evidence*, *supra* note 13 at 85: "The Rules Relating to the burdens of proof are largely governed by the substantive law." See also John Henry Wigmore, *Evidence in Trials at Common Law*, Vol. 9, revised by James H. Chadbourne (Boston: Little, Brown & Co., 1981) at 2486, cited in *Snell v Farrell* (1990), 72 DLR (4th) 289, SCJ no 73 (QL) at 16: "The legal or ultimate burden of proof is determined by the substantive law 'upon broad reasons of experience and fairness."

remoteness), and harm must all be proven on a balance of probabilities - "more likely than not." [16]

When the evidence establishes the elements of the substantive law to the relevant standard of proof, these elements become legal facts - they are understood to be proven, and are accepted as facts in the legal context. The law is then enforced (a conviction or acquittal is entered, a remedy is allowed or disallowed) based on the concoction of legal facts that have been established by measuring the presented evidence up to the standard of proof (which is a standard less than certainty). Fact-finding is thus a process dedicated to finding *legal* facts for the purpose of vindicating *legal* rights and enforcing legal duties. The substantive elements of the law - *including the standard of proof* - define those rights and obligations. Consequently, when the procedures of legal fact-finding are appropriately applied, whereby the fact-finder makes a decision based on the evidence that is properly before him at trial, and through appropriate reliance on that evidence, determines whether the elements of the tort or crime have been established to the extent required by the relevant standard of proof, the substantive work of the legal system is being accomplished. Whether the adjudicative decision corresponds with factual reality does not *itself* compromise the legitimacy of the resulting adjudicative decision, because that possibility is contemplated by the standards of proof that are

[16] For a concise and accessible overview of the basic principles of negligence law, see Philip Osborne, *The Law of Torts* (Toronto: Irwin Law Inc., 2011), Chapter 1 [Osborne, *Torts*].

required to be satisfied in order to find legal facts. That is why decisions that are factually inaccurate can still be considered legitimate adjudicative outcomes. When, then, is a legal decision improper or illegitimate? If there were some procedural problem with what evidence was relied on and how it was construed, then the adjudicative outcome cannot be considered valid. For instance, if a jury relied on evidence that it should not have, or if they misunderstood the standard of proof and did not measure the evidence against it appropriately, then the resulting decision is not valid[17]. And of course, if the substantive law is altogether misapplied, the adjudicative outcome is thereby improper. For instance, in a civil action, if a judge found that causation was not established on the balance of probabilities, but found that the defendant was nonetheless liable to the plaintiff, such an outcome is intolerable because it misapplies the law to the legal facts. Or, if an accused person was convicted despite a finding that he did not have the requisite intention to commit the crime, then such a conviction must be improper. But when the procedures of legal fact-finding are appropriately followed (evidence is properly admitted and measured up against the correct standard of proof), it is legitimate to make a legal determination on the basis of those legal facts. So when the substantive law is appropriately applied to those legal facts, the outcome is legitimate. This remains the case whether or not the legal facts that gave rise to the decision correspond with factual reality. This is the basis for my argument that procedural propriety must not be given second place to substantive accuracy in order to maintain the legitimacy of the adjudicative process and its outcomes.

[17] *Ibid*.

I reiterate here that I do not argue that the legal system is not concerned with the truth or factual accuracy at all. Three categories of views about the relationship between truth and law were recently presented in a lecture delivered by Hon J Spigelman, Chief Justice of New South Wales.[18] I find these categories to be useful reference points to enable a proper characterization of my argument. The first view is that the adversarial process is concerned only with 'procedural truth' or 'legal truth,' as opposed to substantive fact. The second is that the adversarial system is the most effective truth-seeking mechanism. And third, that the adversarial process seeks truth, though its pursuit of truth is qualified.[19] Although my discussion above may seem to situate my argument within the first category, suggesting that procedural 'truth' is the only concern of the legal system, I characterize my discussion as falling within the third category, though recognizing the significance of the first.

As Justice Spigelman states, "the recognition that the principal purpose of legal proceedings is to identify the true factual circumstance of any matter in dispute is of fundamental significance for the administration of justice and the maintenance of public confidence in that system."[20] It seems impossible to disagree that the adversarial process would *seek* truth. But it is also impossible not to recognize that its inquiry into truth is significantly qualified and restricted. Because these qualifications and restrictions are the necessary conditions of legal decision-making,

[18] Hon J J Spigelman AC, "Truth and the Law" 85 ALJ 746, The Sir Maurice Byers Lecture, delivered at the NSW Bar Association on 26 May 2011 [Spigelman Lecture].
[19] *Ibid* at 748.
[20] *Ibid* at 750.

ascertaining the truth cannot be guaranteed, yet final and binding adjudicative decisions have to be made. The need to reconcile these realities of the adjudicative process is the source of significance for the argument of procedural legitimacy: though the legal process aims to ascertain truth, its ultimate inquiry ends with a legal determination that is legitimately final and binding, as long as the decision was made with procedural propriety, and whether or not truth was actually achieved.

Judicial commentaries have recognized and affirmed the significance of procedural propriety through their steadfast resistance to tampering with the established principles of legal fact-finding. This commitment has been particularly evident in the context of personal injury litigation, where medical and scientific uncertainty causes a perception of undue evidentiary disadvantage for plaintiffs. In the next Part, I review the court commentary presented in these cases. This will provide a topical demonstration of the significance given to consistent application of legal principle to facts found in accordance with the procedures of legal fact-finding to maintain the legitimacy of the adjudicative process and the outcomes it produces, even in the face of medical/scientific uncertainty.

Part 2. Judicial Commitment to Procedural Legitimacy

My discussion above ended with the proposition that procedural propriety in fact-finding and principled application of substantive law ensures that litigants are presented with legitimate adjudicative decisions, despite the conditions of uncertainty in which they are made. Both the House of Lords and the Supreme Court of Canada have endorsed this suggestion in their commentaries regarding

factual causation, particularly in cases involving personal injury litigation. Cases where a plaintiff suffered a personal injury often turn on the factual inquiry into whether the negligence of the defendant can be said to have caused the plaintiff's injury.

In any action in negligence, even where a plaintiff can prove that a duty of care was owed, the standard of care was negligently breached, and an injury occurred, liability is not established unless a causal link between the negligent act and the injury can be demonstrated. The inquiry into causation is typically based on the "but for" test – if the plaintiff can establish that the injury would not have occurred 'but for' the negligent conduct, causation is established.[21] Injured plaintiffs would be hard-pressed to establish the requisite causal connection between the negligence and their injury without relevant medical evidence. However, despite significant advancement in the nature of medical knowledge, the "complexity of the human body and the uncertainties which still surround its nature…exacerbate the overwhelming task that the plaintiff often has in proving that the defendant's conduct was the factual cause of the injury."[22]

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[21] Lewis Klar, *Tort Law*, 3ed (Toronto: Carswell, 2003) at 389-392 [Klar, *Tort Law*]; Osborne, *supra* note 16 at 53. See also *Clements v Clements,* 2012 SCC 32 *(*unreported), where the Supreme Court of Canada had its most recent opportunity to discuss the substantive law of causation, affirming that the primary test for causation remains the 'but for' test.

[22] Ellen I. Picard & Gerald B. Robertson, *Legal Liability of Doctors and Hospitals in Canada,* 4th ed (Ontario: Thompson Carswell, 2007) at 269 [*Legal Liability of Doctors and Hospitals*].

At times, these medical uncertainties have been interpreted as unduly onerous on plaintiffs, and courts have had to wrestle with how to account for medical/scientific uncertainty in this context.[23] In these cases, courts have been asked to consider whether any changes to legal principles and procedures would be justified in order to account for medical and scientific uncertainty. For instance, courts have considered shifts in the burdens of proof, new substantive tests for establishing the link between negligence and injury, or the introduction of the loss of chance doctrine (all of which I explain below), as novel methods of accounting for medical and scientific uncertainty with respect to factual causation in the personal injury context. Both the House of Lords and the Supreme Court of Canada have demonstrated their commitment to consistent adherence to the procedures of legal decision-making, holding that departing from the established principles of legal fact-finding and judicial decision making to accommodate scientific or medical evidentiary uncertainty would not be justified. This, I suggest, is an implicit endorsement of procedural legitimacy.[24]

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[23] *Ibid* at 271.

[24] In the upcoming section, I discuss cases that can be classified as medical negligence actions. My discussion does not provide a comment on any issues specific to medical negligence law. I use medical negligence cases to illustrate judicial commitment to procedural legitimacy, in a context where scientific evidence is relevant. A commentary on practical concerns associated with medical negligence law, which may include issues of access to justice for plaintiffs or resource disparities among parties, is not within the scope of my discussion. For more information on medical negligence law in Canada, see Picard & Robertson, *Legal Liability of Doctors and Hospitals, supra* note 22.

2(a). Scientific Uncertainty and Proving Causation: Snell, Athey, Resurfice, Clements

The Supreme Court has demonstrated its commitment to the established procedures of legal fact-finding, including who bears the onus of proof, and the standard of proof required, in its interpretation of the House of Lords' *McGhee v National Coal Board*[25] decision, which dealt with medical uncertainty in the personal injury context. In that case, the plaintiff contracted dermatitis after working in a dusty worksite with no washing facilities. He sued his employer for damages resulting from the dermatitis. The employer was found negligent because no showers were provided at the work site, resulting in workers travelling home caked in sweat and dust. The expert evidence could only say that the negligent conduct of the defendant "materially increased the risk" of the plaintiff contracting dermatitis, but was inconclusive as to whether the delayed washing *caused* the plaintiff to contract dermatitis. Through Lord Wilberforce, the House of Lords held that if the plaintiff establishes that the defendant's negligence 'materially increased the risk' of an injury, and that injury was sustained, then the burden shifts to the defendant to disprove causation[26]. He added: "to bridge the evidential gap [regarding causation] by inference seems to me something of a fiction, since it was precisely this inference which the medical expert declined to make."[27]

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[25] *McGhee v National Coal Board* [1972] 3 All ER 1008 (HL) [*McGhee*].
[26] *Ibid* at 1012-1013.
[27] *Ibid* at 1013.

The *McGhee* decision was considered by the Supreme Court of Canada in *Snell v Farrell,*[28] where the Supreme Court contemplated the impact of scientific/medical uncertainty on legal fact-finding. The plaintiff in *Snell* had undergone a cataract surgery. During the surgery, it became known that the anesthetic had caused some bleeding behind the plaintiff's eye. Nonetheless, the surgeon continued the surgery, and this was found to be negligent. Some time later, the patient lost sight in the eye that had bled. However, the medical experts were not able to provide conclusive evidence that the surgeon's negligent continuation of the cataract surgery caused the plaintiff's blindness.

The courts below found in favour of the plaintiff, adopting the reasoning of *McGhee*, holding that since the surgeon's negligence increased the risk of the plaintiff's injury, it was up to the surgeon to show that his negligent act did *not* cause the injury. Judgment was given in favour of the plaintiff.[29] The Supreme Court found in favour of the plaintiff as well, but not on the basis of the *McGhee* 'material increase in risk' and onus-reversal approach. Rather, the Supreme Court unanimously concluded that the traditional principles of legal fact-finding were adequate to the task of assessing liability in such cases. The Supreme Court's analysis provided some telling remarks that implied the legitimacy of adjudicative decision-making despite circumstances of medical uncertainty.

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[28] *Snell v Farrell* (1990), 72 DLR (4th) 289, SCJ No 73 (QL) [*Snell*].
[29] The *Snell* decision was an appeal from the New Brunswick Court of Appeal ((1988), 84 N.B.R. (2d) 401, 214A.P.R. 401), which upheld the judgment of the Court of Queen's Bench ((1986), 77 N.B.R. (2d) 222, 195 A.P.R. 222, 40 C.C.L.T. 298), finding the defendant liable in negligence for the plaintiff's loss of vision in her right eye.

The Supreme Court rejected the onus reversal in Lord Wilberforce's speech in *McGhee*. Instead, the *Snell* decision adopted the interpretation of *McGhee* contained in *Wilsher v Essex Area Health Authority.*[30] In that case, *McGhee* was interpreted to affirm the "principle that the onus of proving causation lies on the pursuer or plaintiff."[31] Moreover, in *Wilsher*, *McGhee* was held to call for a "robust and pragmatic approach to the facts to enable an inference of causation to be drawn even though medical and scientific expertise cannot arrive at a definitive conclusion."[32] By adopting this interpretation of *McGhee*, the Supreme Court affirmed the traditional principle that the plaintiff bears the burden of proof to establish the requisite elements of a tort, and reminded triers of fact that they are entitled to apply a 'robust and pragmatic approach' to finding legal facts, which would allow causation to be established in law, whether or not causation could be established scientifically.

While Canadian commentary on *Snell* has been mixed,[33] in my reading, the Supreme Court's judgment in *Snell* constitutes an endorsement of the familiar procedures of

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[30] *Wilsher v Essex Area Health Authority* [1988] 2 WLR 557 [*Wilsher*].
[31] *Snell*, *supra* note 28 at 22.
[32] *Ibid* at paras 22 and 33.
[33] For instance, Klar has suggested that by allowing inferences of causation to be drawn in the absence of scientific evidence suggestive of probable causal link between the negligence and the injury functions as an acceptance of the onus reversal advocated by Wilberforce J in *McGhee*. See Klar, *Tort Law*, *supra* note 21 at 402-403; On the other hand, Brown has endorsed the *Snell* insight that cause-in-fact may be inferred without scientific corroboration. He offers the provocative suggestion that "no [evidence of causation] exists in the sense of showing that X happened, and then X led to Y. All we can know is that X preceded Y. There is never evidence *of* cause-in-fact." See Russell Brown, "Known Unknowns in Cause-In-Fact" (2011) 39 Advocates' Q 37 at 54 [Brown, Known Unknowns]. The same argument is

legal fact-finding, and the legitimacy thereof - even in the face of evidentiary uncertainty, including scientific uncertainty. This is consistent with Bryant et al's explanation of *Snell* as well: "In *Snell v Farrell*, the Supreme Court of Canada reaffirmed that the plaintiff had the persuasive burden for establishing on a balance of probabilities that the defendant caused or contributed to the injury."[34] Thereby, while the court recognized the evidential difficulties that could arise due to scientific and medical uncertainty in personal injury litigation, it also affirmed the legitimacy that is provided by proper application of the principles of legal fact-finding, including the plaintiff bearing the onus of proof, along with a proper understanding of the standard of legal proof, which does not equate with scientific proof.

The following noteworthy paragraphs contain the Court's explanation of legal fact-finding, including an explanation of the onus of proof. Taken together, these paragraphs imply that legal fact-finding is a legitimate exercise though it does not contain scientific precision:

> Whether an inference [of causation] is or is not drawn is a matter of weighing evidence. The defendant runs the risk of an adverse inference in the absence of evidence to the contrary. This is sometimes referred to as imposing on the defendant a provisional or tactical burden. In my opinion, this is not a true burden of proof, and use of an additional label to describe what is an ordinary step in the fact-finding process is unwarranted.
>
> The legal or ultimate burden remains with the plaintiff, but in the absence of evidence to the contrary adduced by the defendant, an inference of causation may be drawn although positive or scientific proof of causation has not been

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explained more elaborately in Russell Brown, "The Possibility of "Inference Causation": Inferring Cause-in-Fact and the Nature of Legal Fact-Finding" (2010) 55 McGill LJ 1.

[34] Bryant et al, *Evidence*, *supra* note 9 at 126.

> adduced…This is, I believe, what Lord Bridge had in mind in *Wilsher* when he referred to a "robust and pragmatic approach to the … facts."[35]

These comments suggest that the normal process of legal fact-finding, where all the evidence, taken together, is weighed to determine whether the standard of proof is established (described as a 'robust and pragmatic' approach to fact-finding) is a legitimate decision-making process; it does not need to be backed by conclusive science. In other words, causation can legitimately be found as a legal fact even if science is inconclusive about the cause of the plaintiff's injury. Thus, the Supreme Court of Canada implies the legitimacy of decisions made through appropriate legal fact-finding, despite evidential uncertainty, which could lead to substantive inaccuracy.

This implication is even more self-evident through the Court's interpretation of the perceived injustice that scientific or medical uncertainty causes to injured plaintiffs, a perception which generated the argument that modification of the traditional approach to proof of causation may be warranted. In its interpretation, the Supreme Court did not consider the perceived injustice to be an actual injustice: "I am of the opinion that the dissatisfaction with the traditional approach to causation stems to a large extent from its too rigid application by the courts in many cases. Causation need not be determined with scientific precision."[36] By defining the problem in this way, the Supreme Court asserts that it is erroneous to impose

[35] *Snell, supra* note 28 at 32-33, references removed.
[36] *Snell, supra* note 28 at 29.

scientific standards of proof on legal fact-finding, as such an approach would over-value scientific inquiry and under-appreciate the legitimacy of legal fact-finding. The Supreme Court's framing of the issue demonstrates how over-deference to science can be prejudicial and can distort the fact-finding process.[37] An over-reliance on scientific endorsement for the purpose of finding legal facts, accompanied with an under appreciation of the legitimacy of legal fact-finding via proper application of the standard of proof, may have improperly resulted in plaintiffs being left uncompensated. This is because requiring conclusive scientific proof in order to establish causation in law is flawed. It is wrong because it manipulates the process of legal fact-finding by imposing a scientific standard of proof, which is not the legal standard of proof. Legitimate legal facts are those that are found on the basis of all the presented evidence, as measured up to the applicable standard of proof – the balance of probabilities. This is why seeking to establish legal facts on the basis of scientific certainty is an improper exercise, which displays an erroneous over-reliance on science.

The Supreme Court's decision in *Snell* affirms the impropriety of over-reliance on scientific evidence. The decision is clear that even if legal determinations cannot be backed by science, the legal finding of fact is nonetheless legitimate when the standard of proof is appropriately understood and applied. That is, if, based on all the evidence presented at trial, including the available scientific evidence, the trier

[37] Recall Sopinka J's caution in *R v Mohan* [1994] 2 SCR 9, SCJ No 36 (QL) regarding the distorting effects of over-reliance on scientific evidence. See my discussion in Chapter 1, *Setting the Science and Law Stage*, Part 2(b).

of fact is led to the conclusion that the defendant's negligence more likely than not caused the injury, then causation is established at law. If the available evidence cannot establish causation on the balance of probabilities, then indeed the plaintiff's action must fail. In this way, the Supreme Court's analysis in *Snell* is consistent with my project to demonstrate that over-reliance on science may compromise the legitimacy of adjudicative outcomes by causing procedural impropriety.

Post *Snell*, the Supreme Court of Canada had additional opportunities to consider the substantive test for causation in personal injury litigation. In *Athey v Leonati,*[38] the Court addressed the issue of causation where tortious and non-tortious causes contributed to the plaintiff's injury. There, the Supreme Court reaffirmed the 'but for' test for causation, and also introduced the "material contribution" test for causation into Canadian law.[39] This led to some ambiguity over the substantive test to establish causation. Just under a decade later, in *Resurfice Corp v Hanke*,[40] the Supreme Court re-confirmed that the substantive test for causation is the familiar 'but for' test and also that the 'material contribution' test is available, though in limited circumstances.[41] "The 'material contribution' test," the Court held, "only applies in exceptional cases where factors outside of the plaintiff's control make it impossible for the plaintiff to prove that the defendant's negligence caused the

[38] *Athey v Leonati* [1996] 3 SCR 458, 3 SCJ no 102 (QL) [*Athey*]
[39] *Athey, ibid* at 41: "The applicable principles can be summarized as follows: If the injuries sustained in the motor vehicle accidents caused or contributed to the [injury], then the defendants are fully liable for the damages flowing from the [injury]. The plaintiff must prove causation by meeting the 'but for' or material contribution test."
[40] *Resurfice Corp v Hanke* [2007] 1 SCR 333, SCJ no 7 (QL) [*Resurfice*].
[41] *Ibid* at paras 21 and 22.

plaintiff's injury using the 'but for' test, and the plaintiff's injury falls within the ambit of risk created by the defendant's breach of his duty of care owed to the plaintiff."[42]

The authorization of the material contribution test in *Resurfice* led some commentators to assert that the Supreme Court had effectively done away with the 'but for' test. For instance, Brown argues that although the Court in *Resurfice* affirmed the 'but for' test as the primary causation analysis, it is "difficult to take that claim seriously when it is paired with a test that applies in conceivably every situation where, because of scientific or other evidentiary uncertainty, the but-for test does not work to a plaintiff's benefit, and which is satisfied, by definition, whenever negligence is proven."[43] Brown's conclusion is understandable because the Court in *Resurfice* makes reference to limitations of scientific knowledge, and suggests a connection between scientific uncertainty, the impossibility of establishing the 'but for' test, and the availability of the less onerous 'material contribution' test.[44]

If the material contribution test were available whenever the evidence was insufficient to establish the 'but for' test on a balance of probabilities, as Brown claims , then my purpose of demonstrating the Supreme Court's commitment to

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[42] *Resurfice, supra* note 40 at headnote. See also paras 17, 21, 23-25, 29.
[43] Russell Brown, "Material Contribution's Expanding Hegemony: Factual Causation After Hanke v. Resurfice Corp." (2007) 45 Can Bus LJ 432 at 456 [Brown, Hegemony].
[44] *Resurfice*, *supra n*ote 40 at para 25.

established principles of legal fact-finding, even in the face of scientific or medical uncertainty, could be somewhat compromised. However, the latest word from the Supreme Court in *Clements v Clements*[45] pronounces a different interpretation of the causation analysis provided in *Resurfice*, which affirms its commitment to the established 'but for' test, as well as its commitment to the principles of legal fact-finding to the requisite standard of proof despite scientific uncertainty.

In *Clements*, the Court concedes that its discussion of the availability of the material contribution test in *Resurfice* was incomplete.[46] A large part of the ambiguity after *Resurfice* arose because the material contribution test was supposed to be available when the 'but for' test was impossible for the plaintiff to establish. However what was meant by 'impossible for the plaintiff to establish' remained uncertain.[47] The Court took the opportunity in *Clements* to discuss what "impossible" meant to clarify the availability of the material contribution test.

To clarify what 'impossible' meant, the Court started by opining on what 'impossible' *cannot* mean. The opinion confirms that the material contribution test is not available simply in any circumstance where proof of the 'but for' test for causation cannot be made out due to evidentiary difficulty.[48] If that were so, then in any action where factual causation was difficult to prove, a plaintiff could claim that the material contribution test should be available. This result, the Supreme Court confirms, "would fundamentally change the law of negligence and sever it from its

[45] *Clements v Clements* 2012 SCC 32 (unreported) [*Clements*].
[46] *Ibid* at para 34.
[47] *Ibid* at paras 34, 35.
[48] *Ibid* at para 37.

anchor in corrective justice that makes the defendant liable for the consequences, but only the consequences, of his negligent act."[49] Thus, the interpretation that the 'material contribution' test is available whenever there are evidentiary uncertainties that make proof of 'but for' causation impossible was rejected by the Supreme Court.

