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WRONGFUL CONVICTIONS: DETERMINING CULPABILITY WHEN THE SAND KEEPS SHIFTING

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I. DEFINING THE ISSUE

The intersection of law with forensic science and medicine is not always an easy one. Evidence-based trial processes seek facts, certainty, and finality. Forensic science and medicine, on the other hand, provide opinion-based conclusions that may change as professional views become more refined or completely overtaken by new technologies.

Flawed scientific evidence has contributed to the conviction of innocent persons who were charged lawfully with crimes. Incredibly, in some instances, no crime had been committed at all.

Indeed, recent studies suggest that flawed forensic science is the second leading cause of wrongful convictions, acting as a contributing

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factor in half of the cases in which inmates have been exonerated through DNA testing.¹

How can this be? After all, these are the men and women in white lab coats who epitomize neutrality and independence. They assist in resolving the facts in issue through the application of truth-seeking scientific and medical processes. What has happened? Has science and medicine failed to live up to the standards of technical accuracy demanded by the courts and expected by the public? Or have we expected too much?

In this essay, I will describe what forensic science is and outline its limitations. I will then examine the experience of several of the forensic sciences, including forensic pathology, in Canada, the United Kingdom, and the United States, including pathways to relief where a miscarriage of justice has occurred. I will conclude with a discussion of whether and to what extent criminal cases that rely heavily on forensic science, particularly pathology, can ever be considered “over” and final.

¹ The Innocence Project, affiliated with the Benjamin N Cardozo School of Law at Yeshiva University, on the basis of the first 232 persons in the United States exonerated through post-conviction DNA testing. At the time of writing (August 2013), there have been 311 post-conviction exonerations in the United States. See Innocence Project, Press Release, “National Academy of Sciences Urges Comprehensive Reform of US Forensic Sciences” (18 February 2009), online: <<http://www.innocenceproject.org>>. While the statistics in Canada and elsewhere tend to be more anecdotal than systematic, it is clear that flawed forensic evidence has played a significant role in other countries. In Canada: Morin (hair and fibre played a major role); Lamer Commission (forensic practices); Driskell (hair microscopy); and Goudge Inquiry (pathology). In Australia: the Royal Commission of Inquiry into Chamberlain Convictions (1987) (blood analysis). In New Zealand: the Royal Commission to Inquire into the Convictions of Arthur Allan Thomas (1980) (bullets and rifling). And in the United Kingdom: a series of tragic wrongful convictions due to faulty pathology. I have described several of these cases, along with equally disconcerting miscarriages of justice involving alleged IRA sympathizers in the United Kingdom. See Bruce A MacFarlane, “Convicting the Innocent: A Triple Failure of the Justice System” (2006) 31:3 Man LJ 403 at 417–21, 454–65 [MacFarlane, “Convicting the Innocent”]. For an excellent international perspective, see Bibi Sangha, Kent Roach & Robert Moles, *Forensic Investigations and Miscarriages of Justice* (Toronto: Irwin Law, 2010).

II. WHAT ARE THE FORENSIC SCIENCES?

The National Institute of Justice describes forensic science as “the application of scientific knowledge to the legal system.”² The American Academy of Forensic Services takes the matter one step further, describing the *role* of the forensic scientist:

The single feature that distinguishes forensic scientists from any other scientist is the certain expectation that they will appear in court and testify to their findings and offer an opinion as to the significance of those findings. The forensic scientist will testify not only to what things are, but to what things mean. Forensic science is science exercised on behalf of the law in the just resolution of conflict.³

The roots of the forensic sciences are found in Europe. In 1898, Hans Gross, an investigating magistrate and professor of criminology at the University of Prague, published a book that described the need for a scientifically trained investigator who could undertake certain technical aspects of an investigation.⁴ “Criminalistics”, as it became known, evolved into the “recognition, collection, identification, individualization, and interpretation of physical evidence, and the application of the natural sciences to law-science matters.”⁵

In practical terms, the forensic sciences now encompass an extraordinarily wide range of scientific activities: “forensic biology (in DNA analysis); forensic chemistry; forensic toxicology; forensic microscopy; analysis of controlled substances, fire debris, explosive residues, hairs, fibers,

² National Law Enforcement and Corrections Technology Center, “The National Institute of Justice and Advances in Forensic Science and Technology” (Washington, DC: National Institute of Justice, 1998) at 1, online: <<https://justnet.org>>, cited in Kelly M Pyrek, *Forensic Science Under Siege* (Burlington, Mass: Elsevier Academic Press, 2007) at 4.

³ John I Thornton, “The General Assumptions and Rationale of Forensic Identification” in David L Faigman et al, eds, *Modern Scientific Evidence: The Law and Science of Expert Testimony* (St Paul, Minn: West Publishing, 1997) vol 2, 1 at 3 [emphasis in original], cited in Pyrek, *supra* note 2 at 4.

⁴ Pyrek, *supra* note 2 at 4.