The Court expressly confirmed that scientific uncertainty is simply a variant of factual uncertainty; scientific uncertainty is not itself a justifiable reason to depart from ordinary principles of negligence law and proof of legal facts. Affirming the discussion in *Snell*, the Supreme Court in *Clements* explained that "the law of negligence has never required proof of scientific causation; to repeat yet again, common sense inferences from the facts may suffice. If scientific evidence of causation is not required, as *Snell* makes plain, it is difficult to see how its absence can be raised as a basis for ousting the usual 'but for' test."[50] Thus the trial judge's insistence on scientific proof to establish causation under the 'but for' test was found to be in error.[51]

The Court then concluded that impossibility of proof under the 'but for' test, as a pre-requisite to applying the material contribution test, refers to situations of multiple tort-feasors, where all have acted negligently, and the negligence of one or more has factually caused the plaintiff's injury. The Court describes such a situation as one in which the plaintiff would not have suffered an injury 'but for' the

[49] *Ibid* at 37.
[50] *Ibid* at para 38.
[51] *Ibid* at paras 48-49.

negligence of the tort-feasors, viewed globally.[52] Thus, the 'but for' test remains applicable in the sense that 'but for' the negligence of any or all of the tortfeasors, the plaintiff would not have been injured. However, because the negligent tortfeasors can all point an accusing finger at one another, it would be impossible for the plaintiff to establish which negligent tortfeasor caused his injury, on the balance of probabilities. This, the Supreme Court advises, is the 'impossibility of proof' that triggers the applicability of the material contribution test. In these circumstances, where the plaintiff can prove that a defendant materially contributed to the risk of injury, then that defendant may be found liable.[53]

By concluding this way, the Court first re-affirms the principle that the traditional 'but for' causal link between an act of negligence and the injury must be established on the balance of probabilities for the plaintiff's injury to be compensable. This is true even in the situation of multiple tort-feasors, which then triggers the availability of the material contribution test to determine the liabilities of the individual tort-feasors. Importantly for my project, the Court in *Clements* also confirmed that whether or not there is scientific uncertainty surrounding the causal relationship, the 'but for' test remains applicable, and does not impact the propriety of legal fact-finding. Affirming its earlier decision in *Snell*, the Supreme Court again implicitly affirmed that scientific uncertainty does not impact the legitimacy of proper legal fact-finding and the legal decisions made on the basis of legal facts.

[52] *Ibid* at para 39.
[53] *Ibid* at para 40.

The availability of the material contribution test leaves one consideration outstanding: it may be suggested that the cases that approve the material contribution test, culminating in the *Clements* decision, effectively endorse a relaxation of standard of proof required to establish causation for individual tort-feasors who acted negligently along with others. This interpretation might imply that the Courts have, in fact, endorsed an alteration to the procedures of legal fact-finding by allowing a manipulation of the standard of proof required to establish factual causation. I do not, however, read the Court's decision in *Clements* as allowing for any change in the procedures of legal fact-finding, including the standards of proof required to establish the relevant legal facts. The availability of the 'material contribution' test does not alter the procedural principles of legal fact-finding. Where the 'material contribution' test is available, a plaintiff would have to establish, *on a balance of probabilities*, that the tortfeasor's negligence materially increased the risk of the injury sustained. This inquiry occurs after the plaintiff establishes on the balance of probabilities that 'but for' the negligence of any or all of the negligent tort-feasors, the injury would not have occurred.

Thus, while the substantive requirement of what legal facts must be proven for a finding of liability to be made may shift, there is no endorsement of any procedural change vis-à-vis the nature of legal fact-finding. The procedure to determine whether the substantive elements of the law have been satisfied or not is resistant to change. Rather than endorsing any procedural change, the Supreme Court of Canada confirms that the plaintiff bears the burden to prove, on a balance of

probabilities, the causal link between negligence and injury globally, as well as a link between the individual tort-feasor's negligence and the plaintiff's injury, and scientific or other evidentiary uncertainty is not a justifiable reason to depart from principled legal fact-finding.

Snell, *Athey, Resurfice* and *Clements*, taken together, indicate that however the substantive law defines the requisite legal facts, the plaintiff has the onus of establishing these facts to the relevant standard of proof. The cases have been firm in requiring consistent application of these principles, even in the face of scientific and medical uncertainty, and despite perceptions of unfairness arising out of such uncertainty. This represents a clear endorsement of the concept that despite the conditions of uncertainty and the associated risk of substantive inaccuracy, the adjudicative process and the outcomes it produces, maintains legitimacy through consistent adherence to its own procedures. This is not to suggest that the substantive elements of laws and factual accuracy lack significance, but to affirm that procedural integrity must not be given second place.

In the next section, I provide further illustrations of the judicial commitment to consistency in principle and process, arising through invitations to adopt the 'loss of chance' doctrine.

2(b). Judicial Treatment of 'Loss of Chance' - Lafferiere, Gregg v Scott

From time to time, difficulties in proof of causation due to medical uncertainty have prompted the argument that a 'loss of chance' doctrine should be incorporated into

medical negligence law. The causation difficulty that provokes the loss of chance argument can be best explained through a hypothetical example. Suppose a doctor negligently fails to inform a patient of some medical condition, delaying the patient's treatment. Once the plaintiff's condition is appropriately diagnosed, it becomes clear that her prognosis is poor, and she sues the doctor in negligence. Eventually, the plaintiff dies of the medical condition.

In order to be successful in the claim, the plaintiff will have to prove that 'but for' the doctor's negligence, the adverse outcome (in the example above, the plaintiff's death) would not have occurred. Medical evidence is likely to be inconclusive regarding the causal connection between the doctor's negligence and the patient's eventual death, because any number of potential causes, including the natural course of the plaintiff's illness, could be said to have caused the ultimate outcome. This medical uncertainty is especially significant for proving causation in law, where the chance of survival prior to any negligent act was less than 50%. In that situation, it would not be possible for the plaintiff to establish that 'but for' the doctor's negligence, on a balance of probabilities, the plaintiff would have survived, because even absent any act of negligence, the adverse outcome was already more likely to occur than not. Consequently, it would be impossible to establish causation in law. Given these circumstances, it has been suggested that rather than requiring the plaintiff to prove that the negligence caused the adverse outcome, she should be permitted to prove that the negligence reduced her *chances* of a better outcome, and that reduction in chance should be compensated. To the extent that the chance of a

better outcome was reduced, the negligent doctor would be liable. This is the essence of the loss of chance doctrine.[54]

The Supreme Court has addressed, and rejected, the proposal to introduce a loss of chance doctrine into Canadian medical negligence law in *Lafferiere v Lawson.*[55] The House of Lords commented similarly on the loss of chance argument in *Gregg v Scott.*[56] In both cases, the loss of chance argument was rejected on the basis that it is contrary to the established principles of tort law, including the requirement to prove, on a balance of probabilities, that an act of negligence caused an injury to the plaintiff. Below, I provide commentaries from both cases that illustrate the judicial commitment to legal principles and procedures for determining causation, despite medical uncertainty.

2(b)(i). Supreme Court of Canada - Lafferiere v Lawson

In *Lafferiere*, the plaintiff commenced an action in negligence against her doctor for negligently failing to inform her of her cancerous condition. The plaintiff died of generalized cancer prior to the completion of the legal proceedings. She argued that though it was impossible to prove, on a balance of probabilities, that the plaintiff's

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[54] Although a rich debate exists surrounding the loss of the chance doctrine, my purpose is not to engage substantively in this debate. Rather, I use judicial reactions to the loss of chance proposal in the medical negligence context to illustrate the courts' commitment to the principles and procedures of legal fact-finding. I suggest that the judicial reactions that I present are supportive of my thesis that procedural consistency is integral to maintaining legitimate adjudicative outcomes. For an introduction to the 'loss of chance debate', see Picard & Robertson, *Legal Liability of Doctors and Hospitals in Canada*, *supra* note 22 from pg 288; Lara Khoury, *Uncertain Causation in Medical Liability (*Portland: Hart Publishing, 2006), Chapter 4: Probabilistic Assessment of Damages.

[55] *Lafferiere v Lawson* [1991] 1 SCR 541, SCJ no 18 (QL) [*Lafferiere*].

[56] *Gregg v Scott*, [2005] 2 AC 176 (House of Lords) [*Gregg v Scott*].

ultimate fate would have been any different absent the doctor's negligence, it could be established that the doctor's negligence decreased her *chance* of a more positive outcome. That reduction in chance, the plaintiff suggested, ought to be compensable. Thus, the Supreme Court in *Lafferiere* was asked to consider the loss of chance doctrine and determine whether to introduce it into Quebec civil law regarding medical responsibility.[57]

Gonthier J, writing for the majority, provided a useful analysis of the loss of chance doctrine, which culminated in the Supreme Court's refusal to apply it. The majority's reasons provided a review of the literature published in France and Belgium on the issue.[58] This review disclosed two characterizations of the loss of chance doctrine. In one characterization, loss of chance is considered an injury or a type of damage that can itself be compensated. A contrary interpretation is that the true effect of incorporating the loss of chance doctrine into medical negligence actions is to "undermine causality as an essential element of civil liability, and it is therefore to be rejected as contrary to established principle."[59]

Considering whether the loss of chance should be conceived of as a type of damage that can sustain a cause of action, the Court acknowledged that there are some exceptional situations where the loss or damage suffered can only be understood in terms of probabilities. For instance, where a lottery ticket is not placed in a draw as

[57] *Lafferiere, supra* note 55 at para 1.
[58] See *Lafferiere, ibid* at paras 55-101 for a more detailed review of the French and Belgian literature on the loss of chance doctrine and the competing interpretations.
[59] *Ibid* at 46.

a result of the negligence of the vendor, the "judge has no factual context in which to evaluate the likely result other than the realm of pure statistical chance."[60] In such conditions, the loss of a chance can itself be considered the damage suffered. However:

> To transform this exceptional case into the theoretical basis for recovery in all loss of chance situations would be unnecessarily abstract, and, more importantly for the case before us, would give the mistaken impression that the court is more interested in the certainty of statistical chances than in the probable results which those chances represent.[61]

The Supreme Court rejected the proposal that the loss of a chance of a more favorable medical outcome should be considered a compensable damage. Most importantly, the Supreme Court demonstrated its commitment to maintaining the principles of legal fact-finding. It is implicit in Gonthier J's comments above that legal facts are found on the basis of likelihoods, which makes statistical evidence at times relevant to the fact-finding process. However, once the requisite level of likelihood to establish a legal fact is met, the *chance* of that event is no longer relevant. In other words, although the legal fact is found on the basis of a legally established standard of likelihood (i.e. the standard of proof), once established, that fact is taken to be a legal certainty so that the substantive law can be applied. This is what allows Gonthier J to state that it is the "probable result which the chances represent" that is the ultimate interest of the Court, even though these results or outcomes are only 'probable.' That is, despite being based on likelihoods, the results that those likelihoods represent are the legal facts upon which adjudicative

[60] *Ibid* at 148.
[61] *Ibid* at 148.

decisions are based. Maintaining the principle of legal fact-finding, that once a fact is established to the requisite standard of proof, it becomes a legal certainty, Gonthier J confirms that for there to be liability in tort, the negligence must be causally connected to the adverse outcome itself, established on a balance of probabilities. A causal connection only to the chance of an adverse outcome would not suffice.

Affirming that the chance of a better outcome cannot be the compensable injury attracting liability, the Court reiterated that a causal connection between the adverse outcome (i.e. the plaintiff's death) and the doctor's negligence must be established for liability to follow. It concluded that "the loss of chance analysis recommended by the respondent is inappropriate, at least in cases where death or sickness has already occurred. In such cases, classical principles of causation suffice, and, further, are essential in order for individual responsibility to attach."[62]

In arriving at this conclusion, Gonthier J acknowledges the difficulty that is often associated with establishing causation in the medical negligence context, where there is scientific or medical uncertainty surrounding the cause of the plaintiff's situation. Echoing the treatment of this difficulty in *Snell v Farrell*, Gonthier J reiterates the Court's commitment to the established principles of legal fact-finding via the balance of probabilities standard, despite scientific/medical evidentiary uncertainty:

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[62] *Ibid* at 45.

> It is perhaps worthwhile to repeat that a judge will be influenced by expert scientific opinions which are expressed in terms of statistical probabilities or test samplings, but he or she is not bound by such evidence. Scientific findings are not identical to legal findings. Recently, in *Snell v Farrell*, this Court made clear that "Causation need not be determined by scientific precision" and that "it is not…essential that the medical experts provide a firm opinion supporting the plaintiff's theory of causation." Both this Court and the Quebec Court of Appeal have frequently stated that proof as to the causal link must be established on the balance of probabilities taking into account all the evidence which is before it, factual, statistical and that which the judge is entitled to presume."[63]

Unsurprisingly the Supreme Court held that if the trial judge was not satisfied, on the balance of probabilities, that 'but for' the doctor's negligence, the plaintiff would not have suffered any actual damage (as opposed to only the chance of damage), then recovery must be denied, thus rejecting the applicability of the loss of chance doctrine for establishing liability in the medical negligence context. "[T]o do otherwise," Gonthier J advises, "would be to subject doctors to an exceptional regime of civil responsibility."[64]

Through the rejection of the loss of chance doctrine on the basis that it would improperly alter the established principles of proof of causation, the Court again demonstrates its reluctance to manipulate legal procedures of proof, despite recognition of the difficulty associated with evidentiary uncertainty. The decision provides a powerful reminder that medical or scientific uncertainty is not a justifiable reason to subject a particular class of litigants (i.e. doctors) to different rules and principles of legal proof. The reasoning is consistent with my thesis that

[63] *Ibid* at 156.
[64] *Ibid* at 159.

the process of legal reasoning is legitimate, despite the conditions of evidentiary uncertainty in which it takes place. Further, this case confirms that scientific/medical uncertainty does not compromise the legitimacy of arriving at final adjudicative outcomes, but failing to consistently apply legal procedures in the name of scientific or medical uncertainty can.

The *Lafferiere* case is the Supreme Court of Canada's only pronouncement on the loss of chance doctrine, but the House of Lords was asked to consider the loss of chance doctrine in similar circumstances in *Gregg v Scott*. The majority of the Lords in *Gregg v Scott* adopt similar reasoning to the Supreme Court in *Lafferiere* in rejecting the applicability of the loss of chance doctrine. Below, I highlight the Lords' commentaries, drawing attention to instances where the commitment to compliance with legal principles and procedures is manifest.

2(b)(ii). House of Lords – Gregg v Scott

In *Gregg v Scott*[65] the House of Lords was faced with facts very similar to *Lafferiere*. A claim was brought against Dr. Scott, who had acted negligently in failing to diagnose a malignant lump that afflicted his patient. The failure to diagnose led to a nine-month delay in the patient receiving treatment. During this nine-month period, the cancer spread. The plaintiff claimed that the doctor's negligence, leading to the delay in treatment, prevented him from being cured of his disease, or at least reduced his chances of being cured. Thus, the House of Lords were invited to introduce the loss of chance doctrine into British medical negligence law.

[65] *Gregg v Scott* [2005] UKHL 2 [*Gregg v Scott*].

The evidence presented at trial indicated that the plaintiff's chance of survival was 42%, prior to any act of negligence. These prospects were reduced to 25% by the time of the trial.[66] Given this evidence, the trial judge found that he could not conclude that, on a balance of probabilities, if it were not for the doctor's negligence, the plaintiff would not have been deprived of a cure, because the plaintiff's chances of survival prior to the doctor's negligence were already less than 50%.[67] The plaintiff appealed the trial judge's decision, and the House of Lords considered his argument that rather than requiring proof that the delay in treatment caused the detrimental outcome itself (i.e. being prevented from being cured at all), the reduction in the *chance* of being cured should be compensated. If this were an acceptable analysis, then the causal link to be established would be between the doctor's negligence and the reduction in the chance of recovery, rather than the doctor's negligence and the actual adverse outcome.

Like the Supreme Court of Canada in *Laferriere*, the majority of the House of Lords rejected the invitation to apply the loss of chance doctrine and dismissed the appeal. The reasons of the Lords, including the concurring judgments, varied from one another, but they consistently contain a commitment to maintaining the established legal principle of requiring proof, on a balance of probabilities, of a causal link between the act of negligence, and some actual damage suffered. Indeed, the majority of the House of Lords maintains, even where medical uncertainty makes

[66] *Ibid* at para 5.
[67] *Ibid* at para 6.

that a difficult task, the legal process must be applied consistently in order to maintain the integrity of the adjudicative process. The purpose of my discussion below is to demonstrate this commitment, rather than endorse the substantive reasons of one judge over another. With this purpose in mind, I provide some key points from the Lords' decisions below.

Along with the facts set out above, the *Gregg v Scott* case contains a happy twist: beating the odds, the plaintiff remained alive at the time of the trial, so the most significant adverse outcome that might be linked to the doctor's negligence had not actually manifested. The Lords placed differing emphases on this circumstance in their analyses. It seemed to bear a particular significance in Baroness Hale's decision, which rejected the loss of chance doctrine, pointing to the well-established principle of tort law that for liability to attach, the negligence must be shown to have caused some actual damage to the plaintiff.[68]

Displaying a similar sentiment as Gonthier J in *Laferriere*, Baroness Hale's speech asserted that the existence of some injury or damage is the 'gist' of tort law.[69] The adoption of a new principle recognizing a loss of a chance as itself a sustainable

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[68] I discuss this aspect Baroness Hale's reasoning further in my upcoming discussion, but see generally her reasoning at *Gregg v Scott*, *ibid* at paras 192-227. Wienrib provides a statement of the principle in Canadian law: "Injury is essential to liability for negligence; no matter how culpable the defendant's act, the defendant cannot be held liable for negligence unless the defendant's act resulted in an injury to the plaintiff. Thus, without the materialization of the risk into injury, no liability can arise." Ernest Weinrib, *Tort Law: Cases and Materials*, 3ed (Toronto: Montgomery Publications Limited, 2009) at 223 [Weinrib, *Tort Law*].

[69] *Gregg v Scott, supra* note 65 at 217.

cause of action, and awarding compensation to the extent of the reduction in chance, was rejected in the face of the contrary established principle of law that the defendant must cause the plaintiff some actual harm for the defendant to be liable.[70] Baroness Hale explains the large-scale impact of incorporating the loss of chance doctrine into tort law as follows:

> The wide version of the argument would allow recovery for any reduction in the chance of a better physical outcome, or any increase in the chance of an adverse physical outcome, even if this cannot be linked to any physiological changes caused by the defendant. A defendant who has negligently increased the risk that the claimant will suffer harm in the future…would be liable even though no harm had yet been suffered. This would be difficult to reconcile with our once and for all approach to establishing liability and assessing damage. [71]

Preferring the conventional approach over the loss of chance doctrine, Baroness Hale reiterates the traditional process of establishing liability in tort: "The primary facts of what took place must be proven on the balance of probabilities. It must also be shown on the balance of probabilities that what the defendant negligently did or failed to do caused the claimant's damage." [72] She asserts that the doctor's negligence must be causally related to the adverse event itself (meaning a deprivation of a cure in this case), and not the reduction in the *chance* of the adverse outcome. If the causal connection between the negligence and the adverse event itself could be established to the requisite standard of proof, then in accordance with the 'once and for all' nature of legal fact-finding, causation would be taken as a legal certainty, and the defendant would be liable to the plaintiff in full. Under this traditional approach, Baroness Hale suggests that the conventional damages that

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[70] *Ibid*.
[71] *Ibid* at 212.
[72] *Ibid* at 194.

the plaintiff claimed, including pain, suffering and loss of amenity; loss of earnings and cost of care; loss of expectation of life, "[a]ll of this would have been payable had he succeeded in proving on the balance of probabilities that 'but for' the defendant's failure…he would have been 'cured.'"[73]

Clearly then, Baroness Hale was unwilling to compromise the traditional approach to proving the underlying facts on a balance of probabilities, and the 'all-or-nothing' consequence of finding legal facts – established on the balance of probabilities, legal facts are taken as certainties, and liability is established on the basis of those facts. Once liability is established, the plaintiff is legally entitled to full compensation. I discuss this further in the next chapter. In short, Baroness Hale's point is that despite medical uncertainty, which makes proof of causation of an actual adverse event difficult in the medical negligence context, the traditional principles of legal fact-finding must be adhered to. Clearly, this suggests the importance of procedural consistency. Rejecting the loss of chance argument, and instead applying these traditional principles to the plaintiff's claim, Baroness Hale concludes that although the plaintiff faced a risk of a serious outcome, which happily had not yet materialized, attempting to introduce liability for loss of a chance in personal injury claims should not be done.[74]

Lord Hope's minority decision, although arriving at a different ultimate conclusion than Baroness Hale, displayed a similar reluctance to depart from ordinary

[73] *Ibid* 194.
[74] *Ibid* at para 266.

principles of tort law and proof of legal facts. He concluded in favour of the plaintiff, but he did not do so on the basis of the loss of chance doctrine.[75] Rather, according to Lord Hope, it is not necessary to depart from established principles in this case at all, by characterizing the claim in a way that would not require resort to the loss of chance doctrine.[76] Rather than basing the claim on the loss of the chance of being cured, Lord Hope maintains that the damage that forms the basis of the claim is the enlargement of the plaintiff's malignant tumor which occurred during the nine month delay.[77] The evidence presented at trial indicated that the tumor was enlarged due to the delay in treatment, which was caused by the doctor's negligent failure to diagnose the plaintiff's condition. Because the evidence at trial was sufficient to establish the causal connection between the doctor's negligence and the enlargement of the tumor on the balance of probabilities[78], Lord Hope held that the plaintiff had established liability.[79]

Interpreting the claim this way, Lord Hope was able to avoid first, the issue that the plaintiff could not show that the doctor's negligence caused him some actual physical damage, and, second, the issue that 'but for' the doctor's negligence, he would not have been denied a cure. In other words, Lord Hope interpreted the claim in a way that allowed him to stay within the normal principles of tort law, and proof of the underlying facts required to establish liability. While my purpose is not

[75] *Ibid*, Lord Hope's reasons at 92-124.
[76] *Ibid* at para 98.
[77] *Ibid* at 98, 108, 117, 118, 123.
[78] *Ibid* at 5: "Prompt treatment would, at least initially, have prevented the cancer spreading to the left pectoral region."
[79] *Ibid* at para 117.

to comment on the propriety of Lord Hope's approach, I suggest that the basis of his conclusion serves to emphasize the importance that he too places on adherence to legal principles and procedure.

My interpretation of Lord Hope's position is consistent with Lord Phillips' understanding of it as well. As Lord Phillips explains: "as I understand Lord Hope of Craighead, he would hold the normal rule [of proof of causation] applicable in the present case. His analysis is that, on balance of probabilities, Dr. Scott's negligence caused the enlargement of Mr. Gregg's cancer with consequent pain and suffering and that Mr. Gregg is entitled to general damages for this head of damages in full."[80] Although he agrees that Lord Hope's analysis does not require a departure from current legal principles,[81] Lord Phillips' arrives at a different conclusion from Lord Hope.

Lord Philips chose not to alter the characterization of the plaintiff's claim. Initially, Lord Phillips reminds, the plaintiff's claim was advanced "as a conventional claim for having been deprived of an early and complete cure."[82] Later, medical evidence revealed that the plaintiff suffered from a rare type of cancer, which resulted in a poor prognosis whether or not the doctor had treated him negligently. This information prompted the plaintiff to advance a claim for damages for the reduction

[80] *Ibid* at 175.
[81] *Ibid* at para 187.
[82] *Ibid* at 129.

of the *chance* of being cured.[83] In his consideration of this argument, Lord Phillips comments that the task of "assessing the loss of a chance in clinical negligence cases is not an easy one."[84] Nonetheless, Lord Phillips acknowledges that difficulty in applying the loss of chance doctrine is not itself enough reason to tolerate injustice, leading him to consider whether the proof difficulties in the medical negligence context do indeed lead to unfairness. Lord Phillips concludes that the application of the current legal principles in the medical negligence context does not amount to an injustice that would justify the change to the law that the loss of chance doctrine would encompass.[85] Rather, he comments, "it seems to be that there is a danger, if special tests of causation are developed piecemeal to deal with perceived injustices in particular factual situations, that the coherence of our common law will be destroyed."[86] Thus, instead of solving an injustice, Lord Phillips implies that the introduction of the loss of chance doctrine may cause one by allowing inconsistency in the application of legal principles.

Reflecting the importance he places on consistently applied legal principles, Lord Phillips comments that allowing the loss of chance argument would fly in the face of established precedent, referring to the earlier decisions, *Hotson*[87] and *Wilsher*[88],

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[83] *Ibid* at 129.
[84] *Ibid* at 170.
[85] *Ibid* at 171.
[86] *Ibid* at 172.
[87] *Hotson v East Berkshire Area Health Authority* [1987] AC 750. In this case, a boy fell out of a tree breaking his hip. The medical treatment he received was negligent in its failure to diagnose the fracture. The boy's hip joint was permanently damaged. However, the permanent damage was more likely caused by the fall itself, rather than by the negligent misdiagnosis, even though a proper diagnosis may have

where the House of Lords had previously confirmed the applicability of traditional causation analysis on the balance of probabilities in the medical negligence context. Moreover, Lord Phillips finds that to hold that those two cases are no longer good law would "have implications for the balance of probability test of causation in other areas of our law. That consideration could better be given by the Law Commission than this House and it certainly has not been given in the present case."[89] In so holding, Lord Phillips confirms that consistent application of principle and procedure is the paramount task that is assigned to courts: consistent and principled adjudicative decision-making; perceived injustices in particular situations are not justifiable reasons to depart from maintaining such consistency. Lord Phillips concludes: "Awarding damages for the reduction of the prospect of a cure, when the long-term result of treatment is still uncertain is not a satisfactory exercise…I would uphold the conventional approach to causation that was applied by Judge Inglis."[90] Under the conventional liability analysis, the plaintiff would have to show that the doctor's negligence was a probable cause of the deprivation of a cure, not the probable cause of the reduction in the chance of a cure. Because the

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increased the chances that the permanent damage would not have occurred by 25%. The House of Lords in that case decided that causation was not made out to the requisite balance of probabilities standard, so recovery was not available.

[88] *Wilsher v Essex Area Health Authority* [1988] AC 1074. Here, a doctor had negligently placed a catheter on the wrong part of a baby. Consequently, the monitor failed to detect that the baby was receiving too much oxygen. Eventually, the baby developed an eye condition causing blindness. This condition could have been caused by an over-supply of oxygen, but may also have been attributable to other unrelated causes. The House of Lords found that if the lack of oxygen cannot be established on the balance of probabilities to have caused or substantially contributed to the injury, liability is not made out, and there is no compensation.

[89] *Gregg v Scott, supra* note 65 at 174.

[90] *Ibid* at 190.

evidence could not support this conclusion, the plaintiff's claim was properly denied.

Like Lord Phillips, Lord Hoffmann too expressly rejects the perceived injustice caused by medical uncertainty regarding the cause of an adverse medical outcome. Lord Hoffmann's decision is clear that where the principles and procedures of proof are adhered to, it cannot be said that denying liability results in injustice. Echoing Lord Phillip's emphasis on coherency and consistency in the law, Lord Hoffmann's speech dismissing the appeal approvingly refers to the following comments of an earlier House of Lords decision:

> To be acceptable the law must be coherent. It must be principled. The basis on which one case, or one type of case, is distinguished from another should be transparent and capable of identification. When a decision departs from principles normally applied, the basis for doing so must be rational and justifiable if the decision is to avoid the reproach that hard cases made bad law." [91]

On this premise, Lord Hoffmann finds that scientific or medical uncertainty is not a justifiable reason to depart from the established principles of legal proof. On that basis, he rejects the argument that the loss of chance doctrine should have at least a limited applicability in medical negligence law, because proof of causation in that context is often accompanied by scientific or medical uncertainty.[92] Whether the evidentiary uncertainty is born of scientific or medical ambiguities, Lord Hoffmann comments, does not alter the applicability of the relevant legal principles,

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[91] *Fairchild v Glenhaven Funeral Services Ltd* [2003] 1 AC 32, cited in *Gregg v Scott*, *ibid* at 89.
[92] *Gregg v Scott*, *supra* note 65 at 88.

particularly the principle of finding the necessary legal facts on the basis of the relevant standard of proof:

> The fact that proof is rendered difficult or impossible because no examination was made at the time, as in *Hotson,* or because medical science cannot provide the answer, as in *Wisher,* makes no difference…What we lack is knowledge and the law deals with lack of knowledge by the concept of the burden of proof.[93]

In this statement, Lord Hoffman succinctly states what I sought to illustrate in Part 1 of this chapter: legal determinations are made in conditions of uncertainty due to lack of knowledge. This lack of knowledge was described in Part 1 as 'evidentiary gaps.' These knowledge gaps are dealt with through the burden of proof, which allows legal facts to be found, even in conditions of uncertainty. By holding that despite uncertainty, including scientific and medical uncertainty, it is unprincipled to manipulate the process of proving the requisite legal facts to establish liability, Lord Hoffmann implicitly endorses the significance of procedural legitimacy. Understanding the loss of chance argument as a method of avoiding the requirement to establish causation to the requisite balance of probabilities standard, Lord Hoffmann rejects its applicability.

2(c). Summing Up the Judicial Commentaries

All the cases discussed above demonstrate the significance of adherence to procedure in maintaining legitimate adjudicative decision. They do this by their by the unwillingness to foster any changes to the procedures of legal fact-finding by rejecting the loss of chance argument (*Gregg v Scott*, *Lafferiere*), rejecting a shift in the onus of proof (*Snell*), and through the frequent assertions that scientific

[93] *Ibid* at 79.

affirmation is not a precondition to finding legitimate legal facts (*Snell*, *Lafferiere*, *Clemments*). Through these decisions, the courts sanction the procedural legitimacy argument: fact-finding occurs in conditions of uncertainty, and the standard of proof required to establish legal facts contemplates these conditions of uncertainty. The procedures of legal fact-finding (particularly establishing the necessary legal facts to the requisite standard of proof), the courts have advised, must be adhered to, even though accuracy in fact-finding cannot be guaranteed. By displaying a resolute commitment to the requirement to engage the fact-finding process pragmatically and properly, and refusing to tolerate changes to it due to perceived injustice caused by medical/scientific uncertainty, the courts confirm that despite uncertainty, even scientific uncertainty, proper application of the procedures of legal fact-finding leads to just and proper adjudicative outcomes.

Part 3. Conclusion

This chapter was dedicated to explaining the derivation of the argument that consistent adherence to procedure is a integral to maintaining legitimate legal decisions. To recap: a process of legal fact-finding underpins adjudicative decisions. Legal fact-finding occurs in conditions of uncertainty due to time, economic and other constraints, resulting in evidentiary gaps. Despite these gaps, the task of the courts is to provide final decisions that will legitimately bind litigants. An appropriate application of the burden of proof is needed to balance the adjudicative conditions of uncertainty and the necessity for a final and binding legal determination. The burden of proof allows for legal facts to be established based on its likelihood, as opposed to on the basis of certainty. Because the standard of proof

of legal facts is less than certainty, the legal process inherently recognizes the impossibility of guaranteeing that legal fact-finding will be factually accurate. A 'less than certain' standard of proof brings with it a risk of factual inaccuracy. If factual inaccuracy manifests, then the substantive law will be applied to inaccurate legal facts. Legal outcomes in which such inaccuracy occurs can nonetheless be considered legitimate, so long as the relevant legal procedures were appropriately applied in arriving at the set of legal facts that gave rise to the outcome. This means that if the triers of fact properly relied on evidence that was appropriately presented at trial, to determine if the requisite standard of proof (properly understood) was established, then the legal facts that they arrive at are legitimate, despite the risk that they are factually inaccurate. If the law is then properly applied to those legal facts, the outcome is a legitimate, final and binding decision.

As explained above, judicial commentaries have demonstrate a steadfast commitment to the consistent application of the procedures of legal fact-finding, even where there is a perception of unfairness due to factual uncertainties arising out of scientific and medical uncertainty. The judicial commitment suggests the importance of procedural consistency in maintaining legitimate adjudicative decisions.

Within these judicial discussions, courts have provided an example of Sopinka J's insightful caution in the *Mohan* decision: over-reliance on scientific or medical evidence can distort the fact-finding process. I return to these and the other concerns that surround scientific evidence in my concluding chapter where I apply

the procedural legitimacy argument to the science and law discussion. Before turning to that conclusion, however, my next chapter aims to bolster the procedural legitimacy argument by demonstrating its applicability in another context. So far, I have discussed procedural legitimacy in the context of liability determinations. Next, I discuss its role in the context of determining damages entitlements, where the underlying principle of full compensation seems to emphasize substantive concerns or factual accuracy. The aim is to demonstrate that procedural legitimacy has a substantial role in maintaining adjudicative legitimacy even in that context, hence the significance of procedural legitimacy becomes even more evident.

Chapter 3: Illustrating Procedural Legitimacy in the Damages Stage of Personal Injury Litigation

Chapter Overview

Introduction

My intention so far has been to demonstrate that consistent adherence to procedure plays a significant role in the legal system's ability to produce legitimate determinations of liability. The argument is grounded in the conditions of uncertainty in which legal decisions are made. Augmented by the need to make quick and efficient decisions, achieving outcomes that are certainly factually accurate is an impossible guarantee. Accounting for the inevitability of uncertainty, legal facts are found on the basis of a probability, or a likelihood – something *less* than certainty – to a standard set by the relevant rules of proof. In civil matters, the standard of proof allows alleged facts that can be shown to be "more likely than not" to be treated as legal certainties. Accordingly, a legitimate legal fact is *probably* a

fact in reality, but not certainly so. Whether or not the legal fact equates to factual reality, the substantive law is applied to these legal 'facts' in order to arrive at a final and binding legal determination.

Procedural legitimacy provides a normative justification for adjudicative decision-making: decisions made in conditions of uncertainty may be substantively (i.e. factually) inaccurate, yet legitimately binding on litigants. As I argued in the previous chapter, adherence to the applicable procedural rules enables legitimate legal fact-finding within the requisite time and economic constraints in which adjudication operates. When evidence is properly admitted and weighed against the relevant standard of proof, the result is a valid finding of fact, whether or not it is substantively accurate. When the substantive law is then applied to that legal fact, the result is a legitimate legal determination. On this basis, I have suggested that consistency in procedure maintains the legitimacy of adjudicative outcomes, even in the face of inconsistency with factual reality, or substantive inaccuracy. This is called procedural legitimacy.

In this chapter, I embolden the procedural legitimacy argument by demonstrating its applicability in the damages stage of personal injury litigation. This illustration of procedural legitimacy is significant because factual accuracy, or substantive concerns are often emphasized when deciding on damages entitlements. If liability is established, then, in principle, the plaintiff is legally entitled to full restitution of

the losses suffered as a result of the tortious injury.[1] Arriving at the dollar amount of that entitlement is the end-goal of the damages stage of civil litigation. Contrasted with the liability stage, where the ultimate question to be determined is whether the defendant is legally liable, the ultimate question at the damages stage is more factual in nature – what is the dollar amount of the plaintiff's loss? Judging damages claims thus seems to be largely driven by substantive concerns; that is, guided by the goal of achieving full indemnity for the plaintiff, the court seeks to define exactly what that means, factually.[2]

If adherence to procedure has a significant role in maintaining legitimate outcomes even in a stage of litigation where substantive concerns are emphasized (e.g. the full indemnification principle), then the procedural legitimacy argument gains credence. That is why I would demonstrate the applicability of procedural legitimacy at the damages stage of adjudication. Ultimately, my goal is to show that procedural legitimacy is consistently applicable throughout the civil litigation process, even when diverse underlying policy choices generate different guiding principles that distinguish the stages of legal adjudication.

With that goal in mind, I demonstrate below how procedural legitimacy underlies damages determinations similarly to liability determinations. My discussion begins

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[1] I explain this principle further throughout this chapter.

[2] Peter Cane, *Atiyah's Accidents, Compensation and the Law* 5th ed (Toronto and Vancouver: Butterwoth Canada Ltd., 1993) at 121 [Cane, *Atiyah's Accidents*]: "The tort system is the only compensation system which professes to provide full compensation. All pecuniary losses (chiefly medical expenses and loss of income, both past and future) must be compensated in full…."

with a brief recital of the general principles that guide the court while determining a damages award. I then offer a critical description of the adjudicative process at the damages stage, explaining some of its unique features, and conclude by illustrating the significance of procedure this stage of the litigation process.

Part 1. The Damages Stage and its Phases

The following quotation contains the foundational principles that have driven the determination of damages awards since the time of its 1880 pronouncement by the House of Lords decision in *Livingstone v Rawyards Coal Co*.

> I do not think that there is any difference of opinion as to its being the general rule that, where any injury is to be compensated by damages, in settling the sum of money to be given for reparation of damages you should as nearly as possible get at that sum of money which will put the party who has been injured, or who has suffered, in the same position as he would have been in if he had not sustained the wrong for which he is not getting compensation or reparation.[3]

This statement provides the backdrop for determining damages entitlements: once liability is established, the plaintiff is entitled to be fully compensated, or to be restored to her injury-free condition, known as the *restitutio in integrum* principle. The Court is tasked with determining the dollar-figure that will accomplish this restitution by quantifying the harm that has resulted or that will result from the injury via assessing the value of the plaintiff's compensable loss.[4]

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[3] *Livingstone v Rawyards Coal Co*. (1880), 5 App. Cas. 25 at 39 (HL) cited in Berryman et al, *Remedies: Cases and Materials* 5th Ed (Toronto: Edmond Montgomery Publications Limited, 2006) at 3 [Berryman et al, *Remedies*], and cited in Kenneth Cooper-Stephenson and Iwan Saunders, *Personal Injury Damages in Canada*, 2d ed (Scarborough, Ontario: Carswell, 1996) at 109 [Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada*].

[4] Jamie Cassells and Elizabeth Adjin-Tettey, *Remedies: The Law of Damages*, 2d ed (Toronto: Irwin Law Inc, 2008) [Cassells and Adjin-Tettey, *Remedies*] at 11: the "normal measure of recovery in tort law is *restitutio in integrum*: the plaintiff is

To evaluate the plaintiff's compensable loss the court must determine the difference between the plaintiff's "original position" and the "injured position."[5] This requires drawing a comparison between the plaintiff's life with the accident and the plaintiff's life absent the accident. The difference between the two constitutes the plaintiff's compensable loss. In that effort, the Court must make findings of fact to establish what events *have* occurred as a result of the injury and, what *will* occur as a result of the injury (both of which are relevant to determining "injured position"), and what *would have* occurred if the injury had not occurred (which is relevant to "original position").[6]

Defining the compensable loss as 'what has happened and will happen in the plaintiff's life now that the tortious injury has occurred' *minus* 'what would have happened had the injury not occurred,' ensures that the damages awarded to the plaintiff are truly compensatory. Compensation for injuries is intended to restore the plaintiff to her accident-free condition, but not to award a windfall.[7] Once the

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entitled to be restored to the position she would have been in had the tort never been committed." For a judicial example, see *Milana v Cartsch* (1985), 49 B.C.L.R. (2d) 33 at 78, affirmed (1987), 49 B.C.L.R. (2d) 99 (C.A.): "The fundamental governing precept is *restituio in integrum*. The injured person is to be restored to the position he would have been in had the accident not occurred, insofar as this can be done with money."

[5] *Athey v Leonati* [1996] 3 SCR 458, 3 SCJ no 102 (QL) at para 32 [*Athey*].

[6] This is explained in Ken Cooper, "Assessing Possibilities in Damages Awards – The Loss of a Chance or the Chance of a Loss" (1972-73) 37 Sask L Rev 193 [Cooper, Loss of a Chance or Chance of a Loss], a later version of which formed the basis of chapter 4 of *Personal Injury Damages in Canada*, *supra* note 3.

[7] Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada, supra* note 3 at 7: "The concepts of 'compensation' or 'loss' for the purpose of a civil action for damages are not synonymous with their general usage, where the term 'loss' may describe a 'detriment' unconnected with any wrongful conduct…However, for the

relevant facts are established, the events that can be considered part of the compensable loss are determined. Thereafter, the compensable loss can properly be quantified in order to determine the dollar value of the plaintiff's legal entitlement.

Given the underlying fact-finding that is required to determine the plaintiff's compensable loss, and the valuation of that compensable loss thereafter, the damages stage can be conceptualized as a two phase project: Phase One is devoted to establishing legal facts to determine what is compensable, and Phase Two concerns the valuation, or quantification of these losses.[8] The following hypothetical example illustrates the two-phased nature of the damages stage.

A plaintiff has established liability for the knee injury she suffered in a car accident. The inquiry proceeds to the damages stage. There, the plaintiff alleges that she developed arthritis in her knee. She also alleges that she might need a knee surgery in the future. She seeks compensation for the arthritis and the potential knee surgery.

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purposes of civil actions for damages, the term 'loss' and therefore the concept of compensation, is causally tied to the wrongful event which produced the detrimental effects…"

[8] I do not suggest that these phases of the damages assessment stage are strictly separate in practice. Certainly, many of the inquiries undertaken to establish the legal facts to define the factual compensable losses will be relevant to the valuation of the compensable loss as well. But considering the two stages distinctly allows for conceptual clarity in order to appreciate the nature of damages assessment adjudication and the resultant determination of the plaintiff's entitlement.

To decide on the plaintiff's damages award, the court will have to determine whether the plaintiff is suffering from arthritis, whether the arthritis is in fact attributable to the tortious injury, and whether there is in fact a chance of a knee surgery in the future owing to the tortious injury. These are the factual findings that the court must make in order to determine the plaintiff's compensable harm. These factual decisions constitute what I refer to as Phase One of the damages stage. Once these are made, the court moves on to Phase Two, where it considers the valuation of these losses. At that stage, questions to be asked would include: what medical expenses did the plaintiff have in relation to the arthritis? What costs will she incur in case of future surgery? If the factual finding in Phase One suggests that the arthritis cannot be attributed to the injury, then it is non-compensable, and irrelevant to the valuation stage. Thus, Phase Two, valuation, is dependent on Phase One, fact-finding.

My upcoming discussion is divided in accordance with the two-phased approach to determining damages awards, so that the applicability of procedural legitimacy at both phases may be demonstrated.

Part 2. Procedural Legitimacy in Phase One

2(a). Proving the Factual Compensable Harms

The plaintiff bears the onus to establish the facts that he or she relies upon to demonstrate compensable harm before there is any entitlement to a monetary

evaluation of these harms[9]. This is similar to the plaintiff's onus at the liability stage, where the plaintiff must prove the facts that he relies on, in order for a liability determination to be made. As explained further below, the general nature of legal fact-finding is consistent between both the liability stage and the damages stage – the plaintiff bears the onus to prove his alleged facts, on the balance of probabilities. As explained in the previous chapter, the burden of proof allows for legal facts to be established on the basis of being more likely true than not, accounting for the tension between uncertainty and the need to make a timely, efficient and legitimate decision. Since the same tension exists in the damages stage of adjudication, it would follow that the legal system would accommodate it the same way in both stages.

There is a twist, though, in the damages stage, that has led to the misconception that the process and principle of proving legal facts is in some way different than it is in the liability stage. Recall that the full compensation principle requires that the plaintiff be returned to his injury-free position. This includes restoration for losses that may occur in the future. Consequently, as explained above, the determination of compensable loss, in accordance with the full compensation principle, necessitates two inherently uncertain inquiries. They are inherently uncertain because they require projection into the future, which is naturally unknown:

[9] Cassells and Adjun-Tettey, *Remedies, supra* note 4 at 12: "[T]he onus of proof of damages is on the plaintiff. The plaintiff must show, on the balance of probabilities, that the defendant's wrong was the cause of the harm suffered."

1. What will occur in the future due to the injury?
2. What would have happened in the future, irrespective of the injuries?[10]

The uncertainty contained in these inquiries calls into question whether future uncertainties should have to be proven in the same way as other legal facts are proven. For instance, should the hypothetical knee-injured plaintiff from above have to establish that she would more likely than not require the future surgery in order for the potential future surgery to form part of the compensable loss? Canadian jurisprudence has answered 'no.' Instead, the principle has developed to allow a *chance* of a future harm to be compensable through a method of valuation known as 'simple probability reasoning'.[11] As I explain further below, through simple probability reasoning, the chance of a future adverse events can be compensated by awarding damages according to the probability of the adverse event occurring. If, for instance, the probability of requiring a knee surgery in the future is 30%, then the plaintiff is awarded 30% of the total award that would compensate for the knee surgery.

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[10] Recall my previous discussion in Part 1 of this chapter. See also Peter Cane, *Atiyah's Accidents, supra* note 2 at 109. He describes these inquiries as follows: "[F]irst, it is necessary to predict what would have happened to the plaintiff if he or she had not been injured, a prediction which obviously cannot be verified or falsified by subsequent events. Secondly, the judge has to predict what is now likely to happen to the plaintiff."

[11] Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada*, *supra* note 3 uses this terminology. The same concept is also sometimes referred to as "probabilistic reasoning," which is the phrase used in Cassells and Adjin-Tettey, *Remedies, supra* note 4. Throughout this thesis, I use "simple probability" to refer to this analysis.

The use of simple probability reasoning can lead to the erroneous conclusion that legal facts are proven to a different standard at the damages stage. In the next sections, however, I explain that the process of legal fact-finding - the familiar balance of probabilities, and the subsequent treatment of that fact as a legal certainty - is consistent across both stages of adjudication, and is unaffected by the use of simple probability reasoning. Whether proving past facts, or the potential of a future event, legal facts are found on the balance of probabilities, and the substantive law is then applied to the set of legal facts found on that basis.

2(b). Past Facts: Establishing Harms that Have Occurred

Harms that have occurred at the time of trial are referred to here as 'past facts'. In *Athey v Leonati,*[12] the Supreme Court of Canada confirms that past facts must be established on a balance of probabilities, and are then to be treated as legal certainties. The plaintiff's damages can then be quantified on the basis of those past facts. The *Athey* decision therefore verifies that the fact-finding that occurs in Phase One of the damages stage, which establishes the compensable harms that underlie the quantification of damages (Phase Two of the damages stage)[13], occurs in the same way as the fact-finding that underlies liability determinations.[14]

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[12] *Athey v Leonati* [1993] BCJ No 2777 [*Athey* ,Trial Decision] and *Athey, supra* note 5.

[13] See my discussion in Part 1 of this chapter describing the two phases of the Damages Assessment stage of adjudication. Phase One is dedicated to establishing legal facts in order to determine which harms are compensable. In Phase Two, the losses arising from these harms are quantified, so that the plaintiff's damages entitlement can be determined.