⁵ *Ibid*, quoting the National Institute of Justice.

glass, soil, [and] paint;”⁶ as well as the examination of impressions such as fingerprints, footwear, tire tracks, and tool marks. In more recent years, it has also encompassed document examination, crime scene reconstruction, as well as forensic pathology and medico-legal death investigation.⁷

Red flags have recently been raised about the accuracy and probative value of the forensic sciences in court. One author has put it this way:

Forensic science is multidisciplinary, encompassing a wide spectrum of subspecialties that are steeped in the traditional sciences, yet it is criticized for being a renegade field that is more fringe than fundamental in terms of practices reflecting validated methods and original research that yields empirical data.⁸

I will next consider whether and to what extent it is accurate or even fair to label the forensic sciences as a “renegade field” that lacks a scientific basis.

III. RELIABILITY OF THE FORENSIC SCIENCES

Historically, forensic science and forensic medicine have developed and evolved in support for the state’s legal and court system. Gary Edmond, a respected legal scholar from Australia who testified at the Gouge Inquiry into Pediatric Forensic Pathology in Ontario (2008),⁹ contended that the expertise that has arisen in this field “ha[s] evolved in a symbiotic relationship with the criminal justice system.”¹⁰ Significantly, he added: “From the judicial perspective that relationship has been characterized by trust rather than scrutiny or accountability.”¹¹ Edmond explains:

⁶ *Ibid* at 4.

⁷ *Ibid* at 4–5.

⁸ *Ibid* at 5.

⁹ Gary Edmond, “Pathological Science? Demonstrable Reliability and Expert Forensic Pathology Evidence”, a paper presented to the Gouge Inquiry into Pediatric Forensic Pathology in Ontario (2008), published online: <<http://www.attorneygeneral.jus.gov.on.ca>>. Dr. Edmond is a professor of law at the University of New South Wales in Sydney, Australia. He is an evidence scholar with a background in science, and a leading commentator on the interaction between science and law.

¹⁰ *Ibid* at 13.

¹¹ *Ibid*.

Common-law judges have often preferred to rely on earlier decisions and legal commentary than undertake a review of the validity or accuracy of widely used and presumptively admissible techniques and theories. With the continuing support of the state and legal institutions, forensic scientific and medical practice have been relatively sheltered from serious scrutiny and the need to test their techniques.¹²

Edmond argued that forensic evidence was often based on intuition, speculation, and anecdotal experiences—a formula that made it very difficult for the defence to challenge the expert’s testimony—and for the judiciary to evaluate it. He made the point in this way:

Historically, forensic science and medicine have relied upon “art” and “experience” in addition to experimental techniques. Where forensic pathologists, or other forensic scientists and technicians, rely upon their experience at trial, they create pronounced difficulties. They produce opinions that may be practically difficult to assess. Unless the expert has been formally censured, is known to have made errors in the past, or his or her opinion is wildly speculative, implausible, or obviously outside their previous experience, it can be incredibly difficult for the defence to meaningfully challenge the expert’s evidence.¹³

One primary goal of our criminal trial process is truth-seeking.¹⁴ If Edmond is correct, do the historical roots of forensic science, coupled with a lack of sufficient judicial control and increased reliance on this type of evidence in high-profile or razor-thin Crown cases, raise the risk of distorted decision making and wrongful convictions? Can the “symbiotic relationship” suggested by Edmond lead to an unacceptable alignment among forensic scientists, the police, and prosecutors? Edmond suggested

¹² *Ibid* at 14.

¹³ *Ibid* at 15. The Supreme Court of the United States made a similar observation, broadening it to expert evidence generally, in stating that “[e]xpert evidence can be both powerful and quite misleading because of the difficulty in evaluating it”: *Daubert v Merrell Dow Pharmaceuticals* (1993), 509 US 579 at 595, 113 S Ct 2786, citing Judge Weinstein, 138 FRD 631 at 632.

¹⁴ See *R v Grant*, 2009 SCC 32, [2009] 2 SCR 353; *R v Last*, 2009 SCC 45, [2009] 3 SCR 146; *R v Harrison*, 2009 SCC 34, [2009] 2 SCR 494; *R v Darrach*, 2000 SCC 46, [2000] 2 SCR 443; *R v F (CC)*, [1997] 3 SCR 1183, 154 DLR (4th) 13; *R v Levogiannis*, [1993] 4 SCR 475, 16 OR (3d) 384.

that the risk of miscarriage was raised, and seemed to agree that this specialty area might indeed be a “renegade” field:

[F]orensic medicine and the forensic sciences seem to have operated outside or at the margins of mainstream biomedical and scientific research. To some extent their operations are a function of the expectations placed upon them by police and investigative agencies, the reluctance of courts to impose more appropriate standards, as well as the types of cases and issues forensic experts are required to investigate. The professional marginalization of forensic science and medicine is also a result of the historical unwillingness of governments to adequately resource and regulate them. The close relations between forensic scientists, investigators, police, and prosecutors seem to have fostered a range of pro-prosecution orientations and sympathies. In conjunction with unexplained judicial confidence, these commitments have contributed to a state of affairs that may be undesirable in a system concerned with truth and justice.¹⁵