[14] I interpret the *Athey* decision as being situated in the damages stage of adjudication. As I explain further in the main text, the defendants admitted that they were liable for Athey's injuries. Both the trial decision and the Supreme Court of Canada decision were aimed at determining the *extent* of that liability, or the

Athey suffered back injuries after being involved in two motor vehicle accidents. About 6 months after the accidents, while on the road to recovery, Athey went to a gym for a workout. He began his warm up, but was stopped short due to pain in his back. It was later discovered that Athey had suffered a disc herniation that required surgery. At trial, the two accidents were treated as one. The drivers of each of the cars that struck Athey's vehicle admitted liability, thereby acknowledging that they were liable to Athey for the damages he suffered as a result of the injuries caused by the accidents (the 'tortious injuries'). The issue was whether Athey was entitled to any or all of the losses he incurred due to the disc herniation.[15]

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amount of compensation that Athey was owed. In its reasons, the Supreme Court of Canada discussed principles that can be relevant to liability determinations, particularly regarding the requisite causal connection to establish liability for a negligent act. One of these principles was apportionment between tortious and non-tortious causes. The Court commented at 23 that "apportionment between tortious and non-tortious causes is contrary to the principles of tort law, because the defendant would escape full liability even though he or she had caused or contributed to the plaintiff's entire injuries. The plaintiff would not be adequately compensated, since the plaintiff would not be placed in the position he or she would have been in absent the defendant's negligence." Other principles that were discussed that could be applicable in the liability context include apportionment for divisible injuries, the impact of independent intervening events, and the thin and crumbling skull doctrines (at paras 24-25, 31-36) Because of the array of principles touched on, the language in the *Athey* decision can be confusing, sometimes typical of liability determinations, and sometimes typical of damages determinations. I maintain that the Supreme Court of Canada's decision in *Athey* can be characterized as a damages case, because the Court's inquiry was centered around what Athey's proper damages entitlements were. I use the *Athey* decision for the limited purpose of showing that the principles of fact-finding that are applicable at the damages stage are consistent with the fact-finding principles at the liability stage, as I explain further below. For a more comprehensive commentary on the *Athey* decision, see Dennis Klimchuk and Vaughan Black, "A Comment on *Athey v. Leonati*: Causation, Damages and Thin Skulls" (1997) 31 UBC L Rev 163.

[15] *Athey*, supra note 5. See Major J's renditions of the facts of the case at 2-7.

The trial judge had found that the tortious injuries were a 25% causal factor of the disc herniation, and Athey's pre-existing back problems were a 75% causal factor. Apportioning the damages on that basis, she awarded 25% of the total value of the losses arising out of the disc herniation. This meant that Athey was awarded 25% of the non-pecuniary damages, the out of pocket expenses, and the past and future income losses that were attributable to the disc herniation.[16] Athey appealed to the British Columbia Court of Appeal, arguing that he should have been awarded 100% of the damages resulting from the disc herniation. Southin J.A. of the British Columbia Court of Appeal declined to consider the argument, and dismissed the appeal.[17] The case was appealed further, and the Supreme Court of Canada considered whether the trial judge's approach provided Athey with proper compensation.

Deliberating this question, the Supreme Court considered whether the losses arising from the Athey's disc herniation were properly compensable, and to what extent. This required the Court to determine whether the tortious injuries caused the disc herniation. If so, then the disc herniation would be a compensable harm, but if not, then the losses arising from the disc herniation could not be compensable, because they would not be attributable to the tortious injuries. As Major J put it, "[t]he only issue was whether the disc herniation was caused by the injuries sustained in the accidents or whether it was attributable to the appellant's pre-existing back

[16] Athey, Trial decision, *supra* note 12. At trial, Athey's total losses were assessed at $221,516.78. This valuation was not contested at the Court of Appeal or at the Supreme Court of Canada levels.
[17] *Athey*, *supra* note 5 at para 10.

problems."[18] The legal fact that had to be established was the causal link between the tortious injuries and the disc herniation, in order to establish whether the disc herniation was compensable or not.

The Supreme Court of Canada overturned the trial judge's apportionment of the damages entitlement on the basis of causal factoring. "If the injuries sustained in the motor vehicle accidents caused or contributed to the disc herniation," Major J explained, "then the defendants are fully liable for the damages flowing from the herniation."[19] Deferring to the trial judge's finding that the causal link between tortious injuries and the disc herniation was established on the balance of probabilities,[20] the Supreme Court of Canada found that Athey was entitled to full compensation for the losses that accompanied the disc herniation.

In arriving at this conclusion, the Supreme Court explained that once established on the balance of probabilities, the causal connection between the tortious injury and the herniation becomes a legal fact. Once a legal fact is established to the requisite standard of proof, the relevant legal principles (in this case, the principle of full compensation) must be applied to those legal facts, as if they are certainties. Therefore, the valuation of Athey's losses (i.e. Phase Two of the Damages Stage) should have occurred on the basis that the tortious injuries caused the disc herniation, not on the basis that they *partially* caused the disc herniation: "[the disc

[18] *Athey, supra* note 5 at 7.
[19] *Ibid* at 41.
[20] *Ibid* at paras 43-45.

herniation] was a past event, which cannot be addressed in terms of probabilities. The plaintiff has the burden of proving that the injuries sustained in the accidents caused or contributed to the disc herniation. Once the burden of proof is met, causation must be accepted as a certainty."[21]

The trial judge made a reversible error when she apportioned the damages based on causal factoring, rather than treating causation as an established legal fact and awarding Athey's damages on that basis. First, her approach is contrary to the principles of legal fact-finding, which require that once a fact is proven to the required standard of proof, it becomes a legal certainty. Second, the error caused a misapplication of the principle that the plaintiff is entitled to full compensation for the losses arising from the indivisible harms that are attributable, in law, to the tortious injuries.[22]

The Supreme Court's holdings in *Athey* demonstrate that the nature of legal fact-finding (at least with respect to establishing past facts) is the same whether the legal facts are underlying damages determinations (as in *Athey*) or liability determinations. Expressing the same principle, Cooper-Stephenson and Saunders point to Lord Diplock's comments in *Mallet v McMonagle:* "in determining what did

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[21] *Ibid* at 30.

[22] "Apportionment between tortious and non-tortious causes is contrary to the principles of tort law, because the defendant would escape full liability even though he or she caused or contributed to the plaintiff's entire injuries. The plaintiff would not be adequately compensated, since the plaintiff would not be placed in the position that he or she would have been in absent the defendant's negligence." *Athey, supra* note 5 at 23.

happen in the past, a court decides on the balance of probabilities. Anything that is more probable than not, it treats as certain."[23]

But what about relevant events that are yet to occur, if they are to occur at all? Within its analysis in *Athey*, the Supreme Court remarked, in contrast to its above noted position regarding past events, a different approach might be taken when dealing with projections into the future. In the next section I explore the principle that the court refers to below:

> Hypothetical events (such as how the plaintiff's life would have proceeded without the tortious injury) or future events need not be proven on a balance of probabilities. Instead, they are simply given weight according to their relative likelihood…a future or hypothetical possibility will be taken into consideration as long as it is a real and substantial possibility and not mere speculation.[24]

2(c). Projecting into the Future: Proving Chances

What the Court described above in *Athey* is sometimes referred to as probabilistic reasoning or as simple probability reasoning, as mentioned above.[25] Simple probability reasoning allows for the chance or risk of a future event to be accounted for in the damages awarded. This concept has been endorsed and applied by the House of Lords, the Supreme Court of Canada, and by a number of Canadian provincial appellate courts. But while the ability to use simple probability reasoning in personal injury compensation is widely endorsed, it is sometimes mis-

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[23] *Mallett v McMonagle* [1970] AC 166, [1969] 2 All ER 186 [*Mallett v McMonagle*], cited in Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada*, *supra* note 3 at 71. This quote was cited with approval in *Athey, supra* note 5 at 29.
[24] *Athey, supra* note 5 at 27 (references removed) See also Cassells and Adjin-Tettey, *Remedies*, *supra* note 4 at 340.
[25] See note 11 above.

conceptualized as a different standard for proving future facts, suggesting that the process of proving facts is somehow different at the damages stage than it is at the liability stage.

Below, I provide a further explanation of simple probability reasoning and explain its proper conceptualization. This explanation demonstrates that simple probability does not embody any change in the process or principle of proving legal facts. The use of simple probability does not change the familiar requirement to prove relevant legal facts on a balance of probabilities, and to apply substantive legal principles to those facts. My argument regarding procedural legitimacy, based on the manner in which legal facts established on a balance of probabilities and then are translated into legal certainties, is applicable even where simple probability reasoning is employed. This demonstrates the procedural consistency throughout the two phases of adjudication, and shows that the concept of legitimacy through procedure is consistently applicable.

2(d). What Is Simple Probability?

Simple probability reasoning in the personal injury compensation context is grounded in the conceptual difference between past events and future/hypothetical events. Something that happened in the past is considered amenable to being 'proven' or established as a legal fact, while an event that is yet to occur (should it occur at all) is not understood to have the same 'provability.' Recall that what is established as a legal fact is then treated as a certainty. Facts that are projected to occur in the future, and hypothetical facts of the future (i.e. what would have

happened if the injury had not occurred) are, by definition, uncertain. Given this inherent uncertainty, it has been considered unnecessary to require proof that a future event or a hypothetical projection into the future will or would have occurred on a balance of probabilities, as is required in order to prove a past fact.[26] Instead, as Lord Reid states, "all you can do is to evaluate the chance [of a future event]…I do not see much difference between a probability of 50 percent and a probability of 49 per cent."[27] In this dictum, Lord Reid, expressed the principle of simple probability that had been set out a few years earlier in the House of Lords decision in *Mallett v McMonagle* and was quoted with approval and applied by the Supreme Court of Canada in *Janiak v Ippolito:*

> "In assessing damages which depend on [the court's] view as to what will happen in the future or would have happened in the future if something had not happened in the past, the court must make an estimate as to what are the chances that a particular thing will or would have happened and reflect those chances, whether they are more or less than even, in the amount of damages which it awards." [28]

Lord Reid's comments above contain the principle behind simple probability, and how the principle is put into practice: the court must consider the chance of a future event, even if the value of the chance is less than 50%. Once the value of the chance is assessed, that value is reflected in the damages awarded. For instance, if a plaintiff is able to establish a 30% chance of requiring a compensable future medical

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[26] As Lord Reid states in the House of Lords decision *Davies v Taylor* [1972] 3 All E.R. 836 at 839 [*Davies v Taylor*], "You can prove that a past event happened, but you cannot prove that a future event will happen and I do not think that the law is so foolish as to suppose that you can."

[27] *Ibid.*

[28] *Janiak v Ippolito* [1985] 1 SCR 146, SCJ no 5 at 42 [*Janiak v Ippolito*].

treatment, then 30% of the total assessed cost of that medical treatment will be awarded. That is the principle and applicability of simple probability reasoning.

Along with *Janiak v Ippolito*, where the principle of simple probability was applied in respect of mitigation of damages,[29] the principle has been applied in a number of Canadian appellate decisions in the personal injury context. For example, in *Conklin v Smith*[30], the Supreme Court of Canada accounted for the chance that the plaintiff would have pursued a more lucrative career had he not sustained the injury; in *Kovats v Ogilvie*[31], the Court considered, and compensated for, the chance of developing post-degenerative arthritis as a future consequence of the tortious injury; in *Graham v Rourke*[32], simple probability reasoning was used to account for

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[29] A more detailed account of how simple probability reasoning was applied in *Janiak v Ippolito, ibid,* is provided in Part 3(c) of this chapter.

[30] *Conklin v Smith* [1978] 2 SCR 1107. Here the plaintiff had lost a leg due to the negligence of the defendant. As a result, he was unable to pursue his desired career as a commercial pilot. The Court found that there was a chance that he would have succeeded in his future pursuit of this career, and awarded earning loss based on the chance that he might have succeeded.

[31] *Kovats v Ogilvie* [1971] 1 WWR. 561, [1970] BCJ No 653 (QL) (BCCA) [*Kovats v Ogilvie*] at para 15: "Upon the whole of the evidence of the three doctors…I am driven to infer that at the time of trial there was a real and substantial risk that within a few years Kovats would be seriously incapacitated by post-traumatic or degenerative arthritis in his left hip. This is an important element in determining the seriousness of the injury and the amount that Kovats is entitled to for compensation."

[32] *Graham v Rourke* (1990) 74 DLR (4th), [1990] OJ no 2314 (QL) (ONCA) [*Graham v Rourke*]. Here, the plaintiff was involved in a minor car accident that had a significant impact on her life. She had a number of pre-existing back problems. In 1974 she was involved in a previous accident. That accident had had a serious impact on her life, including rendering her unable to work until 1982. The relevant accident occurred in 1984. She was left unable to work again, and the medical prognosis was that she was unlikely to recover in the near future. At trial, the plaintiff received an award for both loss of income and cost of her future care. The loss of income claim was reduced by 25% based on a 25% *chance* that she would not

the chance (or hypothetical projection into the future) that the plaintiff's future earnings would have diminished irrespective of the injury sustained, and the chance that she would have required future care, even absent the accident; and in *Schrump v Koot,*[33] the Court found that the risk of a future surgery warranted compensation, finding that the possibility of a future surgery was fairly and properly left to the jury.

The principle of simple probability and its use to place a value on a chance or risk is undoubtedly endorsed in Canada. Sometimes, however, simple probability reasoning is erroneously described as encompassing a different standard of proof for future facts, so the availability of simple probability endorses an altogether different method of proof for much of the damages stage. For instance, Cooper-Stephenson and Saunders state:

> "At the root of damage assessment is a different standard or method of proof…The different standard of proof which governs most of a damage assessment may be termed "simple probability." It involves the valuation of possibilities, chances and risks according to the degree of likelihood that

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have been able to earn as much as anticipated even if she had not suffered the relevant accident. The cost of care award was reduced by 15% because "[g]iven [the plaintiff]'s vulnerable condition and the potentially severe effects of even mild trauma, [the Court was] satisfied that there was a possibility that some or all of these services would have been required…even if she had not been in the accident." The possibility was assessed at 15%. These reductions based on chances of future events were justified on the basis of the availability of simple probability reasoning. These types of reductions are sometimes referred to as "contingency" reductions.

[33] *Schrump v Koot* (1978) 18 OR (2d) 337 (QL) (O.C.A.) [*Schrump v Koot*]. Here, the defendant had argued that because the medical evidence suggested that the chance of requiring future surgery was less than 50% (i.e. the occurrence of the surgery in the future would fall short of proof on the balance of probabilities), the jury should have been instructed to disregard the potential future surgery altogether. The Court rejected this reasoning, and opined that the *chance* of the future surgery is compensable, even if the occurrence of the surgery in the future cannot be established on the balance of probabilities. The contrast between simple probability reasoning and proof on a balance of probabilities is discussed further below.

> events would have occurred, or will occur. This contrasts with the "balance of probabilities" standard, more familiar in civil actions, which involves an "all-or-nothing" approach."[34]

I presume that the description of simple probability as a standard of proof arises because the impact of simple probability reasoning in respect of future facts is often contrasted with the impact of balance of probability reasoning on past facts. This contrast is evident in the above quotation.[35] The familiar balance of probabilities standard is accompanied by an "all-or-nothing" impact because if a fact is proven on the balance of probabilities, it is thereafter treated as an absolute certainty for legal purposes. The subsequent legal determination will be applied to that fact as if it were certainly true. And if the balance of probabilities is not achieved in respect of a fact, then the fact will have no relevance to the subsequent legal determination. For instance, if a doctor's act is 30% likely to have been a breach of his standard of care, then no breach will be established, and the plaintiff has no claim. If, however, the evidence suggests a 60% likelihood that the doctor's action was a breach of his standard of care, then the breach is established as a legal fact – for liability determination purposes, the doctor was certainly in breach of his standard of care.

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[34] Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada, supra* note 3 at 67. At 414, Cooper-Stephenson and Saunders write, "Significant issues sometimes arise with respect to both the presentation of evidence and the standard of proof in the context of the claim for cost of future care. Basic principles apply, and it must be emphasized that the standard of proof is "simple probability" – a different standard than the normal balance of probabilities test."

[35] In Cooper, Loss of a Chance or the Chance of A Loss, *supra* note 6, Coopers compares the simple probability approach to the American all-or-nothing approach to damages valuation, advocating for the simple probability approach. There, he persuasively argues that simple probability reasoning reflects the fact that the creation of a risk is really what is being compensated (see especially 222 and 231-235). I agree. It would follow from this that it is the *risk* that is being proven as a legal fact, not the future fact itself.

In contrast, because of the availability of simple probability reasoning, future events themselves are not taken to be certainties. Instead, the future event is understood as possibility rather than certainty, and that possibility is relevant to the legal determination of the value of the plaintiff's award.

This inclination to contrast the all-or-nothing impact with simple probability reasoning is evident in the excerpt below as well. After recounting the use of simple probability reasoning in *Schrump v Koot*, where the Court endorsed probability based damages founded on the likelihood of a future surgery, Cassells suggests that:

> "it is important to note that the court rejected an all-or-nothing approach under which the plaintiff receives 100 percent compensation if it can be shown that the loss is "likely" to occur and nothing if it is "unlikely" to occur. Instead, uncertainty about the future is reflected in the amount of the award, "with the higher degree or the greater chance or risk of a future development attracting a higher award" [quoting *Schrump v Koot*]." [36]

I take no issue with the explanation of simple probability as a method of placing a value on a chance or risk of a future event. Nor do I suggest that it is erroneous to point out that the ability to compensate a chance or a risk of a future event prevents future events themselves from being subjected to the balance of probabilities standard of proof and accompanying "all or nothing" approach. But it is necessary for my analysis to point out that the suggestion that simple probability reasoning is itself a different standard that is required to prove a future fact is misleading, as is a

[36] Cassells and Adjin-Tettey, *Remedies, supra* note 4 at 331.

contention that the Court has rejected an all-or-nothing approach by endorsing simple probability reasoning.[37]

Simple probability reasoning is not a method of proving future facts, as implied when it is described as a standard of proof for future facts. Much to the contrary, the availability of simple probability reasoning constitutes a recognition that future facts themselves cannot be proven at all. Instead of proving the future event itself, the principle has developed that the existence of a *chance* or the *risk* of a future event is what must be proven. If the existence of a *chance* of a future event is established, on a balance of probabilities, then simple probability reasoning is applied as a method of *quantifying* that chance of the future event, not a method of *proving* that fact itself.

Cases that have applied simple probability reasoning are consistent with this description. For example, in *Schrump v Koot* (which is considered to contain a clear

[37] For further discussions relevant to the assessment of damages based on the loss of chance doctrine compared to the more familiar all or nothing approach, see Charles T. McCormick, "The Standard of Certainty in the Measurement of Damages" (1933-34) 43 Yale LJ 1109; Joseph King, "Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences," (1980-81) 90 Yale LJ 1353; "Damages Contingent Upon Chance" (1963-1964) 18 Rutgers L Rev 875; John E. Coons, "Approaches to Court Imposed Compromise – The Uses of Doubt and Reason" (1963-64) 58 Nw UL Rev 750 and Cooper Loss of a Chance or Chance of a Loss*, supra* note 6. These articles outline provocative ideas related to the utility of simple probability reasoning compared to the all or nothing approach, though it is not my project to engage in a debate over the utility of one over the other, but to demonstrate what the approach is, and its proper conceptualization.

statement of simple probability reasoning[38]), the Ontario Court of Appeal confirmed that while proof on the balance of probabilities is required to demonstrate that the harm suffered was that effectively caused by the tortious injury, the plaintiff is not obligated to prove that a future loss or damage *will* occur.[39] Rather, the obligation is to establish a non-speculative possibility of such a future loss. In other words, the existence of this non-speculative possibility must be established on the balance of probabilities, not the future event itself.

The endorsement of this principle – that the non-speculative chance of a future event is what the plaintiff must establish, as opposed to the event itself - is explained clearly in the *Kovats v Ogilvie* decision, which was quoted with approval in *Schrump v Koot.*[40] There, simple probability reasoning was employed to account for the possibility of developing "post traumatic arthritis resulting from the injury" in a serious motor vehicle collision.[41] The British Columbia Court of Appeal explained that:

> It is a fundamental rule that in civil cases questions of fact are to be decided on a balance of probabilities; this is a matter of proof…one can decide on a balance of probabilities that there is a risk of something happening in the future. In an appropriate case such a risk can be taken into account in assessing damages for the wrongful act or default that caused it.[42]

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[38] For instance, Cooper-Stephenson and Saunders in *Personal Injury Damages in Canada*, *supra* note 3 state at 69 that "[t]he statement of Lacourciere J.A. in Schrump is often treated as the locus classicus."
[39] *Schrump v Koot*, *supra* note 33 at 4 (cited to QL page numbers).
[40] *Ibid* at 6.
[41] *Kovats v Ogilvie, supra* note 31 at 5.
[42] *Ibid* at 6.

The Court is clear that if it is established on the balance of probabilities that the tortious injury has resulted in a risk or a chance of a future event, then such a risk can be taken into consideration for the purposes of valuation. The valuation will be undertaken on the basis of simple probability reasoning – the total assessed value of the future event will be multiplied by the percentage likelihood of its occurrence. The legal fact being proven is the chance or risk, not the future event itself.

Understood in this way, it becomes clear that the use of simple probability reasoning does not represent an abandonment of the familiar burden of proof, nor the accompanying "all or nothing" outcome. The existence of a compensable, non-speculative chance of a future event is subject to the same standard of proof as any other legal fact, and once established, the chance of a future event is treated as a legal certainty – the existence of the chance becomes a legal fact, and the chance is then given a value when the court quantifies the plaintiff's loss. Simple probability is simply the metric that is employed to quantify that chance or risk. Consequently, the use of simple probability as a valuation technique for chances of future events does not constitute any change in the nature of legal fact-finding. Nor does it alter the principle that legal determinations are under-pinned by legal facts, which are found on the basis of the balance of probabilities.

Just like at the liability stage, at the damages stage too, legal facts (including chances or risks of future events) must be established on the balance of probabilities. If established on that basis, they are treated as legal certainties, and may be

legitimately accounted for during the valuation process. Thus, the damages stage of adjudicative analysis is symmetrical to the adjudicative inquiry at the liability stage: at the liability stage, a determination of whether the defendant is liable to the plaintiff is made based on the legal facts that are established, by applying the evidence to the balance of probabilities standard; at the damages stage, the calculation of the compensable loss occurs on the basis of the legal facts that are similarly established on the balance of probabilities standard. In the next section, I reiterate the argument of procedural legitimacy, that legitimate adjudicative outcomes arise from legitimate (or procedurally sound) legal fact-finding.

2(e). Procedural Legitimacy in Phase One of the Damages Stage

Thus far, I have demonstrated that the argument of procedural legitimacy developed in the previous chapter with reference to the liability stage is equally applicable at the damages stage. At both stages of adjudication, the relevant legal facts are to be proven on the balance of probabilities. The substantive legal principles are then applied to those legal facts. As explained in the previous chapter, the balance of probabilities burden of proof contemplates the potential that a legal fact does not correspond with an actual fact. Nonetheless, a legal determination is made on the basis of those legal facts. Thereby, a legal outcome may be legally legitimate, though inconsistent with factual reality.

In the damages context, the legal facts that are established become the basis for the valuation of the damages, which constitutes the plaintiff's legal entitlement upon having suffered a tortious injury. The valuation of the plaintiff's entitlement is,

therefore, based on legal facts which are more likely to be true than not, but which may or may not correspond with factual reality. For instance, suppose the medical evidence presented at the damages stage convinces the trier of fact that a plaintiff's arthritic condition was more likely than not the result of the tortious injury. There remains the possibility that the arthritic condition was not actually caused by the tortious injury, but the causal link being established as a legal fact, the arthritic condition will form part of the compensable loss, and will be included in the plaintiff's damages award.