In 2009, the National Academy of Sciences in the United States (NAS) delivered a stinging report on that nation’s forensic science system, calling for major reforms and new research. The report cannot be ignored: it was mandated by the US Congress, and prepared by a 17-person, multidisciplinary committee consisting of senior judges, medical examiners, academics from legal and scientific fields, and an independent attorney, as well as forensic, standards, and statistical experts.¹⁶

Its most important message was simple: forensic evidence is regularly offered in criminal prosecutions and civil litigation to support conclusions about “individualization”, in other words, to “match” a piece of evidence to a particular person, weapon, or other source. But, the NAS warned,

¹⁵ Edmond, *supra* note 9 at 14.

¹⁶ The National Academy of Sciences is a society dedicated to advancing the public interest, comprised of distinguished scholars engaged in scientific and engineering work. It was established by an Act of Congress in 1863, and since then, political leaders and policy makers in the United States have turned to it for advice on scientific and technological issues that frequently pervade public policy decisions. The Academy’s membership is presently composed of approximately 2,200 members and 400 foreign associates, of whom nearly 200 have won Nobel Prizes. Members are elected on the basis of their distinguished research; election to the Academy is considered one of the highest honors that can be given to a scientist or engineer. See National Academy of Sciences, *About NAS*, online: <<http://www.nasonline.org>>.

[w]ith the exception of nuclear DNA analysis . . . no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.¹⁷

The NAS noted that non-DNA forensic disciplines have important roles, but many need substantial research to validate basic premises and techniques, assess limitations, and determine the sources and magnitude of error.

Does this, then, explain how forensic science has led the criminal justice system astray in a number of common law jurisdictions over the past few decades? Certainly, that was what the NAS thought. In its report to Congress, the NAS concluded that “in some cases, substantive information and testimony based on faulty forensic science analyses may have contributed to wrongful convictions of innocent people.”¹⁸ Indeed, the NAS was prepared to drill down further and describe areas of risk posed by some of the forensic sciences: specifically, undue weight on evidence and testimony derived from imperfect testing and analysis, and imprecise or exaggerated expert testimony that contributed to the admission of erroneous or misleading evidence.¹⁹

A similar report emerged in Canada four years later, in 2013. The Centre for Forensic Science and Medicine at the University of Toronto coordinated the first multidisciplinary discussion of forensic science in Canada, drawing together key forensic scientists from across the country to discuss, in a collaborative forum, the current state of forensic science in Canada. In the resulting report (“Forensic Science in Canada”), the Director of the Centre, Dr. Michael Pollanen, observed that “[b]oth public and judicial confidence in our practice have been eroded by several

¹⁷ NAS, *Strengthening Forensic Science in the United States: A Path Forward* (Washington, DC: The National Academies Press, 2009) at 7, online: National Criminal Justice Reference System <<https://www.ncjrs.gov>>.

¹⁸ *Ibid.* at 4.

¹⁹ *Ibid.*

high-profile inquiries into damage wrought by faulty forensic evidence, and must be rebuilt.”²⁰

Those attending this consensus-building workshop declined to advocate the path chosen in the United States—in particular, the establishment of new agencies and systemic reforms. Rather, the Report noted that “[f]orensic science in Canada is at a critical juncture”²¹, and called for the development of a national strategic plan for the forensic sciences that recognizes two major trends already driving change in Canada: a shift to an evidence-based paradigm in forensic science inquiry and the need to bridge the gap between expectations and deliverables in expert opinion evidence. Those in attendance sought to encourage dialogue, and were “hopeful that the normal instruments of public policy renewal will be inspired to reflect upon the issues raised [in the Report].”²²

Those participating recognized the critical need to move from an “expert-knows-best paradigm of expert witness testimony” to one where experts are accountable to the public for their conclusions, and are prepared to defend those views with reference to current scientific evidence.²³ This means that views have changed, and will continue to change in the future:

But just as our approach has changed, so does science: new theories, methods and techniques are developed every day, and understanding how these change forensic science presents unique challenges and opportunities. We are mindful that these new developments are as challenging to lawyers and judges as they are to the scientific community.²⁴

As noted earlier, the forensic sciences span a broad range of disciplines. Each carries its own set of technologies and methods, leading to wide variability in terms of techniques, reliability, error rate, underlying research, and published literature.²⁵ In broad terms, however, the forensic sciences

²⁰ Michael S Pollanen et al, eds, *Forensic Science in Canada: A Report of Multidisciplinary Discussion* (Toronto: Centre for Forensic Science at the University of Toronto, 2013) at 3, online: <<http://www.forensics.utoronto.ca>>.