Of course, if the arthritis was not, in fact, caused by the tortious injury, then the valuation of the plaintiff's award will be based on an inaccurate fact, and the result will be a substantively inaccurate valuation of his indemnity for the harm caused by the injury. However, the legitimacy of the adjudicative outcome is not thereby compromised, so long as the relevant procedural rules were adhered to in determining to treat causation as an established legal fact. This means that the admissibility rules must have been appropriately applied to the medical evidence presented, so that it was properly before the trier of fact. Once admitted, the medical evidence (along with all the other evidence presented to establish the causal link between the injury and the arthritis) must have been properly weighed against the standard of a balance of probabilities. If these evidentiary and procedural rules are adhered to, then the finding that since the legal test for causation is established on the balance of probabilities, the arthritis being taken to be causally linked to the tortious injury is legitimate. Therefore, incorporating the

assessed value of the arthritis based on that legal fact is similarly legitimate, though potentially resulting in a substantively inaccurate compensation award.

Thus, even at the damages stage, the legitimacy of the adjudicative outcomes is dependent on adherence to legal procedures. If the legal facts that underpin the legal determination are factually inaccurate, then the legal determination of the value of the award is destined for substantive inaccuracy. This does not mean that the adjudicative determination of the plaintiff's legal entitlement is destined to be illegitimate. As long as the legal facts are found with procedural propriety, and the substantive law is then applied appropriately to those facts, the result is a legitimate legal determination, whether or not it is factually accurate.

This concludes my discussion of procedural legitimacy in particular reference to Phase One of the damages stage of adjudication. Of course, because Phase Two (valuation) is based on Phase One, my comments above are relevant to the damages stage in its entirety. Still, a discussion of the valuation stage is warranted, because it culminates in the dollar figure that is awarded to the plaintiff and represents the end point of civil adjudication itself. In the process of valuation, the court undertakes an uncertain and difficult task, often requiring the assistance of actuarial, economic and especially medical/scientific expertise. Despite the difficulty, the court manages to arrive at a dollar figure that becomes the plaintiff's legal entitlement.

In the upcoming section, I demonstrate that though the valuation stage of the damages analysis is driven by substantive goals, particularly in respect of determining pecuniary losses (which will be my focus), the valuation process is also afflicted by uncertainty, resulting in the risk (or indeed, likelihood) of substantively inaccurate valuation and, therefore, inaccurate compensation.[43] Because of the uncertainties at the valuation stage, even if all underpinning fact-finding happened to be factually accurate, the dollar figure awarded at the end of the process is likely to be inaccurate. But the determination is legitimate, so long as it is arrived at through consistency in principle and procedure.

Part 3. Procedural Legitimacy in Phase Two: Valuation

3(a). Valuation of Pecuniary Losses

Once the plaintiff has established that the harms alleged are related to the tortious injury, and therefore compensable, he or she bears the additional onus of proving

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[43] Along with pecuniary damages, damage awards also include non-pecuniary, intended to provide solace for intangible losses, like loss of the amenities of life, pain and suffering, etc. In respect of non-pecuniary damages, Dickson J, speaking for the Supreme Court of Canada in *Andrews v Grand & Toy Alberta Ltd.* [1978] 2 SCR 229 stated, "The monetary evaluation of non-pecuniary losses is a philosophical and policy exercise more than a legal or logical one. The award must be fair and reasonable, fairness being gauged by earlier decisions; but the award must also of necessity be arbitrary or conventional. No money can provide true restitution." Although pecuniary damages are compensatory, the difficulty of compensating non-monetary losses with money is obvious. Still, as Dickson J's comments indicate, the fairness of non-pecuniary awards is maintained so long as the principle of precedent, which ensures consistency in adjudication, is adhered to. These comments support my upcoming conclusion that consistency in principle and procedure maintains the legitimacy of valuation determinations where the compensation to be provided is necessarily arbitrary. I have chosen, though, to limit my discussion in this chapter to valuation of pecuniary damages, because compensating pecuniary (or monetary) losses with money lends itself to factual accuracy more so than compensating non-pecuniary damages with a dollar figure. This focus enables me to demonstrate the significance of procedural legitimacy even in a situation where factual accuracy bears a particular emphasis.

what losses he or she suffered arising from those harms. The plaintiff must demonstrate pecuniary losses with reasonable certainty.[44] Pecuniary losses can be divided into pre-trial losses (sometimes called 'special damages') and future losses. Pre-trial pecuniary losses can be placed into two broad categories: cost of care and loss of working capacity. Pre-trial cost of care includes any medical expenses related to the tortious injury and any compensable harms arising from it. The loss of working capacity includes lost earnings, lost profits and loss of home making capacity.[45] The quantification of these pre-trial pecuniary losses is usually relatively uncontroversial because they can be accurately documented and demonstrated by the plaintiff.[46] But uncertainties in valuation are particularly emphasized in personal injury claims because the impact of the injury can continued into the future, which is relevant to the value of the plaintiff's compensation.

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[44] See Cassells and Adjin-Tettey, Remedies, *supra* note 4 at 12 and 320; Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada*, *supra* note 3 at 130, discussing special damages stages: "As for proof, the onus on the plaintiff to produce evidence is greater under the head of special damages, and the view has been forwarded that the plaintiff should take particular care to be accurate in this respect."

[45] See Generally Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada, supra* note 3, Chapter 4 and Cassells and Adjin-Tettey, *Remedies, supra* note 4 at 119-159 for a more detailed account of special damages. See also Christopher Bruce, *Assessment of Personal Injury Damages*, 4th ed (Markham, Ontario: LexisNexis Canada Inc, 2004) [Bruce, *Assessment of Personal Injury Damages*] for a useful practical guide for demonstrating pecuniary losses.

[46] Cassells and Adjin-Tettey, *Remedies, supra* note 4 at 120. For a brief discussion of some difficulties that may be associated with establishing pre-trial losses, see Cooper-Stephenson and Saunders, *Personal Injury Law in Canada, supra* note 3 at 127.

In principle, losses of the future and losses of the past are treated similarly.[47] The categories of future pecuniary losses that are compensable are parallel to the categories of pre-trial pecuniary losses: future cost of care and prospective loss of earnings. Quantifying the future cost of care would require the court to undertake a number of uncertain and difficult inquiries. For example, it would have to determine the appropriate level of care that the plaintiff will require in the future, an inquiry dependent on medical expertise. The duration that the care will be required would have to be approximated. This would also depend on medical evidence indicating the plaintiff's prognosis, and in the case of life-long injuries, on actuarial evidence relevant to life expectancy. The loss of prospective earnings can similarly elicit uncertain and challenging projection in the future – how long would the plaintiff's working life have been? To what extent would his income have increased over time, considering his line of work? How successful would he be? What contingencies may have affected his working life irrespective of the injury? How, and to what extent will the answers to these questions be affected, now that the plaintiff has been injured?[48]

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[47] As stated in David Kemp, ed, *Damages for Personal Injury and Death*, 5th ed (London: Longman Group Ltd, 1993) [Kemp, *Damages*] at 88-89: "There is no difference in principle between the damages awarded for past pecuniary loss and the damages awarded for future pecuniary loss. In each case the court seeks to assess and award damages that are equivalent to the loss sustained by the plaintiff – in each case the same heads of damage are recoverable and in each case similar deductions have to be made…The real difference between the two categories of damage is that past loss is certain, or largely certain, whereas future loss is, by its very nature, uncertain."

[48] For a thorough examination of evidence that is useful to the court's inquiries in assessing pecuniary loss, see Bruce, *Assessment of Personal Injury Damages, supra* note 45, Chapter 14.

Moreover, if the plaintiff successfully established that the injury caused a non-speculative chance of future harm, like the chance of a future surgery, then the court would require expert evidence indicating the likelihood of such a surgery so as to place a value on that chance. The court would then have to determine all the pecuniary losses associated with that surgery in order to determine what the total value of that harm would be, and then award the percentage of that value based on its likelihood.

As Cassells and Adjin-Tettey succinctly put it, "personal injury compensation is often largely about guessing the unknowable and pondering the unponderable."[49] Nonetheless, neither difficulty nor uncertainty are justifiable excuses to shirk the task of determining the plaintiff's damages award[50]. While the plaintiff is obliged to bring the best evidence to prove his losses, he is also entitled to compensation for losses that are not too remote. As noted in *C & B Corrugated Containers Inc v Quandrant Marketing Ltd*, "a court must bite the bullet and assess the damages on the basis of all available evidence." [51] Consequently, while uncertainty makes the application of the full compensation principle difficult, courts must arrive at a final and binding dollar amount will compensate the plaintiff, which litigants will be legitimately bound to, resulting in a particularly tense exercise at the valuation stage of determining damages.

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[49] Cassells and Adjin-Tettey, *Remedies, supra* note 3 at 113.
[50] See for example *Canlin Ltd v Thiokol Fibres Canada Ltd.* (1983) 40 OR (2d) 687, cited in Cassells and Adjin Tettey, *Remedies, supra* note 3 at 331*:* "The Court will not shirk the assessment of damages merely because the task is difficult or uncertain."
[51] *C & B Corrugated Containers Inc v Quandrant Marketing Ltd* [2005] OJ no 1665 at 57 (Ont. Supreme Court of Justice).

This tension between uncertainty and the need to make a final and binding determination of the plaintiff's entitlement to damages was explored by the Supreme Court of Canada in a series of three tragic personal injury cases, all released in 1978. These cases provide illustrations of how uncertain and speculative the valuation of a plaintiff's losses can be, despite which, the court makes a determination of the plaintiff's loss, and defines the legal entitlement of the plaintiff and the legal obligation of the defendant.

3(b). Difficulties in Valuation as Explored in the Trilogy

The three decisions, *Andrews*, *Thornton* and *Teno*,[52] all concerned the valuation of damages for young plaintiffs rendered quadriplegics by the negligence of others. The facts of *Andrews* and *Thornton* are very similar. Both plaintiffs were young (21 years old and 18 years old at the time of trial). Both sustained injuries that left them life-long quadriplegics, though they sustained no impact on their mental capacities. In *Teno*, the plaintiff was a four-year-old child who suffered significant physical disability (though she was not rendered quadriplegic), and also sustained an injury to her mental capacity. In all three cases, it was established that the young plaintiffs would require full time care for the duration of their lives, requiring the court to undertake a number of highly speculative inquiries.

Canvassing several authorities, Dickson J (as he then was), writing for the Supreme Court of Canada in *Andrews*, confirmed the well-established principle that a plaintiff

[52] *Andrews v Grand & Toy* [1978] SCR 229, 1978 CanLII 1(cited to SCR) [*Andrews*]; *Thornton (Next Friend of) v Prince George School District No. 57* [1978] 2 SCR 267, 1978 CanLII 12 (cited to SCR) [*Thornton*]; *Arnold v Teno (Next friend of)* [1978] 2 SCR 287, 1978 CanLii 2(cited to SCR) [*Teno*].

is entitled to recover the full extent of his pecuniary loss, so that, to the extent possible, he may be restored to the position he would have been in absent the injures.[53] Accordingly, Dickson J explained that when a claim is made for future expenditures that will have to be incurred by the plaintiff due to his injuries, the principle of full compensation applies: "In theory, a claim for the cost of future care is a pecuniary claim for the amount which may reasonably be expected to be expended in putting the injured party in the position he would have been in if he had not sustained the injury."[54] Given the uncertainty of the future, however, the Court likened the determination of cost of future care to "crystal ball gazing," and expressed some of the resulting difficulties. Below I discuss two such inquiries that the Supreme Court of Canada undertook in the Trilogy cases in determining the plaintiffs' entitlements: their life expectancies to determine the duration of the award, and the prospective earning capacities of the young plaintiffs.[55] I provide a brief illustration of the uncertainty that pervades the valuation of each plaintiff's loss, and how this can lead to substantive inaccuracy.

In the case of life-long injuries, courts must determine the life expectancy of a plaintiff so as to determine the duration of compensation required. In *Andrews*,

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[53] *Andrews, supra* note 55 at 242.
[54] *Ibid*.
[55] My discussion here is not intended to fully explore the complexities of calculation in determining the plaintiff's loss. Rather, I use the Court's comments in the Trilogy cases to (briefly) demonstrate the speculative and uncertain task of valuing the plaintiff's losses. For a further discussion on the Trilogy cases, see, for example, B Feldthusen & K. McNair, "General Damages in Personal Injury Suits: The Supreme Court's Trilogy" (1978) 28 U.T.L.J. 381, which focuses on how the cases treat non-pecuniary losses. Also see Berryman et al, *Remedies, supra* note 3, Chapter 5, which contains a more detailed discussion of the Trilogy cases.

Dickson J comments on the difficulty associated with making that determination, referring to the nature of the evidence courts must rely on:

> "…the apparent reliability of assessments provided by modern actuarial practice is largely illusionary, for actuarial science deals with probabilities, not actualities…so long as we are tied to lump sum awards, however, we are tied also to actuarial calculations as the best available means of determining amount…the courts must proceed on established principles to award damages which compensate accident victims with justice and humanity for the losses they may suffer." [56]

Naturally, it is impossible to predict a plaintiff's life expectancy with certainty. But on the basis of probabilistic actuarial evidence, the court must decide on the duration of the plaintiff's entitlement in order to quantify the plaintiff's future entitlement. It is quite likely that this determination of life expectancy is incorrect, and the quantification of damages results in substantively inaccurate compensation: under-compensation if the Plaintiff dies later than expected, or over-compensation, if the plaintiff dies earlier than expected. Nonetheless, the court makes a quantification based on actuarial evidence that is indicative of life expectancy and a certain dollar amount is arrived at on that basis. At trial in *Andrews*, two doctors testified that the life expectancy of a quadriplegic would be 5 years less than normal, and the actuarial evidence indicated the general life expectancy of a 23 year old is 50 years, and the award was calculated accordingly.

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[56] *Andrews*, *supra* note 52 at 237. As this quotation suggests, there is some discontentment surrounding the use of lump sum awards, but exploring that debate is outside the scope of this thesis. I proceed on the basis that current damages awards generally take the form of lump sum payments. This requires projections into the future, resulting in uncertainty. Also, I acknowledge that parties can reach agreements and court-sanctioned periodic payments, rather than lump sum awards. However, my focus is on the adjudicative process of arriving at the lump sum that will constitute the plaintiff's damages entitlement, in the uncertainty context that this adjudicative determination takes place.

Along with determining life expectancies, another difficulty discussed in the cases was quantifying the plaintiff's prospective loss of earning. "We must now gaze more deeply into the crystal ball," Dickson J stated, commencing his consideration of Andrews' prospective loss of earnings. "What sort of a career would the accident victim have had? What were his prospects and potential prior to the accident?" he continued.[57] The speculative nature of determining prospective lost earnings was particularly exaggerated in the *Teno* decision, where the plaintiff was only four-years-old, so there was no evidence as to what her future earning prospects could be. Determining her future income loss was entirely speculative. Still, the Court commented:

> "I do not think we can assume that a bright little girl would not have grown up to earn her living and would be a public charge, and we are not entitled to free the defendants, who have been found guilty of negligence, from the payment of some sum which would be a present value of the future income which I think we must assume the infant plaintiff would earn."[58]

The Court in *Teno* awarded a somewhat conventional sum, something in between mere poverty level at the lower end, and a salary based on the salary of her mother, which the Court below awarded, as there was no evidence that she would follow in her mother's footsteps.[59]

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[57] *Andrews, supra* note 52 at 252.
[58] *Teno, supra* note 52 at 330.
[59] *Ibid* at 330-331. For a critique of the methodology of valuation of loss of income awards in *Teno*, and for femal plaintiffs generally, from a feminist perspective, see Elaine Gibson, "The Gendered Wage Dilemma In Personal Injury Damages" in Ken Cooper-Stephenson and Elaine Gibson, eds *Tort Theory* (Ontario: Captus Press Inc., 1993) at 185. For a commentary identifying gender biases in personal injury damages awards, which includes commentary on the *Teno* decision, see Jamie Cassels, "Damages for Lost Earning Capacity: Women and Children Last." (1992) 71 Can Bar Rev 445.

Bound by the full compensation principle and providing compensation for all the plaintiff's losses, courts must struggle to determine the monetary value that can be said to properly compensate the plaintiff, despite the extremely speculative nature of this task, caused by the requirement to project into the future. It has been suggested that simple probability reasoning (discussed above), to some extent, eases the difficulty of projection into the uncertain future[60]. This suggestion stems from the view that simple probability allows for future facts to be proven differently than past facts, which I have previously suggested is misleading.[61] At this juncture, therefore, I briefly show why simple probability reasoning does not do much to conquer the uncertainty that the valuation of the plaintiff's loss occurs in. Thereafter, I return to some of the Supreme Court's comments in the Trilogy that support my conclusion that although the speculative circumstances in which damages assessment takes place results in the risk that the determination of the plaintiff's loss is substantively inaccurate, adherence to legal principle and procedure ensures that the court's ultimate determination of the plaintiff's legal entitlement is, nonetheless, legitimate.

3(c). Simple Probability Re-visited

Recall that simple probability reasoning is relevant to the valuation of chances of future events. If the existence of a compensable chance or risk is established on a

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[60] See, for instance, Cooper-Stephenson and Saunders, *Personal Injury Damages in Canada, supra* note 3 at 414: "Significant issues sometimes arise with respect to both the presentation of evidence and the standard of proof in the context of the claim for cost of future care. Basic principles apply, and it must be emphasized that the standard of proof is "simple probability" – a different standard than the normal balance of probabilities test." (Cited earlier, see note 26).

[61] See Part 2(d) of this chapter.

balance of probabilities, then the chance itself must be given numeric value – the court must determine *how* likely the future event is. Then costs associated with the future event itself must be quantified, and the damages awarded will be the total value multiplied by the percentage likelihood that the event will occur in the future. The application of the simple probability metric to account for future chances and risks does not change the level of uncertainty in the actual quantification of the loss. This is because the valuation of the chance itself is uncertain, and determining the value of the loss, to which the percentage can be applied, is also uncertain and speculative. Though simple probability allows for a valuation of a chance, rather than requiring proof of a future event itself, the determination of the value of the chance is still highly susceptible to substantive inaccuracy.

In terms of placing a value on the likelihood of a future occurrence, the likelihood itself is speculative. For instance, if a plaintiff alleges that there is a chance that he will acquire a further medical condition in the future, the court will have to come to a certain conclusion as to the percentage likelihood of that risk manifesting. Though the court will be assisted by medical evidence, it is highly unlikely that there will be uncontested medical evidence which would place a certain and single figure on that chance. In *Kovats v Ogilvie*, for instance, the medical evidence suggested that there was somewhere in between a 33-50% chance that the plaintiff would acquire disabling arthritis in the future.[62] In *Schrump v Koot*, the plaintiff's expert suggested

[62] *Kovats v Ogilvie, supra* note 31 at 5.

a 25-30% chance of requiring a future surgery.[63] So, the evidence as to the risk of a future harm is itself speculative, and though helpful, the court is still left to set a single figure that it will eventually award as the value of the chance. This is undoubtedly a somewhat arbitrary exercise, though it is based on the expert evidence presented.

Beyond the speculation associated with determining the percentage likelihood of a future event, simple probability reasoning requires that the total value of the future loss be determined so that the percentage can be applied to that total amount. Determining the total amount is also a speculative exercise. For instance, to award some amount for the loss of a chance of a lucrative career, the same speculative questions that Dickson J referred to in *Andrews,* would render difficulties – how successful would the plaintiff be if he did manage to pursue his lucrative career? Or in the case of a chance of a further medical harm, what impact would the future harm have on the plaintiff, if it occurs? All the uncertainties associated with gazing into the future will bear an impact, even where simple probability reasoning is applied.

Moreover, once the simple probability metric is applied to place a value on a lost chance or an increased risk, the eventual result in terms of the monetary indemnification of the plaintiff will be substantively inaccurate. If, for example, it was determined that there was a 30% chance that the plaintiff would require a

[63] *Schrump v Koot, supra* note 33 at 7.

surgery in the future owing to the tortious injuries, simple probability reasoning would provide the plaintiff with 30% of the total cost of the surgery.

In terms of the actual indemnification of the plaintiff, simple probability reasoning results in substantively inaccurate compensation: if, eventually, the future surgery is required, the plaintiff will have been undercompensated, because he would only have received 30% of its total cost. If the future surgery is not required, then the plaintiff will have received a windfall, because he had no expenditures related to the surgery, yet received 30% of its total value.

The idea that simple probability reasoning leads to substantively inaccurate outcomes was expressly acknowledged by the Supreme Court of Canada in the *Janiak v Ippolito*[64] decision, where simple probability reasoning was used in relation to mitigation of damages. There, the plaintiff had suffered a serious back injury after a motor vehicle accident. As a result of the accident, he was unable to work as a crane operator, as he had prior to the accident, and the compensation for his future loss of income was at issue. The evidence presented at trial suggested that doctors had recommended a spinal fusion, which, if undertaken, would provide a 70% chance of complete recovery. The plaintiff, however, refused to undergo the surgery. At trial, the reasonability of this refusal was at issue in relation to mitigation of damages. The plaintiff was denied recovery on the basis that he did not undergo surgery, which constituted a failure to mitigate.

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[64] *Janiak v Ippolito, supra* note 28.

The Court of Appeal agreed that damages awarded should be reduced based on the plaintiff's refusal to undergo the surgery, but the possibility that the surgery would not have been successful should have been taken into account as well. [65] Because the surgery held a 70% chance of recovery, there was a 30% likelihood that a recovery would not occur, and the plaintiff would not be able to return to work. Consequently, the Court of Appeal awarded 30% of the total lost earnings. In other words, rather than awarding nothing for lost earnings because it was found that the refusal of treatment was unreasonable, the Court took into account the likelihood that the act of mitigation (undergoing the surgery) would have been unsuccessful. The Supreme Court of Canada upheld the Court of Appeal's reasoning.[66]

At the Supreme Court level, the appellant submitted to the Court that because the respondent could change his mind about the surgery, he could be effectively over-compensated in the event that the surgery was successful, and he fully recovered.[67] The Court was not swayed by the argument and commented further that:

> As long as he is bona fide in his present claim that he does not intend to have the operation and is not taking a calculated risk that he will come out ahead by recovering 30% of his damages now and then later have the surgery with a 70% chance of complete recovery…there does not seem to me to be any problem arising from the fact that he might change his mind in the future and be overcompensated in the result…it should also be kept in mind that there exists a 30% possibility that he will be very substantially undercompensated.[68]

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[65] *Ippolito v Janiak* 34 OR (2d) 151, OJ No 3111 (OCA).
[66] *Janiak v Ippolito, supra* note 28.
[67] *Janiak v Ippolito*, *supra* note 28 at para 44.
[68] *Ibid*.

A similar acceptance of substantively inaccurate compensation based on simple probability based reasoning is found in the *Andrews* decision as well: "[t]his whole question of contingencies is fraught with difficulty, for it is in large measure pure speculation…To vary an award by the value of the chance that certain contingencies may occur is to assure either over-compensation or under-compensation, depending on whether or not the event occurs."[69] Even so, 20% deductions to account for potential contingencies in the future were upheld in *Andrews*, *Thornton* and *Teno*.[70]

Thus while simple probability reasoning provides a principled method of valuing a chance rather than requiring the proof of some future event, it also endorses the acceptance of substantive inaccuracy in terms of the monetary indemnification of the plaintiff. Moreover, using the simple probability principle does not change the reality of how speculative the valuation of a plaintiff's loss is. Therefore, the

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[69] *Andrews, supra* note 52 at 251.