²¹ *Ibid.*

²² *Ibid* at 10.

²³ *Ibid* at 100.

²⁴ *Ibid* at 9.

²⁵ *Ibid* at 6–7.

tend to fall into two basic categories: laboratory-based (e.g., DNA, toxicology, and drug analysis); and those based on interpretation of observed patterns (e.g., fingerprints, handwriting analysis, bite marks, hair microscopy, and, in a different sense, forensic pathology).²⁶ Concerning this state of affairs, the NAS “found substantial evidence indicating that the level of scientific development and evaluation varies substantially among the forensic science disciplines.”²⁷

The reality is that the “interpretative” forensic sciences, those that rely primarily on the judgment of an individual, are not always based on scientific studies that can underpin their validity and reliability.²⁸ As the NAS concluded, “there is a notable dearth of peer-reviewed, published studies establishing the scientific bases and validity of many forensic methods.”²⁹ To complicate matters, some “interpretative” forensic sciences are based on theories that shift from time to time. A foundational theory that may lead to a particular forensic conclusion in one decade may be in doubt during the next decade—or, worse still, may be totally discredited by the very discipline that earlier supported and advanced them for a finding of criminal culpability. In other cases, long-accepted practices and methodologies may simply be overtaken by a more exacting technology, such as DNA.

Several of the interpretative forensic sciences have notoriously contributed to wrongful convictions in a number of Anglo-based criminal justice systems.³⁰ Three, in particular, have come under intense judicial scrutiny: hair microscopy; fingerprint comparisons; and forensic pathology, particularly as it relates to the so-called “Shaken Baby Syndrome”.

A. FORENSIC MICROSCOPY: HAIR COMPARISONS

One of the weakest forms of forensic science traditionally relied upon by police and prosecutors is known as “forensic microscopy”. In its simplest

²⁶ *Ibid.*

²⁷ *Ibid* at 7.

²⁸ *Ibid* at 8.

²⁹ *Ibid.*

³⁰ See the brief survey of this issue at *supra* note 1.

terms, this process involved a side-by-side comparison, under a microscope, of a “known” substance, often strands of hair taken from a suspect, to other strands of hair, the “questioned” evidence, taken from the crime scene. The object was to see if the two come from the same source.³¹ The probative value, it was argued, was simply this: if there is a “match”, the suspect must have been at the crime scene.

Law enforcement agencies throughout North America regularly have used this comparative procedure as an investigative tool. Hairs are routinely shed, thus capable of being transferred from an individual to the crime scene, and from the crime scene to an individual.³² During the 1970s and 1980s, and into the 1990s, the policing community placed considerable emphasis on hair microscopy. The RCMP alone maintained a staff of approximately 35 hair examiners across Canada.³³ But it was just a tool: hair comparisons were simply intended to provide a “class association”; that is, as the NAS put it in 2009:

[A] conclusion of a “match” means only that the hair could have come from any person whose hair exhibited—within some levels of measurement uncertainties—the same microscopic characteristics, but it cannot uniquely identify one person. However, this information might be sufficiently useful to “narrow the pool” by excluding certain persons as sources of the hair.³⁴

So it was fundamentally an investigative tool intended to “narrow the pool” of suspects. Despite this, prosecution services sometimes used the results of the comparison as evidence in criminal prosecutions. Hair microscopy faded from prominence during the mid to late 1990s (at least on the court side) with the advent of DNA technology.³⁵

³¹ NAS, *supra* note 17 at 156; Brandon L Garrett, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong* (Cambridge: Harvard University Press, 2011) at 95.

³² NAS, *supra* note 17 at 155–56.

³³ *Report of the Commission of Inquiry Into Certain Aspects of the Trial and Conviction of James Driskell* (Winnipeg: Government of Manitoba, 2007) at 174, online: <<http://www.driskellinquiry.ca>> [Driskell Report].

³⁴ NAS, *supra* note 17 at 156.

³⁵ Driskell Report, *supra* note 33 at 175.

For reasons I will now develop, hair microscopy probably yielded nothing more than an educated guess.³⁶ Its probative value was slight, the prejudicial effect on the conduct of the trial was significant, and its use ought to have been confined to investigations and not extended into the courtroom.³⁷

The modern critique of hair microscopy evidence, at least in Canada, started with the Commission on Proceedings Involving Guy Paul Morin.³⁸

On 3 October 1984, Christine Jessop, a 9-year-old girl, was murdered. Suspicion immediately fell on her next-door neighbor, Guy Paul Morin. In short order, he was charged with her murder.

The case was entirely circumstantial. Among other things, the Crown relied on hair comparisons to demonstrate that there had been physical contact between Christine Jessop and the accused, and that Christine had been transported in Morin's car to her death. This evidence was said to refute the accused's denial that he had not had any contact with Christine, and that she had never been in his car.