[70] Contingency deductions are controversial, though it is outside of my scope to engage deeply with the controversy. My purpose is to illustrate the uncertainty associated with projection into the future, how uncertainties may lead to substantive inaccuracy, and that adjudicative decisions are still legitimate if made in accordance with legal procedures, including appropriate evidentiary principles. Part of the controversy associated with contingency deductions is that courts make deductions almost as a matter of course, without appropriate reliance on evidence. Indicating the impropriety of this, the Supreme Court of Canada in *Thornton, supra* note 52 at 284, commented that "the imposition of a contingency deduction is not mandatory, although it is sometimes treated almost as if it were to be imposed in every case as a matter of law. The deductions, if any, will depend upon the facts of the case…" As Cassells and Adjin-Tettey suggest in *Remedies, supra* note 4 at 143, despite these comments, courts seem to make contingency deductions almost automatically. The legitimacy of such deductions is likely questionable, because adjudicative decisions should occur on the basis of evidence presented by both sides, as opposed to judicial inklings.

question remains: in circumstances of uncertainty, which bring with them the risk (or in some cases the inevitability) of substantively inaccurate compensation, what is it that maintains the legitimacy of adjudicative outcomes?

3(d). Procedural Legitimacy at the Valuation Stage

The valuation of damages stage of injury litigation is an uncertain inquiry, and the resultant quantification of the plaintiff's loss bears the risk of substantive inaccuracy. Procedural legitimacy is the source of justification for this uncertain inquiry culminating in a final and binding determination of the plaintiff's legal entitlement. If the valuation decision is made in accordance with the guiding legal principles, and is made with procedural propriety, it is a legitimate adjudicative determination, even if it is substantively inaccurate.

In the damages context, the over-arching guiding principle is full compensation of the plaintiff - the court must inquire into the plaintiff's loss with a view to providing full compensation. In addition, being an adjudicative inquiry, in determining the valuation of the plaintiff's loss, the court must adhere to the general principles of adjudicative decision-making. This includes all the relevant procedural rules, including the trite principle of adversarial decision making that the decision must be based on the evidence presented by both sides, not the court's own conjecture. The commitment to both the full compensation principle and to proper adversarial decision-making is evident in the following comments from the Supreme Court of Canada:

> "The correct principle is proper compensation for the injuries suffered by the victim. The exact amount in any particular case must be determined

> from the evidence presented by the parties at trial. Fairness to the defendant is achieved not by a reduction for ability to pay, or by an arbitrary slashing of the award, but by assuring that the plaintiff's claims are legitimate and justifiable."[71]

Similarly, in response to an invitation to engage in some evidence-free speculation, Dickson J expressed commitment to the adversarial process and the importance of reliance on the evidence presented by both sides in arriving at an adjudicative conclusion, in the following words:

> Reference was made in the Court of Appeal, and in this Court, to the possibility of the appellant and two or three others in a similar situation pooling their resources and establishing a group home, reducing thereby the monthly cost of future care required by the appellant…With great respect, I can see little purpose in an appellate court conjuring up, of its own accord, possibilities which have not been mooted at trial, particularly when those possibilities find no support in the evidence either as to practicability or as to cost. In an adversary system it is the parties themselves, and not the court, who must come forward with claims for mitigation and with credible evidence to support those claims.[72]

In a similar vein, when the lower courts in *Andrews* and *Thornton* considered the defendant's ability to pay or the size of the award in and of itself in deciding on the appropriate standard of care that the plaintiffs were entitled to, they were found to be misguided for two inter-related reasons. First, those considerations were irrelevant to the principle of full compensation. Related, the appellate courts should have paid heed to the medical evidence presented at trial which was overwhelmingly clear that home care as opposed to institutional care was the medically preferable form of treatment for the plaintiffs.[73]

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[71] *Thornton*, *supra* note 52 at 279.
[72] *Ibid*, references removed.
[73] See *Thornton*, *supra* note 52 at 282 and *Andrews, supra* note 52 at 239-249.

In so holding, the Court affirmed that a plaintiff may not have any compensation she conjures up, and that the plaintiff's claim must be 'legitimate and justifiable'.[74] By holding that the claim to home care was appropriate, the Court implied that the legitimacy and justifiability of a plaintiff's claim are contingent on their adherence to guiding principles and their having an appropriate evidentiary basis. It would follow that if a Court adhered to these principles in evaluating the plaintiff's claim, the resultant adjudicative outcome would also be legitimate and justifiable – even if it were substantively inaccurate.

The sentiment that adherence to principle is the basis for determining the legitimacy of an adjudicative decision as opposed to factually accurate calculations was expressed by the Supreme Court of Canada in *Teno*. Having found that the trial judge had appropriately examined the evidence and accepted the calculations made by various witnesses as to the cost of care that should be awarded, Spence J stated:

> I stress that it is not my intention to question the arithmetical calculations made in the Courts below or to enter into discussions as to whether one attendant or two attendants are necessary or the length of work shifts but to devote myself to the issue of principle and I have no difficulty in accepting the judgment of the learned trial judge, confirmed in the Court of Appeal, that to give to the infant plaintiff the care which her conditions requires and will continue to require for the rest of her natural life will, until she reaches the age of 19 years, cost about $21,000 per year and thereafter about $27,000 per year.[75]

The Court's references to the importance of adherence to the general principle of full compensation and reliance on evidence presented by both sides, coupled with its recognition of the inevitability of substantive inaccuracy presented in the

[74] *Andrews*, *supra* note 52 at 245.
[75] *Teno, supra* note 52 at 322 [emphasis added].

previous section, provides a clear indication that given the conditions of uncertainty, proper adherence to principle and procedure cannot be compromised. The uncertain and speculative task at the valuation stage does not provide an escape from engaging in the valuation process. Nor is the uncertainty a justifiable excuse to make arbitrary or illegitimate decisions. Decisions that reflect considerations that are not relevant to the full compensation of the plaintiff, or which fail to make appropriate use of evidence that is presented in accordance with adversarial procedure are not legitimate – not because of substantive inaccuracy, but because the process of arriving at the legal determination was improper.

In a final illustration of the significance of adherence to principle and procedure at the valuation stage, consider the following example involving the use of simple probability reasoning. Suppose that a plaintiff alleges that his injury will necessitate a surgery in the future. The evidence indicates a 30% chance of requiring surgery in the future. However, the court misguides itself, and instead of applying simple probability reasoning and valuing the chance of the future surgery, the court applies the balance of probabilities standard of proof to the future surgery. The plaintiff was only able to establish a 30% likelihood, so she is awarded no compensation. Some time after the trial, it is discovered that the future surgery will not be required. This means that insofar as the actual indemnity of the plaintiff is concerned, the court's decision was substantively accurate (or at least closer to substantive accuracy than if 30% of the total assessed award for the surgery were awarded). Even so, the court's decision cannot be considered legitimate, because it

failed to apply the principle of simple probability, which allows for a valuation of a chance, rather than the future event itself.

Part 4. Conclusion

My goal in this chapter has been to demonstrate that procedural legitimacy is applicable at the damages stage of adjudicative decision-making, even though factual accuracy and substantive goals seem to drive adjudicative decision-making. My argument for procedural legitimacy is grounded in the conditions of uncertainty in which adjudicative decisions are made. I illustrated above that uncertainty prevents a guarantee of substantive inaccuracy whether the adjudicative decision concerns a liability determination or a quantification of damages. Consequently, the adjudicative process turns to consistency in procedure to ensure that the decisions it makes are legitimate, despite the risk that they may be factually inaccurate.

In order to demonstrate this at the damages context, I suggested that it is useful to understand the damages stage as having two phases. In phase one, the relevant facts must be established. In phase two, a valuation process takes place wherein the plaintiff's losses are quantified. The process of establishing legal facts is consistent between the two phases of analysis – legal facts are established on the basis of the balance of probabilities burden of proof, which contemplates the possibility of substantive inaccuracy. The valuation process at the damages stage is then undertaken on the basis of these legal facts, whether or not they correspond with factual reality. Therefore, in the same way as a liability determination is made on the basis of facts that may or may not be factually accurate, the determination of the

plaintiff's legal entitlement occurs on the basis of legal facts, which may or may not be factually accurate. That being the case, the propriety of either the liability determination or the valuation of the plaintiff's loss cannot be dependent on substantive accuracy, because these decisions are underpinned by legal facts, which may not be factually accurate, though still legitimate as *legal* facts. The adjudicative decisions are legitimate if they are made in accordance with the relevant rules of legal procedure.

As to the applicability of procedural legitimacy in the second damages phase, the valuation phase, the court's task is particularly uncertain. Here, the exercise projects into the future to determine the amount of the plaintiff's entitlement, asking highly speculative questions in doing so. The uncertainty of the inquiry, however, does not permit the inquiry itself to be shirked, and courts do arrive at a final dollar figure that represents the plaintiff's loss. As indicated in the Supreme Court's comments in the Trilogy cases, the most relevant consideration in whether an adjudicative decision is legitimate is not what the conclusion was (i.e. substantive accuracy) but how it was arrived at (i.e. procedural propriety).

In sum, I have demonstrated that the conditions of uncertainty necessitate that adjudicative decisions maintain procedural accuracy in order to be legitimate. What is certain is that the inquiry at the damages stage in injury litigation will be dependent on expert evidence, and particularly, medico-scientific evidence. As Kempt puts it, "the keystone for any personal injury case, apart form the plaintiff's

own evidence, is the medical evidence."[76] Determining what standard of care that is justifiable for the plaintiff, the prospects of recovery, the prognosis, the potential for future associated harms, the causal connection between the harm and the injury, are all inquiries that will depend on expert assistance. Given the significance of consistent adherence to procedure in maintaining the legitimacy of adjudicative outcomes, such evidence must be properly admitted and weighed throughout the adjudicative process so that the decisions that are made in reliance on such evidence maintain their legitimacy.

[76] Kemp, *Damages, supra* note 47.

Chapter 4: Application of Procedural Legitimacy to the Science and Law Interaction

Chapter overview

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- a. The Probative and Prejudicial Impacts of Scientific Evidence
- b. Re-visiting the Science and Law Solutions

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Part 3: Conclusion

Introduction

As I concluded in Chapter 2, *The Importance of Procedural Legitimacy in Law*, even though substantively accurate outcomes are optimal, procedural legitimacy cannot be ignored. The application of procedural legitimacy in the damages context in Chapter 3 gave credence to this conclusion, showing that procedural legitimacy is a thread that runs through the entire civil adjudication process. Given that uncertainty prevails throughout the litigation process, procedural legitimacy provides a way to assess the validity of adjudicative outcomes, be they pronouncements of liability or determinations of damages entitlements. Substantive accuracy, or factual accuracy alone cannot be determinative of the validity of an adjudicative outcome, because the legal system cannot guarantee

substantive or factual accuracy. This is inherent in the way that legal facts are proven – on a standard of proof of that is less than certainty. Because this method of proving legal facts underlies the entire civil adjudication process, legal outcomes, whether liability or damages determinations, are not *certainly* factually accurate. Still, liability and damages determinations can be considered valid, despite the chance that they are factually inaccurate, as long as they are made through proper application of legal procedure.

The previous two chapters have demonstrated that consistent application of legal procedure is a lynchpin of legitimate adjudication. This conclusion validates my claim that procedural legitimacy must not be understated in the science and law discussion, as I had introduced in Chapter 1, *Setting the Science and Law Stage*. Even where scientific evidence is necessary to the litigation, consistent adherence to legal procedure must be maintained in order to ensure legitimate results. I turn now to applying the argument of procedural legitimacy to the specific concerns that accompany scientific evidence, which I canvassed in Chapter 1. My focus in this chapter is to determine how the adjudicative process should accept and use scientific evidence, acknowledging both its benefits and potential prejudicial impact, while upholding the principle of procedural legitimacy established in the previous two chapters.

In Part 1 of this chapter, I will recap the concerns of the science and law discussion that were catalogued in *Chapter 1: Setting the Science and Law Stage*. This recap will

reorient my discussion back towards science and law issues. In Part 2, I will apply the concept of procedural legitimacy to the science and law discussion. Within this application, I frame the science and law discussion in a way that avoids over-emphasizing substantive accuracy and under-emphasizing procedural legitimacy. This framing will not devalue the substantive concerns that have tended to drive the science and law discussion, but will add the necessary dimension that procedural legitimacy provides. Adding this dimension is necessary in order to maintain the legitimacy of the legal system and acceptable adjudicative results, while tackling the science and law concerns. My application of procedural legitimacy to the science and law discussion will conclude by demonstrating how the recommendations of the Goudge Inquiry, with some additions, address the science and law concerns, and maintain the procedural integrity of the legal system.

Part 1*: Revisiting the Science and Law Concerns

1(a). The Probative and Prejudicial Impacts of Scientific Evidence

Science can be both probative and prejudicial. The task is to find a balance that ensures that the legal process retains access to probative science, while avoiding its prejudicial impact. Finding an appropriate balance is contingent on appreciating how and why scientific evidence is probative for legal fact-finding, and what gives rise to its potential prejudicial impact.

Science is probative because it can provide information that will assist the court to determine if a legal fact has been established to the requisite standard of proof. For instance, in the personal injury cases discussed in Chapter 2, scientific medical

evidence was useful in determining if the causal link between the act of negligence and the plaintiff's injury was established. And as discussed in Chapter 3, medical information is useful in determining the plaintiff's compensable loss, because the court must determine which harms are attributable to the injury sustained. Medical/scientific information is undoubtedly useful to these legally relevant inquiries. But the same scientific evidence also has a propensity to distort the fact-finding process.

The potential of science to distort legal fact-finding arises out of two types of deference. First, the expert's credentials may draw deference from triers of fact. Second, the natural 'impressiveness' that comes with scientific (or scientific sounding) evidence, could lead lay triers of fact to over-rely on such evidence, without subjecting it to proper (or any) scrutiny. Justice Sopinka summed up these concerns in *R v Mohan:*

> There is a danger that expert evidence will be misused and will distort the fact-finding process. Dressed up in scientific language which the jury does not easily understand and submitted through a witness of impressive antecedents, this evidence is apt to be accepted by the jury as being virtually infallible and as having more weight than it deserves.[1]

The prejudicial impacts of deference to scientific evidence are amplified by a general lack of scientific literacy among legal actors, making it difficult to meaningfully evaluate scientific evidence. Augmenting this issue, scientific experts may misunderstand their role in the legal process, and improperly presume that they

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* This Part provides a brief overview of the science and law concerns that were presented in Chapter 1: *Setting the Science and Law Stage*, Parts 2, 3 and 4.
[1] *R v Mohan* [1994] 2 SCR 9, SCJ no 36 (QL) at 19 [*Mohan*].

should act as advocates for the party that hires them.[2] This results in impressive-sounding scientific testimony being presented by an expert whose aim is to campaign his or her opinion, rather than to facilitate the understanding of the lay trier of fact. These circumstances make it difficult to scrutinize scientific evidence, leaving triers of fact to weigh evidence based on a witness' credentials and demeanor, rather than on the reliability of the evidence they present.

1(b). Re-visiting the science and law solutions

Discussions about how science and law should interact are mostly situated within the law of admissibility of expert evidence, under the pretense that if 'bad' science can be caught at the admissibility stage, then the potential sullying effects of science on the trial process can be avoided. Courts and scholars have experimented with incorporating scientific factors into admissibility of evidence criteria, which I have previously suggested displays a preference for scientific reasoning.[3] Along with alterations to admissibility criteria, more novel methods of admitting scientific evidence have also been suggested, such as increasing the use of court appointed experts or joint experts, in order to reduce the impact of adversarialism on scientific evidence. Alterations to admissibility criteria, and suggestions to admit scientific evidence through non-traditional methods are aimed at ensuring that the scientific evidence that will be relied on in the trial process is "good science."

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[2] This problem was made clear in the Goudge Inquiry, where Dr. Charles Smith revealed that he understood his role as that of an advocate for the prosecution, Ontario, Report of the Inquiry into Pediatric Forensic Pathology in Ontario (Toronto: Queen's Printer, 2008) (Chair: Stephen T Goudge) at 503 [Goudge Inquiry].

[3] See Chapter 1, *Setting the Science and Law Stage*, Part 3(b).

Although the attempts to ensure that the triers of fact are presented with legitimate evidence are worthy, the effort to 'get the science right' can only be a partial solution. It does not account for the tendency to rely too heavily on scientific evidence, which can itself distort the fact-finding process, even if the science presented is demonstrably 'good' or reliable. As explained in the personal injury cases discussed in Chapter 2, it is improper to equate scientific/medical uncertainty regarding factual causation with an inability to prove factual causation in law. This would effectively allow scientific evidence to usurp the process of legal fact-finding, because legal facts must be proven on the balance of probabilities standard, which contemplates uncertainty. Scientific certainty is not required to establish legal facts on the balance of probabilities.[4] These cases provide a telling example of how deferring to scientific evidence, even if it is good science, can be prejudicial to the operation of the justice system: too much weight given to scientific evidence can distort the legal standard of proof, which is at the heart of proper legal fact-finding. If legal facts are not found with procedural propriety, they cannot be legitimate legal facts.

The impact of over-reliance on science on legitimate legal fact-finding is susceptible to under-appreciation when substantive or factual accuracy is over-emphasized, and science is understood to be a mechanism for attaining factual accuracy[5]. But where the impact of scientific evidence on the procedures of fact-finding is not addressed, the legitimacy of the adjudicative system is at stake. I approach the science and law

[4] See Chapter 2, *The Significance of Procedural Legitimacy in Law*, Part 2.
[5] See Chapter 1, *Setting the Science and Law Stage*, Part 4.

interaction without under-emphasizing the importance of maintaining procedural propriety. After all, the concern with deference to scientific evidence, as presented by Sopinka J in *Mohan,* was that it could cause a distortion to the fact-finding *process*. This concern should be appropriately reflected in the solution to the science and law interaction, and I demonstrate how this can be accomplished in Part 2 below, which ends with an endorsement of the Goudge Report recommendations.

Part 2: Procedural Legitimacy Applied to Science and Law

2(a). Framing the Science and Law Discussion within Procedural Legitimacy

Recall that the procedural legitimacy argument maintains that legitimate adjudicative decisions are achieved when the fact-finding procedure is adhered to, and the law is applied properly to those legal facts. Applying substantive tort law principles to the legal facts that are properly established at trial results in a legitimate determination of liability. Similarly, the legal determination of the plaintiff's compensation is legitimate when the legal facts relevant to defining the compensable loss are appropriately established, and the full compensation principle (and any other substantive principle of quantifying damages) is then applied. Legal determinations of either liability or quantification of damages occur on the basis of legal facts, and the litigants' rights and obligations are thereby defined. Maintaining legitimate adjudicative outcomes is therefore incumbent on proper adherence to the procedures of fact-finding, in order to ensure that the law is applied to legitimate legal facts.

To find legal facts, the triers of fact must be presented with evidence. The first procedural element of fact-finding is determining the admissibility of evidence, to ensure that it is properly before the court. Once properly admitted evidence is presented at trial, arguments are made as to how much weight should be given to the evidence. After hearing arguments, the trier of fact must consider all the evidence and determine whether the appropriate party has satisfied its requisite standard of proof, and has established the necessary legal facts. If appropriately admitted evidence is properly weighed against the relevant standard of proof, the facts found are legitimate.

In the context of science and law, this means that the admissibility of evidence rules must be appropriately applied to scientific evidence so that the evidence presented is properly before the court. Ensuring that scientific evidence is properly admissible requires an application of the four-part test from *Mohan* for the admissibility of expert evidence. To recap, the criteria are:[6]

1. The expert's opinion must be both logically relevant and legally relevant. Logical relevance means that evidence would tend to prove a fact at issue. Legal relevance means that the probative value of the expert's opinion must outweigh any prejudicial impact it may have.

2. The expert's testimony must be necessary to the trier of fact (i.e. outside of the scope of a layman's knowledge).

3. The expert must be qualified to present the opinions he or she gives.

4. No other rule must be applicable to exclude the expert's evidence. For instance, an expert cannot be permitted to enter privileged evidence, or

[6] *Mohan, supra* note 2 at paras 17-28.

> hearsay evidence, because these types of evidence are inadmissible under other evidentiary rules.

If these admissibility rules are not applied properly to scientific evidence, it means that the trier of fact is not measuring appropriate evidence to the standard of proof, and the legitimacy of the resultant adjudicative decision is questionable. As the procedural rules upon which legal fact-finding occurs, the governing law of evidence must be applied consistently and appropriately to scientific evidence, to ensure the procedural propriety and, therefore, the legitimacy of legal fact-finding. The appropriate solution to the challenges posed by the science and law interaction must address how the admissibility rules can be properly applied to scientific evidence, without allowing deference to scientific experts or scientific evidence. To ensure that admitted scientific evidence, along with all the other evidence presented at trial, is measured to the appropriate standard of proof to find legitimate legal facts, in keeping with procedural propriety, deference to scientific evidence must be avoided so that it is not given undue weight. The fact-finder must appropriately understand the standard of proof, and be aware that requiring scientific precision in order to establish legal facts is procedurally erroneous. This is an emphasis in *Snell*, and is reaffirmed in subsequent Supreme Court of Canada Cases, most recently in *Clements*[7]. The most appropriate solution to the science and law dilemma must consider ways to ensure that scientific evidence is weighed properly, rather than being given undue weight and prejudicial impact.

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* An earlier version of this section appeared in "Law's Treatment of Science: From Idealization to Understanding," submitted for course credit in Science and Law, Fall Term, 2011-12

[7] See Chapter 2, The Significance of Procedural Legitimacy, Part 2(a).

The Report of the Goudge Inquiry[8] provides a useful guide to utilizing science appropriately without under-emphasizing the legitimacy of legal decision-making. The recommendations provided in the Report are a balanced recognition of the probative but also prejudicial impact of scientific evidence. In the upcoming section, I endorse the recommendations on the basis that they address the science and law concerns in a manner that is consistent with procedural legitimacy.

*2(b). The Goudge Inquiry Recommendations and Procedural Legitimacy.**

The Goudge Inquiry was convened to investigate the wrongful convictions that occurred in relation to suspicious deaths of children in Ontario. Noting that forensic pathologist, Dr. Charles Smith, had provided expert testimony in many of the cases that were found to contain miscarriages of justice, the Goudge Inquiry Report includes a chapter devoted to "how the legal system can regulate the behavior of expert witnesses and, in particular, the vital gatekeeping role of trial judges."[9]

The Report highlighted two major areas that judges should be particularly mindful of while gate-keeping at the admissibility stage. First, judges are called on to clearly and precisely define the scope of the witnesses' expertise, and to police the boundaries of the expertise during the expert's testimony.[10] Second, judges must

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* An earlier version of this section appeared in "Law's Treatment of Science: From Idealization to Understanding," submitted for course credit in Science and Law, Fall Term, 2011-12.

[8] Goudge Inquiry, *supra* note 2.

[9] *Ibid* at 471.

[10] *Ibid*, generally, and see specifically 471-475.

assess threshold reliability for all expert evidence at the admissibility stage.[11] Carefully considering the scope of expertise as well as undertaking threshold reliability analyses are squarely grounded in the *Mohan* test for admissibility of expert evidence.