More specifically, when Christine's body was discovered, a single dark hair was found embedded in skin tissue adhering to her necklace. This hair was not Christine's, and was presumed to have come from her killer. On microscopic analysis, experts concluded that the hair "could have originated" from Morin. Three hairs found in Morin's car were likewise said

³⁶ To adopt the phrase used consistently (albeit in a different context) in the following appellate decisions: *R v Ranger* (2003), 67 OR (3d) 1 at para 82, 178 CCC (3d) 375 (CA); *R v Clark* (2004), 69 OR (3d) 321 at para 79, 182 CCC (3d) 1 (CA); *R v Klymchuk* (2005), 203 CCC (3d) 341 at para 37, 205 OAC 57 (CA) [*Klymchuk*].

³⁷ Even if the test for admissibility of expert evidence is met, a trial judge may reject the proffered evidence if its prejudicial effect on the conduct of the trial outweighs its probative value. See *R v Bennett* (2003), 67 OR (3d) 257, 179 CCC (3d) 244 (CA); *R v DD*, 2000 SCC 43 at para 11, [2000] 2 SCR 275. I will turn to this later on in this section, but the Ontario Court of Appeal has powerfully observed that items of evidence amounting to nothing more than "educated guesses" can play a valuable role in the investigation of crime by directing the police to fruitful areas of investigation. They cannot, however, be admitted as evidence under the guise of expert opinion": *Klymchuk*, *supra* note 36 at para 37.

³⁸ *Report of the Kaufman Commission on Proceedings Involving Guy Paul Morin*, vol 1 (Toronto: Ontario Ministry of the Attorney General, 1998), online: <<http://www.attorneygeneral.jus.gov.on.ca>> [Morin Report].

to be dissimilar to the accused's hairs; experts contended that they were similar to Christine's hairs and "could have" come from her.

After multiple trials and appeals, Morin was acquitted in 1995 on the basis of fresh DNA evidence tendered jointly by the Crown and the defence. Ontario called a public inquiry to find out what had happened, and appointed The Honourable Fred Kaufman, a former judge of the Quebec Court of Appeal, to preside over the Inquiry. The hair comparison evidence played a significant role in Commissioner Kaufman's conclusion that Morin had been wrongly convicted. He cited three central concerns:

- a) Hairs are not unique, and the assessment of the similarities, differences, and importance of hair characteristics is highly subjective. The comparison of hairs cannot yield a conclusion that a particular person was the donor of an "unknown" hair.³⁹
- b) The strongest conclusion that can be drawn is that a hair is "consistent with" having come from a particular source. The second strongest conclusion is that a hair "could have" come from a particular source, and an even weaker conclusion is that a particular hair "cannot be excluded" as having come from the same source. None of these conclusions identifies the source of the unknown hair. The nuances developed by scientists in this area are easily miscommunicated and misapprehended by lay triers of fact; and, in this case, the language used contributed to Morin's wrongful conviction.⁴⁰
- c) The experts failed to adequately communicate the limitations upon their findings to both the prosecutors and the court.⁴¹

In this circumstance, Commissioner Kaufman noted cautionary words from the Supreme Court of Canada to the effect that expert evidence can easily be misused and can distort the fact-finding process. Famously, that Court said: "Dressed up in scientific language which the jury does not easily understand and submitted through a witness of impressive

³⁹ *Ibid* at 88.

⁴⁰ *Ibid* at 88–89, 101–10.

⁴¹ *Ibid* at 103.

antecedents, this evidence is apt to be accepted by the jury as being virtually infallible and as having more weight than it deserves.⁴²

In the result, Commissioner Kaufman recommended that trial judges should: a) undertake a more critical analysis of hair comparison evidence, and where it only shows that an accused cannot be eliminated, exclude the evidence;⁴³ b) if admitted, charge the jury that it should not be overwhelmed by any aura of scientific authority or infallibility of the evidence, and explain the limitations that should be applied to the expert's findings;⁴⁴ and c) not permit experts to use demonstrably misleading language such as "consistent with" and "match" in the context of forensic hair comparisons.⁴⁵

The Ontario Court of Appeal accepted the cautions and reasoning of Commissioner Kaufman in *R v Bennett*,⁴⁶ an appeal decided in 2003, although the case had its roots in a murder that took place in 1992, an investigation that lasted several years, and a charge of first degree murder laid in 1997.⁴⁷ The case provides a good example of how forensic evidence with very limited probative value can be misused, potentially distorting normal decision making.

At trial, an experienced examiner employed by the Centre of Forensic Sciences in Ontario undertook a microscopic examination of 292 human hairs found at the murder crime scene. He concluded that 13 hairs "showed different levels of microscopic similarity to the appellant's known hair sample."⁴⁸ The case for the Crown was entirely circumstantial

⁴² *R v Mohan*, [1994] 2 SCR 9 at 21, 114 DLR (4th) 419 [*Mohan*]. In an earlier case, the Court had commented on the difficulty in assessing the proper weight to be given to evidence cloaked under the "mystique of science": *R v Beland*, [1987] 2 SCR 398 at paras 20, 27, 64, 43 DLR (4th) 641.