The Report of the Goudge Inquiry includes tips and tools for gate-keeping judges to assist them in defining the scope of the witness' expertise and the reliability of scientific evidence, serving to enhance the application of the existing admissibility rules to scientific evidence, rather than manipulating the rules in order to better accommodate scientific evidence. Further, the Inquiry considers the provision of codes of conduct for experts, and the use of court appointed or joint experts where scientific evidence is being presented. The conclusions on these topics are consistent with procedural legitimacy, as I explain below.

2(b)(i). Defining Scope of Expertise at the Admissibility Stage

Goudge J's study revealed that on numerous occasions, Dr. Smith had been permitted to give opinions well beyond the scope of his expertise,[12] prompting the recommendation that scope of expertise should be carefully scrutinized and defined at the admissibility stage, and diligently policed thereafter. This recommendation is entirely consistent with the 4-part *Mohan* analysis. When experts give opinions beyond their expertise, they violate the qualification requirement, as well as the general exclusionary rule prohibiting lay witnesses from tendering opinion evidence. Moreover, if experts testify beyond their scope of expertise, the testimony

[11] *Ibid*, generally, and see specifically 477-480.
[12] *Ibid*.

becomes particularly prejudicial because the unqualified opinion could be given excessive weight due to the erroneous assumption of expertise. As Sopinka J apprehensively commented in *Mohan,* "impressive antecedents" can improperly sway juries; it is all the more prejudicial when the impressive antecedents do not relate to the opinion tendered.

Entertaining an alternative solution, Goudge J considers the appropriateness of relying on instructions to the jury to give less weight to evidence that is beyond the scope of the witness' expertise. Noting that it is very difficult for juries to "tune out" evidence they heard at trial when coming to their decision, Goudge J concludes that front-end gatekeeping in respect of scope of expertise is more desirable than relying on jury charges after the fact.[13] Not only is this a justifiable conclusion; it is critical, based on the principle of procedural legitimacy.

An expert who tenders an opinion beyond the scope of her expertise constitutes a lay witness who tenders opinion evidence. The result is a violation of the *Mohan* criteria for admissibility of expert testimony, and of the general rule that opinion evidence is inadmissible. Neither the *Mohan* analysis nor the general rule of exclusion of opinion evidence require that the trier of fact give less weight to opinion evidence; they require that opinion evidence does not come before the trier of fact at all (i.e. lay opinions are inadmissible evidence). If evidence that violates

[13] *Ibid* at 474. In noting the jury's difficulty in tuning out evidence heard at trial, Goudge J refers to the comments of Professor Erica Beecher-Monas and Professor Gary Edmond, both of whom expressed this sentiment during the course of the inquiry.

admissibility rules is admitted, the validity of the resulting adjudicative decision is questionable due to a procedural impropriety, whether or not juries are later instructed to give less weight to the evidence. Consequently, an adjudicative decision that is based on the testimony of an expert that was given beyond the scope of her expertise could be invalid because such evidence should never have been presented to the jury. Front-end gatekeeping in respect of scope of expertise is a sound and useful recommendation.

Goudge J's conclusion that scope of expertise, being an issue of admissibility, requires vigilant front-end gate-keeping bears in mind the potential for prejudice that science brings with it (i.e. the potential for distorting fact-finding due to presentation by distinguished experts). It is also consistent with procedural legitimacy, as failing to define scope of expertise at the admissibility stage would violate the *Mohan* analysis for admissibility of expert evidence, as well as the general rule prohibiting admission of the opinion evidence of lay witnesses.

2(b)(ii). Determining Threshold Reliability: Avoiding Deference to Science

Calling on judges to assess the threshold reliability of expert evidence at the admissibility stage, Goudge J demonstrates that such an approach is implied throughout the *Mohan* analysis.[14] Threshold reliability is relevant to weighing probative value against prejudicial effect of evidence, as unreliable evidence is less probative and more prejudicial. Thus, balancing probative value against prejudicial effect is required when determining whether evidence has legal relevance under the

[14] Goudge Inquiry, *Ibid* at 477-480.

Mohan analysis. Similarly, if the prejudicial effect of evidence outweighs its probative value, the evidence can be excluded for that reason alone, as this is a stand alone exclusionary rule. As such, determining threshold reliability is relevant to whether "any other exclusionary rule applies." Third, threshold reliability is relevant to the necessity requirement, as evidence that does not meet a threshold level of reliability cannot be said to be of assistance to the trier of fact.[15]

Goudge J thus demonstrates that threshold reliability is an essential component of the *Mohan* analysis. That being the case, the existing admissibility rules are not compromised by Goudge J's urging that judges assess threshold reliability carefully when determining admissibility of evidence. Instead, this recommendation enhances the application of the *Mohan* analysis because it serves as a reminder that threshold reliability is relevant at the various stages of admissibility analysis. Goudge J provides a number of related recommendations designed to assist judges with determining threshold reliability of scientific evidence. These recommendations too serve to make the *Mohan* analysis more employable, and pertinent to scientific evidence.

Commenting on what tools judges might use to assist them in determining threshold reliability, Goudge J endorses the view that the *Daubert* factors can have the beneficial effect of ensuring that expert evidence adheres to a "scientific method that emphasizes testing and peer review and that is conscious of known or potential

[15] *Ibid*.

error rates, as a means of attempting to ensure the reliability of expert evidence."[16] However, Goudge J is careful to acknowledge that many types of expert evidence may not be amenable to empirical analysis: "Testing and error rates are optimal, but it is important to reiterate that many kinds of expert opinion are not readily susceptible to empirical testing or reproducibility. The inability to provide testing results does not necessarily render these kinds of expert evidence unreliable."[17]

The Ontario Court of Appeal decision *R v Abbey*[18] illustrates this insight. The accused was a member of a gang. The Crown's theory was that he had murdered the victim, Simeon Peter, believing him to be part of a rival gang. At the time of trial, the accused had a teardrop tattoo. The Crown called on a sociologist with expertise in North American gangs to testify as to the potential meanings of teardrop tattoos among gang members. The sociologist testified that, among other things, a teardrop tattoo could mean that the gang member had murdered a rival gang member. Applying the *Daubert* criteria, the trial judge found the sociologist's evidence unreliable, and found it inadmissible.[19] The accused was acquitted at trial, and the Crown appealed the acquittal.

The Ontario Court of Appeal quashed the acquittal and ordered a new trial on the basis that the trial judge misapplied admissibility rules to exclude the sociologist's evidence. The Court of Appeal found that it was improper for the trial judge to rely

[16] *Ibid* at 481.
[17] *Ibid* at 492.
[18] *R v Abbey* 2009 ONCA 624, OJ No 3534 [*Abbey*]
[19] *Ibid* at paras 104-107.

on the science-based *Daubert* factors to determine admissibility in this case, holding that the sociologist "did not pretend to employ the scientific method and did not depend on adherence to that methodology for the validity of his conclusions." [20] Cautioning against a rigid application of scientific criteria to determine admissibility of expert evidence, the Ontario Court of Appeal explained that doing so would cause "much of the expert evidence routinely accepted and acted upon in courts [to] be excluded despite its obvious reliability and value to the trial process."[21]

Approaching scientific admissibility criteria with the same caution, Goudge J's recommendations suggest that while scientific ideals (which the *Daubert* factors embody) may be useful to assess the threshold reliability of some expert evidence, they should not be over-applied. Depending on scientific reliability factors to determine admissibility for all types of evidence could result in improperly excluding evidence that the trier of fact should have relied on to assess whether the standard of proof had been met. This could constitute an invalid legal outcome, as demonstrated by the Ontario Court of Appeal's decision to order a new trial in *Abbey*.

Along with his general comments on the *Daubert* criteria and their role in assessing threshold reliability, Goudge J provides a list of factors relevant to determining threshold reliability. The list recommends considering the scientific reliability of a theory or technique that an expert opinion is grounded on. Questions to ask in this

[20] *Ibid* at 108.
[21] *Ibid* at 110.

respect include: "whether [the scientific theory or technique] is generally accepted; whether there are meaningful peer review, professional standards, and quality assurance processes; and whether the expert can relate his or her particular opinion in the case to a theory or technique that has been or can be tested, including substitutes for testing that are tailored to the particular discipline."[22] Similar to his general comments relating to the *Daubert* criteria, these factors demonstrate Goudge J's appreciation that scientific reliability can be a relevant consideration in determining threshold reliability, but that scientific methods may not be applicable to all evidence, and should not be applied without discerning whether the evidence is amenable to scientific testing.

Goudge J's recommendations thus allow for the use of scientific criteria within the legal determination of threshold reliability, but refrain from idealizing scientific reliability such that it replaces the legal concept of threshold reliability. As such, while the utility of scientific reliability is not wholly ignored, law's own procedural rules are uncompromised. This commitment to the legal system's procedures is additionally apparent in Goudge J's reminder that the trial judge's role is to determine *threshold* reliability – the trial judge does not need to be convinced of the *ultimate* reliability of the evidence at the admissibility stage.[23]

[22] Goudge Inquiry, *supra* note 2 at 495.
[23] *Ibid*.

2(b)(iii). Threshold vs. Ultimate Reliability: Maintaining Procedural Legitimacy

Goudge J's additional factors for consideration reflect his cognizance of the important distinction between threshold reliability and ultimate reliability. This is because they take into account the second stage of evidentiary analysis where the trier of fact assigns weight to evidence, and considers the ultimate reliability of the evidence:

> [W]hether there is a serious dispute or uncertainty about the science and, if so, whether the trier of fact will be reliably informed about the existence of that uncertainty"
> …
> [W]hether experts can express the opinion in a manner such that the trier of fact will be able to reach an independent opinion as to the reliability of the expert opinion." [24]

These factors contain the implicit recognition that at the admissibility stage, trial judges should examine the admissibility of evidence, bearing in mind that the trier of fact is yet to assign weight to the evidence; in other words, the evidentiary analysis is not over at the admissibility stage. Rather than determining admissibility entirely on the basis of reliability, Goudge J suggests that judges consider whether the trier of fact will be able to appropriately weigh the evidence when determining admissibility. What this recognizes is that, considerations at the admissibility stage are designed to ensure that the trier of fact receives appropriate evidence, which is then weighed against the relevant burden of proof and come to some substantive decision in accordance with adjudicative procedure.

[24] *Ibid* at 495 [emphasis added].

Evidence that attains a threshold level of reliability should be presented to the trier of fact, who will then determine ultimate reliability when the evidence is weighed to make a substantive decision. As such, it would be inappropriate for the trial judge to make a judgment about the ultimate reliability of evidence at the admissibility stage. To do so would ignore the fact that evidence that attains threshold reliability (along with satisfying the other *Mohan* criteria) is appropriate for the trier of fact to receive, weigh and use in order to make the substantive decision. While it is appropriate for the trial judge to consider whether the trier of fact will be informed of uncertainties in evidence, the trial judge does not have to solve these uncertainties. In accordance with a proper application of admissibility rules, that task must be left to the trier of fact at the weighing of evidence stage.

In that light, it would be inappropriate for the trial judge to want to be convinced of the scientific reliability of the evidence at the admissibility stage, because such a standard exceeds the threshold reliability that the judge is charged to determine. Scientific reliability may become more strenuously applicable at trial, as counsel attempts to convince juries of the amount of weight to apply to scientific evidence. Still, even when ultimate reliability is being assessed, scientific reasoning must not usurp legal reasoning. A strict reliance on science-based factors to answer legal questions is an inappropriate utilization of science in the legal process.[25]

[25] See also Chapter 1, *Setting the Science and Law Stage*, Part 3(2).

In an effort to avoid over-reliance on scientific paradigms to make legal determinations in cases where significant scientific evidence is tendered, jury charges could include a reminder of the difference between scientific and legal proofs. Goudge J endorses the use of model jury charges published by the Canadian Judicial Council "in cases where expert evidence is important."[26] The model jury charges include mid-trial instructions, which judges can use immediately prior to an expert's testimony, and final charges, to be used at the conclusion of the trial. The mid-trial instructions suggest that judges start by explaining that generally, witness are not permitted to give opinions as evidence, but in the case of experts, this rule does not apply.[27] Jurors should then be advised that it is up to them to determine how much to rely on the expert's opinion. To do so, they can consider: the expert's qualifications and experience; the reasons for giving the opinion; whether the methods used are suitable; whether the expert is impartial; and the rest of the evidence presented.[28] In the final instructions, along with reminding the jury of the same considerations noted above that can help jurors assign weight to an expert's opinion, the model charge includes the advice to the jury that "the opinions of experts are just like the testimony of any other witness. Just because an expert has given an opinion does not require you to accept it. You may give the opinion as much or as little weight as you think it deserves."[29]

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[26] Goudge Inquiry, *supra* note 3, Recommendation 140 at 513.
[27] Model Jury Instructions – Instruction 7.18, Expert Opinion, online: Canadian Judicial Council <http://www.cjcccm.gc.ca/english/lawyers_en.asp?selMenu=lawyers_pmf_types > [Canadian Judicial Council Model Jury Charges]
[28] *Ibid*, Instruction 7.18(2).
[29] *Ibid*, Instruction 10.3(2), Expert Opinion Evidence.

Ensuring that jurors know that they are not obligated to accept expert evidence, and that they must decide how much to rely on it in making their factual findings, would be useful where scientific experts are presented. Similarly, the guidance provided for how to weigh expert evidence may also be useful for scientific expert evidence. As noted, deference is a major contributing factor to the fact-finding distortion that scientific evidence can cause. The Canadian Judicial Council's model jury charges can be a useful safeguard to help prevent triers of fact from deferring to scientific opinions without duly scrutinizing the expert's qualifications, and his or her opinions. Goudge J's endorsement of these model charges in the context of scientific evidence is fitting.

Goudge J additionally suggests that where appropriate, judges could provide "structured questions to assist the jury in determining ultimate reliability,"[30] similar to the questions that the trial judge would have asked at the admissibility stage. The recommendations further provide that judges should remind jurors to use their common sense to decide whether to accept all, some or any of an expert's testimony.[31] I generally agree with these suggestions. However, asking jurors to use common sense may not be enough of a safeguard to prevent their over-reliance on science.

[30] Goudge Inquiry, *supra* note 3, Recommendation 140(3) at 513.
[31] *Ibid* at 511-513.

The Supreme Court of Canada in *R v Lifchus*[32] made some apt remarks about instructing juries to use common sense when applying the criminal standard of proof beyond a reasonable doubt. In that case, the accused was tried by judge and jury. The Jury convicted the accused, and he appealed on the basis that the trial judge had not properly instructed the jury as to the meaning of 'proof beyond a reasonable doubt.' In her charge to the jury, the trial judge said:

> When I use the words "proof beyond a reasonable doubt", I use those words in their ordinary, natural every day sense. There isn't one of you who hasn't said, gosh I've got a doubt about such and so. Perfectly every day word. There isn't one of you who doesn't have a notion of reasonable. That, too, is a perfectly ordinary concept.[33]

The Supreme Court of Canada found that the trial judge's explanation of 'proof beyond a reasonable doubt' was inadequate, and advised that a common sense approach to applying the fundamental concept of the standard of proof can compromise the fairness of a trial:

> A fair trial must be the goal of criminal justice. There cannot be a fair trial if jurors do not clearly understand the basic and fundamentally important concept of the standard of proof that the Crown must meet in order to obtain a conviction.[34]

And later:

> The phrase "beyond a reasonable doubt", is composed of words which are commonly used in everyday speech. Yet, these words have a specific meaning in the legal context. This special meaning of the words "reasonable doubt" may not correspond precisely to the meaning ordinarily attributed to them. In criminal proceedings, where the liberty of the subject is at stake, it is of fundamental importance that jurors fully understand the nature of the burden of proof that the law requires them to apply.[35]

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[32] *R v Lifchus* [1997] 3 SCR 320, SCJ no 77 (QL) [*Lifchus*].
[33] *Ibid* at 4.
[34] *Lifchus*, *supra* note 32 at 13.
[35] *Lifchus*, *supra* note 32 at 22.

The Supreme Court's comments in *Lifchus* suggest that instructing jurors to use common sense when weighing scientific evidence should be undertaken with caution, because over-reliance on scientific evidence can have the serious consequence of mis-application of the standard of proof.[36] In order to apply the standard of proof appropriately, jurors must be aware of the difference between legal proof and scientific proof. Given that different standards of proof among different fields of inquiry may not be a concept that is within the everyday knowledge of laypersons, advising jurors to use common sense in assessing scientific evidence is unlikely to provide enough of a safeguard against deferring to scientific evidence in the process of finding legal facts. Considering that appropriate application of the legal standard of proof is fundamental to legitimate legal decisions, jury charges ought to be explicit that applying the evidence presented at trial to the relevant standard of proof proves a legal "fact," and arriving at a legal "fact" is not a scientific inquiry, and does not require scientific proof.

2(b)(iv). Utility of the Adversarial Process

Drawing a distinction between threshold and ultimate reliability contains the implicit acknowledgement that evidence that meets a threshold level of reliability is yet to undergo the scrutiny of the adversarial procedure, where ultimate reliability can be more fully explored. This reflects Goudge J's assurance that the adversarial process is a legitimate and useful one for determining ultimate reliability.

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[36] Recall my discussion in Chapter 2, *The Significance of Procedural Legitimacy in Law*, Part 2, where I discuss the medical malpractice cases that indicate that over-reliance on scientific evidence as to causation can cause a misapplication of the standard of proof.

Goudge J's commitment to the utility of the adversarial process is more expressly evident in his discussion of court-appointed experts or joint experts. Though these alternate methods of presenting expert evidence have been recommended from time to time[37], and are available in some jurisdictions,[38, 39] the Goudge Inquiry does not recommend these solutions, suggesting instead that "one of the benefits of an adversarial system is its ability, through properly resourced and informed cross-examination and presentation of evidence, to best reveal and illuminate areas of scientific controversy."[40] He recommends, therefore, the effective use of the adversarial process, rather than painting it as the flaw that causes science to get distorted when the two fields interact. And, in an effort to maintain and enhance the utility of the adversarial process, Goudge J recommends that a trial judge ought to ensure that existing disclosure provisions are complied with so that the

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[37] See for example, Hon. Justice Thomas A. Cromwell commented in "The Challenges of Scientific Evidence" (McFayden Lecture, Memorial Series, sponsored by the Scottish Council of Law Reporting, delivered at the Royal Society of Edinburgh, March 2, 2011), online: <http://www.scottishlawreports.org.uk/publications/macfadyen-2011.html>[Cromwell Lecture]; Justice Ian Binnie, "Science in the Courtroom: The Mouse that Roared"(2007) 56 UNB LJ 307 [Binnie, Science in the Court Room]; Paul Michell and Renu Mandhane, "The Uncertain Duty of the Expert Witness" (2005) 42 Alta. L. Rev. 635 [Michell and Mandhane] at 660-673, and see my discussion in Chapter 1, *Setting the Science and Law Stage*, Part 3.

[38] *The Alberta Rules of Court*, r 6.40; *The British Columbia Supreme Court Civil Rules*, r 11-5; *Ontario Rules of Civil Procedure*, r 52.03; and *Nova Scotia Civil Procedure Rules*, r 55.12, for example, allow for court appointed experts.

[39] *The Federal Court Rules*, r 52.1(2); *British Columbia Supreme Court Civil Rules*, r 11-3; and *Nova Scotia Civil Rules of Procedure* r 55.07, for example allow joint experts to be named by adverse parties.

[40] Goudge Inquiry, *supra* note 2 at 506.

adversarial process can operate ideally, "ensuring that all parties are fully prepared and informed, and, as a result, can effectively test the expert testimony presented."[41]

Related to pre-trial preparations that can facilitate the trial process, Goudge J advises that judges can encourage meetings between willing experts prior to trial to define or narrow the differences among them. He does not, however, recommend that judges be given the authority to direct adverse experts to engage in such meetings, because such an approach may be subject to *Charter* objections.[42] His recommendations, therefore, do not require that experts meet before trial, but provide that they may be encouraged as a useful pre-trial procedure, should parties desire them.[43] Again, this recommendation is consistent with Goudge J's commitment to an effective adversarial process: it does not call for any drastic change in existing procedures, but encourages ways to facilitate an efficient trial.

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[41] *Ibid* at 508.

[42] Goudge Inquiry, *supra* note 2, 510-511. See also Goudge Inquiry, Chapter 17, The Role of Coroners, Police, Crown and, Defence, where pre-trial mandatory disclosure of defence expert reports, and the associated potential charter challenges are discussed.

[43] Goudge Inquiry, *supra* note 2, Recommendation 139 at 511. Goudge J refers to these meetings as "Hot Tubs" between experts. The term "hot-tubbing" is also used as a way to describe a method of presenting experts coined in Australia, where experts testify in panels instead of individually. This approach is not explored in the Goudge Inquiry, and it is outside of my scope to discuss the specific merits and pitfalls of hot-tubbing experts, because my focus is to consider way to ensure that existing procedures are applied vigilantly to scientific evidence. For discussions about the "Hot Tubbing" approach, see for example: Gary Edmond, "Merton and the Hot Tub: Scientific Conventions and Expert Evidence in Australian Civil Procedure" (2009) 72 Law and Contemp Probs 159; Judy Van Rhijn, "Hot-Tubbing Experts – Should Lawyers Like it?" (2011) 35.7 Canadian Lawyer 43; Elizabeth Reifert, "Getting into the Hot Tub: How the United States Could benefit from Australia's Concept of Hot Tubbing Expert Witnesses" (2011) 89 U Det Mercy L Rev 103.

2(b)(v). Recommendation Regarding Education

Cognizant of the heavy burden that his recommendations place on trial judges, both in defining the scope of an expert's testimony and determining threshold reliability, Goudge J acknowledges that their continued education is vital to his recommendations being successful.[44] I would add that if cross-examination is to be understood as a useful means of illuminating scientific controversy, then lawyers' continued education is necessary as well. Experts being questioned by lawyers who have a limited understanding of the expert's field may distort the evidence due to the lawyer's ignorance of that expert's field. Coupled with lawyers' aptitude for cross-examination tactics, an expert can be made to appear less credible to laypersons, while the evidence itself is simply misunderstood.

Binnie J, formerly of the SCC, has also recommended improving scientific literacy among judges and lawyers, commenting that the ability of trial judges to play the gate-keeping role assigned to them would require them to have some level of scientific aptitude.[45] Binnie J approvingly refers to the efforts of the National Judicial Institute in "bringing groups of Canadian Judges together to explore

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[44] In order to play their role of vigilant gate-keepers, Goudge J recommends that while judges cannot be expected to resolve scientific controversies, they can "learn to understand what constitutes good and bad science...and the frailties and limits of science" (Goudge Inquiry, *supra* note 2 at 500). He recommends the National Judicial Institute to consider developing additional programs for judicial education on scientific reliability and scientific method, and for the Canadian Judicial Council to prepare a Canadian equivalent to the US Federal Judicial Center, *Reference Manual on Scientific Evidence*, 3d ed (Washington: National Academic Press, 2011) online: National Judicial Center <http://www.fjc.gov/library/fjc_catalog.nsf>

[45] Binnie, Science in the Courtroom, *supra* note 37 at 11 [Binnie, Science in the Courtroom].

scientific concepts and subjects that may give rise to litigation."[46] Commenting that engaging in scientific education at an earlier stage would be beneficial, Binnie J optimistically refers to the Law and Technology course offered at Dalhousie Law School, and a course in the Universite de Montreal which teaches students about scientific proof. Notably, in 2011/2012, the Schulich School of Law at Dalhousie University introduced a course entitled "Science and Law" into its optional curriculum.[47] The course presents students with issues that arise when science and law interact. Such a course may be useful in bringing to light the susceptibility to over-reliance on science, and how this can be detrimental to the legal process. It may also be worthwhile for the continued education of judges and lawyers to include an explanation of the prejudicial impact that over-reliance on science can cause to the adjudicative process.

The Goudge Inquiry report presents a balanced and principled assessment of the science and law interaction, resulting in useful recommendations regarding the court's use of science. If followed, these recommendations can assist in arriving at procedurally sound adjudicative outcomes where scientific evidence is involved, and can therefore be endorsed from the perspective that procedural legitimacy is vital to acceptable legal outcomes.

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[46] *Ibid* at 11.
[47] Official Course Description available online: Schulich School of Law Course List, <http://law.dal.ca/Current_Students/Courses/> .

Part 3. Conclusion

The most appropriate solution to the issues arising out of the science and law interaction will recognize the utility of scientific evidence, as well as its potential to distort the process of legal fact-finding. The Goudge Inquiry Report contains a proper recognition of both. The recommendations account for the potential prejudice of scientific evidence by calling on judges to ensure that admissibility rules are appropriately applied to scientific evidence, so that triers of fact are provided with appropriate evidence. This can be accomplished, the Report suggests, if judges play their gate-keeping role vigilantly, requiring them to scrutinize the qualifications of experts and to determine the threshold reliability of expert evidence at the admissibility stage. Both of these recommendations are grounded in the *Mohan* admissibility analysis for expert evidence. As such, rather than altering the pre-existing admissibility rules, judges are called on to cogently apply the *Mohan* admissibility analysis to scientific evidence, where the potential for prejudicial impact may be amplified. Ensuring that the admissibility rules are applied appropriately to scientific evidence is essential to obtaining procedurally sound, valid adjudicative decisions.

Further, the Report draws an important distinction between threshold and ultimate reliability, which judges must keep in mind in order to appropriately apply procedural admissibility rules. Although admissibility rules can generally be understood as exclusionary rules, they can also be interpreted as rules that ensure that juries *are* permitted to hear evidence that they ought to hear. If evidence is too strenuously screened at the admissibility stage (i.e. a judge seeks ultimate reliability

or scientific reliability of evidence before allowing evidence into the trial process), then the trier of fact will not have the opportunity to consider evidence that ought to be considered, and the adjudicative decision could thereby be invalid. Thus, as Goudge J recommends, scientific models may be useful in the threshold reliability determination, but judges ought to be careful not to over-apply science to determine threshold reliability. An overly strict application of scientific factors at admissibility stage will take the judge into a more strenuous analysis than threshold reliability requires.

Finally, the Report implies that the utility of the adversarial process should be appreciated and enhanced rather than altered with a view to better accommodate science. The enhancement can be facilitated by: providing experts with codes of conduct clarifying that their role is to assist the court, not to advocate for a party;[48] providing juries with charges that assist them to prevent over-deference to distinguished experts[49] and over- reliance on scientific ideas; ensuring that disclosure principles are complied with so that cross-examination occurs as informed as possible;[50]and increasing education for all legal players. These enhancements to the existing adversarial procedure are all likely to improve the legal system's ability to understand and appropriately weigh scientific evidence, rather than just defer to it. The ability to properly evaluate scientific evidence so

[48] Goudge Inquiry, *supra* note 3 at 503.
[49] *Ibid* at 511.
[50] *Ibid* at 507.

that it, along with all the other evidence presented, can be weighed and measured against the standard of proof is critical to procedurally sound legal decision-making.

Acknowledging the legitimacy of the adversarial method of arriving at legal outcomes, the Goudge recommendations contain an appreciation of the legal process, rather than displaying a preference for scientific procedures and conclusions. Designed to enhance the adversarial process by providing the tools to ensure proper application of procedural rules to scientific evidence, the Goudge Report validates the argument that consistency in procedure cannot be compromised in an attempt to better accommodate science. The Report therefore embodies the theme of this thesis: the adjudicative process is legitimate in its own right, even though it cannot be as precise as scientific inquiry, and even though it is not able to guarantee factual/substantive accuracy. Because the overall legitimacy of the legal process is derived from consistent adherence to its procedural rules, scientific evidence must be subject to the same legal processes and procedures as any other type of evidence. Scientific developments and advancements are surely impressive, but when science becomes evidence in the judicial sphere, it must be presented on *law's* terms. If not, law's legitimacy is at stake.

Chapter 5: Conclusion

One would probably be hard-pressed to find a judge, lawyer or even a layperson that would not agree that if a plaintiff is unable to prove his or her case, the claim must be dismissed. Even a plaintiff who was in fact wronged, but could not provide enough evidence to prove the claim, would have to be unsuccessful. In that case, the wrongfully injured plaintiff would have no legal recourse and would be left uncompensated, yet the dismissal of the claim is considered the correct and fair legal outcome. Why? Procedural legitimacy justifies this conclusion. For the adjudicative process to be fair, all litigants must be subjected to uniform rules and procedures, so when these rules and procedures are applied properly to decide a case, the outcome is legitimate. The rules of adjudicative decision-making dictate that plaintiffs have the onus of proving their cases, which requires proving relevant legal facts by satisfying the applicable standard of proof. No matter how sympathetic a plaintiff's case may be, if the standard of proof cannot be met to establish a necessary legal fact, the claim is legitimately dismissed. Procedural legitimacy provides that when legal facts are found properly, and legal principles are then correctly applied to those legal facts, the result is legitimate. The outcome may or may not be factually accurate, but procedural accuracy makes it legitimate and fair, because it ensures that litigants are equally and consistently subjected to legal rules and procedures.

My guess is that many people would have an intuitive appreciation of procedural legitimacy, and its role in keeping the legal system fair. Without resorting to procedural legitimacy, we would have no way to validate a substantively inaccurate result like the situation described above, where a plaintiff is wronged but can not prove the relevant legal facts. The fact that we would readily consider that outcome fair led to my impression that we must have some natural awareness of procedural legitimacy. If that is true, then my work can be described as an attempt to transfer procedural legitimacy from the realm of intuition into the more tangible territory of expressed logic. It is important to explicitly define procedural legitimacy and demonstrate its importance so that its significance does not go understated. I have suggested that such under-statement has occurred in the science and law dialogue.

So far, my attempts to explain, demonstrate and apply procedural legitimacy have strengthened my conviction that it must not be underemphasized. As I presented in Chapters 3 and 4, liability determinations and damages determinations both demand adherence to procedure in order to maintain valid legal outcomes. This conclusion rests on the reality that factual accuracy is impossible to guarantee because the evidence available can never paint a complete picture of what occurred in the past, and what will occur in the future. That is the case even where scientific evidence is relevant to the legal issues being tried.

I have explained throughout my thesis that the process of legal fact-finding balances the conditions of uncertainty with the need to resolve legal disputes efficiently and

fairly. Legitimate fact-finding does not depend on the trier of fact being *absolutely* convinced that the fact occurred or did not occur – certainty is not required to find legitimate legal facts. Consequently, there is a possibility that legal facts are not certainly true. But the law is still applied to legal facts despite their potential inaccuracy, so the legal system accepts the chance of substantively inaccurate outcomes. The possibility of substantive/factual inaccuracy is acceptable because of procedural legitimacy. All litigants are subject to the same process of proving legal facts – admissible evidence is relied on and weighed to the relevant standard of proof. Where these fact-finding procedures are properly applied, the established legal facts are legitimately treated as legal certainties, even though there is the chance that they are not factually true. The substantive law is then applied in order to resolve the dispute. This allows the legal decision to be made in a timely manner, despite the conditions of uncertainty. Although the result may be factually inaccurate, it is fair because it is procedurally sound, and all litigants are equally subjected to these procedures.

The commitment to procedural legitimacy underpinned the reasoning of the Supreme Court of Canada and the House of Lords in the personal injury cases presented in Chapter 3. Implicit in their reasoning is the idea that although adjudicative decisions occur in uncertainty, they are legitimate when legal procedures are properly applied. Thereby, the courts have implied that the adjudicative process has an internal source of legitimacy beyond substantive or factual accuracy. That source of legitimacy is consistent application of its own

procedures. Resorting to an external source, like scientific validation, to enhance the legal system can actually distort the adjudicative process, and compromise its legitimacy. Hence, the courts resisted deferring to scientific conclusions, and firmly maintained that litigants must be subject to consistent legal procedures, even where scientific uncertainty causes proof difficulties for injured plaintiffs.

These cases show that the perspective of procedural legitimacy is a necessary addition to the science and law discussion. Just as all litigants should be subject to the same legal procedures, evidentiary rules must be applied consistently to all types of evidence, including scientific evidence, as noted in Chapter 5. That is, admissibility of expert evidence rules must be properly applied to scientific evidence, avoiding deference, so that the trier of fact is presented with admitted evidence. Once admitted, rather than simply deferring to scientific evidence, the trier of fact should be equipped to appropriately evaluate it and assign its probative value. This way, the trier of fact can legitimately determine whether the standard of proof has been met to establish the relevant legal facts. If the procedural rules are not appropriately applied to scientific evidence, the process of legal fact-finding is compromised, and so is the legitimacy of the outcome.

To determine how to avoid deference to science, and to ensure that the applicable procedural rules are applied properly to scientific evidence, I have drawn heavily from the recommendations of the Goudge Inquiry, as I discussed in Chapter 5. These recommendations provide advice and tools that would enable judges and

juries to properly deal with science as evidence in the adjudicative context. Familiarizing all legal actors with scientific reasoning is key to applying the recommendations, and ensuring the procedural propriety of legal outcomes where scientific evidence is involved.

Finally, I reiterate that my cause has not been to understate the obvious preference for factually accurate legal outcomes, nor to under-value scientific evidence. Rather, my aim has been to demonstrate the gravity of ignoring procedural legitimacy. If consistency in procedure is compromised in an overly-eager attempt to accommodate science, then the legal system and the outcomes it produces risk loss of legitimacy.

BIBLIOGRAPHY

LEGISLATION

Canadian Charter of Human Rights and Freedoms, Part 1 of the Constitution Act, 1982, being Schedule B to the Canada Act 1982 (UK), 1982, c 11.

Nova Scotia Civil Procedure Rules, r 55.07, r 55.12.

Ontario Rules of Civil Procedure, r 48, r52.03.

The Alberta Rules of Court, r 6.40.

The British Columbia Supreme Court Civil Rules, r 11.3, r 11-5.

The Federal Court Rules, r 52.1(2) (Canada).

The Federal Rules of Evidence Fed R Ev702 (1975) (United States).

JURISPRUDENCE - CANADA

Andrews v Grand & Toy [1978] SCR 229, 1978 CanLII 1.

Arnold v Teno (Next friend of) [1978] 2 SCR 28, 1978 CanLII 2.

Athey v Leonati [1996] 3 SCR 458, 3 SCJ no 102 (QL).

C & B Corrugated Containers Inc v Quandrant Marketing Ltd [2005] OJ no 1665 (Ontario Supreme Court of Justice).

Clements v Clements, 2012 SCC 32 *(*unreported).

Conklin v Smith [1978] 2 SCR 1107.

Graham v Rourke (1990) 74 DLR (4th), [1990] OJ no 2314 (QL) (ONCA).

Janiak v Ippolito [1985] 1 SCR 146, SCJ no 5(QL).

Kovats v Ogilvie [1971] 1 WWR 561 [1970] BCJ No 653 (QL) (BCCA).

Lafferiere v Lawson [1991] 1 SCR 541, SCJ no 18 (QL).

Milana v Cartsch (1985), 49 BCLR (2d) 33 at 78.

R v Clarke [1984] 13 CCC (3d), 117 AJ no 19 (QL) (ABQB).

R v Collins [2001] 160 CCC (3d) 85, OJ no 3894 (QL) (Ont C.A.).

R v J.L.J [2000] 2 SCR 600, SCJ No 52 (QL).

R v Lifchus [1997] 3 SCR 320, SCJ no 77 (QL).

R v Mohan [1994] 2 SCR 9, SCJ No 36 (QL).

R v Trochym [2007] 1 SCR 239, SCJ no 6 (QL).

R v Watson [1996] 108 CCC (3d) 310, OJ no 2695 (Ont C.A.).

R v Wood [2007] 11 W.W.R. 330, AJ no 895 (QL).

Resurfice Corp v Hanke [2007] 1 SCR 333, SCJ no 7 (QL).

Schrump v Koot (1978) 18 OR (2d) 337 (QL) (O.C.A.).

Snell v Farrell (1990), 72 DLR (4th) 289, SCJ no 73 (QL).

Thornton (Next Friend of) v Prince George School District No. 57 [1978] 2 SCR 267, 1978 CanLII 12.

Unilever PLC v Procter & Gamble Inc. (1993), 47 CPR (3d) 479.

JURISPRUDENCE – UNITED STATES

Daubert v Merrell Dow Pharmaceuticals, Inc. 509 US 579 (1993).

Frye v United States 293 F 1013 (DC Cir. 1923).

General Electric Co v Joiner 522 US 136 (1999).

Kumho Tire Co v Carmichael 526 US 127 (1999).

United States v Williams 583 F.2d 1194 (2d Cir. 1978).

JURISPRUDENCE – UNITED KINGDOM

Davies v Taylor [1972] 3 All ER 836.

Fairchild v Glenhaven Funeral Services Ltd [2003] 1 AC 32.

Gregg v Scott [2005] 2 AC 176 (House of Lords) [*Gregg v Scott*].

Hotson v East Berkshire Area Health Authority [1987] AC 750.

Livingstone v Rawyards Coal Co. (1880), 5 App. Cas. 25 at 39 (HL).

Mallett v McMonagle [1970] AC 166, [1969] 2 All ER 186.

McGhee v National Coal Board [1972] 3 All ER 1008 (HL).

Wilsher v Essex Area Health Authority [1988] 2 WLR 557.

COMMISSION REPORTS

Ontario, Report of the Inquiry into Pediatric Forensic Pathology in Ontario (Toronto: Queen's Printer, 2008) (Chair: Stephen T Goudge), online: <goudgeinquiry.ca>.

Canada, *Kaufman Commission on Proceedings Involving Guy Paul Morin, Report, Recommendations* (Toronto, Ontario Ministry of the Attorney General,1998) (Chair: Fred Kauffman), Online: <http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/morin/>.

SECONDARY MATERIAL - BOOKS

Glen Anderson, *Expert Evidence*, 2d ed (Markham, Ontario: Lexis Nexis Canada Inc. 2009).

Berryman et al, *Remedies: Cases and Materials* 5th Ed (Toronto: Edmond Montgomery Publications Limited, 2006).

Christopher Bruce, *Assessment of Personal Injury Damages*, 4th ed (Markham, Ontario: LexisNexis Canada Inc, 2004).

Alan Bryant, Sidney Lederman & Michelle Fuerst, Sopinka, *Lederman & Bryant The Law of Evidence in Canada*, 3ed (Markham, Ontario: LexisNexis Canada Inc, 2009).

Peter Cane, *Atiyah's Accidents, Compensation and the Law* 5th ed (Toronto and Vancouver: Butterwoth Canada Ltd., 1993).

Jamie Cassells and Elizabeth Adjin-Tettey, *Remedies: The Law of Damages*, 2d ed (Toronto: Irwin Law Inc, 2008).

David Caudill and Lewis LaRue, *No Magic Wand: The Idealization of Science in the Law* (Lanthan: Rowman & Littlefield, 2006).

Kenneth Cooper-Stephenson and Iwan Saunders, *Personal Injury Damages in Canada*, 2d ed (Scarborough, Ontario: Carswell, 1996).

Paul Fayerabend, *Against Method: An Outline of an Anarchist Theory of Knowledge* (London: NLB, 1978).

Ellen I. Picard & Gerald B. Robertson, *Legal Liability of Doctors and Hospitals in Canada*, 4d ed (Ontario: Thompson Carswell, 2007).

Sheila Jasenoff, *Science at the Bar* (Cambridge, MA: Twentieth Century Fund, 1995).

Andreas Kapardis, *Psychology and Law A Critical Introduction*, 3d ed (Cambridge: Cambridge University Press 2010) at 238.

Karl Popper, *The Logic of Scientific Discovery*, 5th ed (London: Hutchinson & Co Ltd, 1968).

David Kemp, ed, *Damages for Personal Injury and Death*, 5th ed (London: Longman Group Ltd, 1993).

Lara Khoury, *Uncertain Causation in Medical Liability (*Portland: Hart Publishing, 2006)

Lewis Klar, *Tort Law*, 3ed (Toronto: Carswell, 2003) at 389-392.

Thomas Kuhn, *The Structure of Scientific Revolution* (Chicago: University of Chicago Press, 1970).

Larry Laudan, *Truth, Error and Criminal Law: An Essay in Legal Epistemology* (Cambridge, New York: Cambridge University Press, 2006).

Philip Osborne, *The Law of Torts* (Toronto: Irwin Law Inc., 2011).

David Paciocco and Lee Stuesser, *The Law of Evidence,* Revised 5ed, (Toronto: Irwin Law Inc., 2008).

Alex Stein, *Foundations of Evidence Law* (Oxford, New York: Oxford University Press, 2005).

Ernest Weinrib, *Tort Law: Cases and Materials*, 3ed (Toronto: Montgomery Publications Limited, 2009).

John Henry Wigmore, *Evidence in Trials at Common Law*, Vol. 9, revised by James H. Chadbourne (Boston: Little, Brown & Co., 1981).

SECONDARY MATERIALS - ARTICLES

Sarah Barmak, "The fallacy of lying eyes and guileless smiles; A new study shows judges and others form biases based on the faces of people in court", The Toronto Star (August 15, 2010) (QL).

David E. Bernstein, "Junk Science in the United States and the Commonwealth" (1996) 21 Yale J. Int'l L. 123 at 128.

Justice Ian Binnie, "Science in the Courtroom: The Mouse that Roared"(2007) 56 UNB LJ 307.

Russell Brown, "Known Unknowns in Cause-In-Fact" (2011) 39 Advocates' Q 37.

Russell Brown, "Material Contribution's Expanding Hegemony: Factual Causation After Hanke v. Resurfice Corp." (2007) 45 Can Bus LJ 432 at 456.

Russell Brown, "The Possibility of "Inference Causation": Inferring Cause-in-Fact and the Nature of Legal Fact-Finding" (2010) 55 McGill LJ 1.

Jamie Cassels, "Damages for Lost Earning Capacity: Women and Children Last" (1992) 71 Can Bar Rev 445.

Ken Cooper, "Assessing Possibilities in Damages Awards – The Loss of a Chance or the Chance of a Loss" (1972-73) 37 Sask L Rev 193.

Robert Cramer, Stanely Brodsky & Jamie DeCoster, "Expert Witness Confidence and Juror Personality: Their Impact on Credibility and Persuasion in the Courtroom" (2009) 37.1 J Am Acad Psychiatry Law 63.

John E. Coons, "Approaches to Court Imposed Compromise – The Uses of Doubt and Reason" (1963-64) 58 Nw UL Rev 750.

Gary Edmond, "Judicial Representations of Scientific Evidence" (2000) 63 Mod L Rev 216.

Gary Edmond, "Merton and the Hot Tub: Scientific Conventions and Expert Evidence in Australian Civil Procedure" (2009) 72 Law and Contemp Probs 159.

Gary Edmond, "Pathological Science? Demonstrable Reliability and Expert Forensic Pathology Evidence" (Toronto: Government of Ontario, 2007), prepared as a research paper for the Goudge Inquiry.

Gary Edmond and Kent Roach, "A Contextual Approach to the Admissibility of the State's Forensic Science and Medical Evidence" (2011) 61 UTLJ 343.

Steven Friedland "On Common Sense and the Evaluation of Witness Credibility" (1990) 40 Case W Res L Rev 165.

Elaine Gibson, "The Gendered Wage Dilemma In Personal Injury Damages" in Ken Cooper-Stephenson and Elaine Gibson, eds Tort Theory (Ontario: Captus Press Inc., 1993).

Susan Haack, "Trial and Error: The Supreme Court's Philosophy of Science" (2005) 95 AMJ.Pub. Health (Supplement 1) S66.

Susan Haack, "Truth and Justice, Inquiry and Advocacy, Science and Law" in Putting Philosophy to Work - Inquiry and its Place in Culture (Amherst, New York: Prometheus Books, 2009).

Susan Haack, "Irreconcilable Differences? The Troubled Marriage of Science and Law" (2009) 72 Law & Contemp Probs 1.

Susan Haack, "Entangled in the Bramble-Bush, Science in the Law" in Susan Haack, Defending Science Within Reason (Amherst, New York: Prometheus Books 2003).

Learned Hand, "Historical and Practical Considerations Regarding Expert Testimony" (1901) 15 Harv L Rev 40.

Joseph King, "Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences," (1980-81) 90 Yale LJ 1353.

Dennis Klimchuk and Vaughan Black, "A Comment on Athey v. Leonati: Causation, Damages and Thin Skulls" (1997) 31 UBC L Rev 163.

Carol Krafka et al, "Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials" (2002) Psychol, Pub Pol'y & L 309.

Charles T. McCormick, "The Standard of Certainty in the Measurement of Damages" (1933-34) 43 Yale LJ 1109.

Paul Michell and Renu Mandhane, "The Uncertain Duty of the Expert Witness" (2005) 42 Alta L Rev 635.

Elizabeth Reifert, "Getting into the Hot Tub: How the United States Could benefit from Australia's Concept of Hot Tubbing Expert Witnesses" (2011) 89 U Det Mercy L Rev 103.

Judy Van Rhijn, "Hot-Tubbing Experts – Should Lawyers Like it?" (2011) 35.7 Canadian Lawyer 43.

Joseph Sanders, "Science, Law, and the Expert Witness" (2009) 72 Law & Contemp Probs 63

"Damages Contingent Upon Chance" (1963-1964) 18 Rutgers L Rev 875.

LECTURES

Hon J Thomas A. Cromwell, "The Challenges of Scientific Evidence" (McFayden Lecture, Memorial Series, sponsored by the Scottish Council of Law Reporting, delivered at the Royal Society of Edinburgh, March 2, 2011), online: <http://www.scottishlawreports.org.uk/publications/macfadyen-2011.html>.

Hon J Spigelman, "Truth and the Law" 85 ALJ 746, The Sir Maurice Byers Lecture, delivered at the NSW Bar Association on 26 May 2011.

OTHER MATERIALS

Canadian Judicial Council Model Jury Charges Model Jury Instructions – Instruction 7.18, Expert Opinion, online: Canadian Judicial Council <http://www.cjcccm.gc.ca/english/lawyers_en.asp?selMenu=lawyers_pmf_types >

Reference Manual on Scientific Evidence, 3d ed (Washington: National Academic Press, 2011) online: National Judicial Center <http://www.fjc.gov/library/fjc_catalog.nsf>

PAPERS SUBMITTED FOR COURSE CREDIT

Nayha Acharya, "Methodological Prospectus - Science, Law and Legitimacy: Procedural Legitimacy Applied to the Science and Law Interaction," submitted for the Graduate Seminar, 2011-2012.

Nayha Acharya, 'The Arduous Task of Judges when Science Meets Law: Perspectives from Mental Injury Evidence," submitted for Mental Disability Law, Fall Term, 2011-2012.

Nayha Acharya, "Law's Treatment of Science: From Idealization to Understanding", an earlier version of which was submitted for Science and Law, Fall Term 2011-2012.