⁴³ See Recommendation 2, Morin Report, *supra* note 38 at 45 of the Executive Summary and at 312 of the Report.

⁴⁴ See Recommendation 5, *ibid* at 46 of the Executive Summary and at 329 of the Report.

⁴⁵ See Recommendation 9, *ibid* at 47 of the Executive Summary and at 339–44 of the Report. As to the probable origins of these terms, see Garrett, *supra* note 31.

⁴⁶ (2003), 67 OR (3d) 257, 179 CCC (3d) 244 (CA).

⁴⁷ *Ibid*.

⁴⁸ *Ibid* at para 29.

and the hair evidence played a significant role in the overall factual matrix. The accused was a black man; several of the hairs were said to exhibit “negroid characteristics”.

On behalf of the Court, Chief Justice McMurtry noted that an expert opinion that said nothing more than that the accused “cannot be excluded” as the donor had extremely limited probative value; it merely permitted the trier of fact to infer that the accused was one of a “limitless class of persons” who cannot be excluded as perpetrators.⁴⁹ After a detailed review of the evidence, the Court held that the evidence ought not to have been admitted on the basis that its prejudicial effect outweighed its probative value. Three key points led to that conclusion: the hair comparisons had “extremely low probative value”; the potential for prejudice was significant because of the testimony regarding racial characteristics of the hair; and the potential for prejudice was magnified because Crown counsel in his final address had asked the jury to draw inferences unsupported by the testimony of the expert.⁵⁰ The conviction was quashed and a new trial was ordered.

The indictment of forensic microscopy did not stop there. This time it occurred in Manitoba. James Driskell was charged, convicted, and imprisoned for 13 years for first degree murder—a crime for which a retired Chief Justice from Ontario ultimately concluded he had been wrongfully convicted.⁵¹

The story began in 1990, when Driskell was charged with the murder of Perry Dean Harder. The case for the Crown was largely circumstantial and contaminated with unsavoury witnesses, unexplained non-disclosure of critical evidence by the prosecutors and police, and an out-of-court physical confrontation between the lead prosecutor and counsel for one of the Crown witnesses. To make matters worse, the prosecution had tendered and relied upon hair comparison evidence that was said to implicate the accused in the offence.⁵²

At trial, the Crown called an RCMP expert, Tod Christianson, to testify with respect to the hair comparison evidence. In 1990–91, Mr.

⁴⁹ *Ibid* at para 51.

⁵⁰ *Ibid* at paras 67–71, 79–81.

⁵¹ Driskell Report, *supra* note 33 at 1.

⁵² *Ibid* at 146–49.

Christianson was one of about five hair and fibre examiners in the Winnipeg Laboratory of the RCMP Forensic Laboratory Services (RCMP FLS). He had been a hair and fibre examiner for about seven years (including one year as a trainee), and had worked on almost 470 prior hair and fibre cases. He had presented microscopic hair comparison evidence in 26 previous cases. Seemingly, he had all the qualifications and experience that a prosecutor would want.

Mr. Christianson testified that three of the hairs in question from the accused's van (said to have been used in the murder) were microscopically "consistent" with the known hairs attributed to the deceased "within normal range of variation".⁵³ When asked what he meant by "consistent" with, he provided this explanation:

[W]hen I say that a hair is consistent, as I have in this case, that means that the hairs have *all of the features* that the known samples have, within normal biological variation, and there's nothing, nothing you would—that you can't account for. So that if there was some feature, for example abnormal colour or something like that, that would cause that hair to be eliminated. So, it falls exactly within the range of the variation of the known sample with no unaccounted for differences whatsoever.

And the point about this type of analysis is that it's not a positive identification, all right, because the only way you could do that is to look at all the hairs from all the person's head that exist, and that's an impossibility. *But I can tell you, based on my experience, that the chances of just accidentally picking up a hair and having it match to a known sample are very small. So if the hair is consistent, that means it either came from the same person as that known sample or from somebody else who has hair exactly like that.*⁵⁴

Mr. Christianson's evidence at the Driskell trial was in most respects typical of how hair microscopy evidence was presented in Canadian courts during the early 1990s.⁵⁵ There were, however, several problems with it.

⁵³ *Ibid* at 147–48.

⁵⁴ *Ibid* at 150 [emphasis added].

⁵⁵ This was the conclusion reached by Douglas M Lucas MSc, DSc, the former head of the Centre of Forensic Sciences of Ontario, who had been retained by the resulting Commission of Inquiry into the Driskell case to provide advice on Christianson's lab work and trial testimony. See *ibid* at 157, 165. The Lucas report is attached to the

First, his conclusions had not been “peer reviewed” by a second hair examiner, despite the fact that several examiners were available in the same office.⁵⁶ Second, like most other forensic labs at the time, the RCMP FLS did not conduct microscopic hair comparisons “blind”, i.e., the examiner knew something about the police theory of the case and therefore knew if the police were expecting to find a hair “match”.⁵⁷ Third, Mr. Christianson’s testimony was carefully nuanced, but it was doubtful that the jury properly understood the limited probative value of the microscopic observations he made.⁵⁸

During his testimony, Mr. Christianson had fairly pointed out that the examination did not lead to a positive identification. However, he nuanced that observation by saying that the chance of a coincidental match was very small. Indeed, “he [had] presented his results as highly probative on the issue of identity.”⁵⁹

On 15 December 2005, the Province of Manitoba announced that The Honourable Patrick LeSage, QC, former Chief Justice of the Ontario Superior Court of Justice, would conduct an inquiry into certain aspects of the trial and conviction of James Driskell for the murder of Mr. Harder.

Hearings were conducted during 2006, and findings and recommendations of the Inquiry were provided to the Attorney General of Manitoba on 30 January 2007. The Inquiry report was released to the public on 15 February 2007. The hair microscopy evidence and the testimony of Tod Christianson had become central features at the Inquiry.

Mr. Christianson had been wrong in his evidence. Very wrong. DNA examination established that there was “extremely strong support for the proposition” that the hairs in question did not come from the

Driskell Report. See *ibid* at 19 on this point. And it may well be that Mr. Christianson’s manner of testifying reflected practice in the United States as well. In 1985, the FBI convened a symposium bringing the community of hair comparison analysts together. The purpose of the symposium was to develop and agree upon standards. They agreed to avoid use of the term “match”, use “consistent with” or “could have” come from the accused, and not give evidence about probabilities: Garrett, *supra* note 31 at 99.

⁵⁶ Driskell Report, *supra* note 33 at 148.

⁵⁷ *Ibid* at 162–63.

⁵⁸ *Ibid* at 166.

⁵⁹ *Ibid* at 161. See also *ibid* at 163.

deceased; more seriously, the hairs were shown to have originated from *three different persons*.⁶⁰

Like Commissioner Kaufman in the Morin Inquiry, Commissioner LeSage emphasized that, even at the time of the Driskell prosecution, the forensic community widely recognized that microscopic hair comparisons were (and are) highly subjective, and that different examiners sometimes disagree.⁶¹ Most seriously, the debate as to the role and usefulness of hair microscopy was raging at the very time that it was being used in investigations and court proceedings, and the reality was that the “science” itself had never and still has not been properly validated. Dr. Joel Mayer, an expert called at the Driskell inquiry, pointed out that the forensic community itself had contributed to the problem by putting the cart before the horse:

In fact, when hair microscopy and hair examination was being used by many forensic science laboratories, the debate as to the usefulness and the significance of the findings was still raging on. And that’s the wrong way to go about it. That debate should have taken place first, and once there was consensus and agreement, then turn around and employ this technique. So it should have been validated first. Unfortunately, as I look at it, the validation was ongoing while the information was being produced and evidence was given. At the end of the day, is this science?⁶²

Commissioner LeSage thought not. He concluded that supposed scientific evidence should not be presented in criminal trials as probative on the issue of identity unless the process itself, and the conclusions reached, had “a strong empirical and/or theoretical foundation.”⁶³ Hair microscopy failed that test, because it was fundamentally experience-based, not scientifically anchored.⁶⁴

⁶⁰ *Ibid* at 155

⁶¹ *Ibid* at 161.

⁶² *Ibid* at 173.

⁶³ *Ibid* at 172. See also *Klymchuk*, *supra* note 36.

⁶⁴ The RCMP examiners handbook suggested that if examiners were asked to explain the basis for their opinion, they should refer to “‘publications’, ‘attendance at workshops and seminars’, ‘discussions with others in the field’, ‘understudy training’, the ‘100 hair

Indeed, in 2009, the NAS reported that “[n]o scientifically accepted statistics exist about the frequency with which particular characteristics of hair are distributed in the population” and that any effort to link a defendant to hair evidence has “no scientific support”.⁶⁵ A study that double-checked FBI laboratory hair microscopy work through mitochondrial DNA analysis showed it to have an 11% error rate.⁶⁶ Other studies and proficiency tests of hair examiners dating back to the 1970s found error rates ranging from 28% to as high as 68%.⁶⁷ In the end, DNA testing would reveal that in each of four separate Manitoba murder cases, the hair microscopy examination had been incorrect.⁶⁸

That being the case, should hair microscopy evidence have any further role in criminal trials, or have the shifting sands in favour of DNA consigned it to the forensic scrap heap? Commissioner LeSage still saw one last legitimate, albeit narrow, post-investigative role:

I agree with the views expressed by the panelists and in the *Morin Inquiry Report* that if hair microscopy evidence remains admissible, any conclusions should be expressed in “exclusionary” rather than “inclusionary” terms (*i.e.*, framed as a statement that the source of the known hairs cannot be excluded as the source of the questioned hairs).⁶⁹

To sum up: from the 1970s into the 1990s, the policing community placed considerable emphasis on hair microscopy. The RCMP alone maintained a staff of approximately 35 hair examiners across Canada.⁷⁰ Prosecution services likewise relied upon it in court, primarily to assist in establishing the identity of the suspect in murder cases. Testimony in

exercise’ and other ‘proficiency tests’, and their years of casework experience”: Driskell Report, *supra* note 33 at 168–69.

⁶⁵ NAS, *supra* note 17 and accompanying text at 160–61.

⁶⁶ Driskell Report, *supra* note 33 at 172.

⁶⁷ Barry Scheck, Peter Neufeld & Jim Dwyer, *Actual Innocence: When Justice Goes Wrong and How to Make it Right* (New York: New American Library, 2003) at 210.

⁶⁸ Driskell Report, *supra* note 33 at 172. The cases were those of Driskell, Unger, Sanderson, and Robert Starr. On the last named, see *R v Starr*, 2000 SCC 40 at para 200, [2000] 2 SCR 144 [*Starr*].

⁶⁹ Driskell Report, *supra* note 33 at 172.

⁷⁰ *Ibid* at 174.

court was often nuanced but “dressed up in scientific language which the jury does not easily understand, and submitted through a witness of impressive antecedents”;⁷¹ triers of fact inevitably gave the evidence considerable weight. What was not well understood was that, at the time the evidence was being tendered in court, there was considerable dispute within the forensic community itself on whether the evidence was reliable, and how far a witness could go in suggesting that it was probative of critical facts in issue.

The landscape shifted markedly in the 1990s with the advent of, and increasing reliance on, DNA testing, and a trend in the United States to exclude admission of hair microscopy evidence on the basis that it was simply unreliable.⁷² In 1998 and 2007, two commissions of inquiry in Canada demonstrated that hair microscopy evidence involved little more than an educated guess.

Today, hair microscopy is occasionally used in criminal investigations but is rarely if ever tendered as evidence in court. Its probative life has effectively been spent. But what of those persons who were charged and convicted on the basis of this type of evidence during the 1980s and 1990s?

Starting in 2003, Manitoba conducted an independent “sweep” of previous homicide, sexual assault, and robbery cases to see if there were any inmates still behind bars who had been convicted, in part or largely on the basis of hair microscopy evidence. In 2004, the Province announced that two troublesome convictions had emerged from this review. In one case, the trial record apart from the hair microscopy evidence supported conviction. But the second, that of Kyle Unger, led to an application to the Minister of Justice for a review of his conviction pursuant to sections 696.1–696.6 of the *Criminal Code*.⁷³

⁷¹ *Mohan*, *supra* note 42 at 21 and accompanying text.

⁷² *Williamson v Reynolds*, 904 F Supp 1529, 1995 US Dist LEXIS 14144 (ED Okla 1995); Clive A Stafford Smith & Patrick D Goodman, “Forensic Hair Comparison Analysis: Nineteenth Century Science or Twentieth Century Snake Oil?” (1996) 27 *Colum HRL Rev* 227. Proficiency tests of hair examiners dating back to the 1970s have found very high error rates ranging from 28% to 68%. See Barry Scheck, Neufeld & Dwyer, *supra* note 67.

⁷³ RSC 1985, c C-46. For a detailed discussion of the Unger case, and the unprecedented sweep of cases conducted by Manitoba, see my article entitled “Wrongful Convictions:

In November 2005, Mr. Unger was granted bail pending the Minister's decision.⁷⁴ On 11 March 2009, the Minister of Justice ordered a new trial because "there [was] a reasonable basis to conclude that a miscarriage of justice likely occurred in [his] 1992 conviction."⁷⁵ On 23 October 2009, four important announcements were made: Manitoba's senior Crown attorney advised the Court that after a full review of the evidence it had been concluded that "it would be unsafe to retry Unger on the available evidence."⁷⁶ He advised that the Crown would not be calling any evidence, and the Court entered an acquittal as a result. A few hours later, the Minister of Justice for Manitoba announced that no public inquiry would be called. Concurrently, the RCMP announced that it did not intend to reopen the investigation into the murder. Criminal proceedings were over and Mr. Unger was freed. However, the case was not yet over. It was about to move into civil court.

On 21 September 2011, Unger filed a \$14.5 million wrongful conviction lawsuit. In the statement of claim filed in the Manitoba Court of Queen's Bench, he named as defendants the RCMP, individual RCMP members, specific Crown attorneys, as well as both the federal and provincial Attorneys General. The action remains pending.⁷⁷

Is It Proper For the Crown to Root Around, Looking for Miscarriages of Justice?" (2012) 36:1 Man LJ 1. Since then, the United States has followed Manitoba's lead. For a discussion of this, see *infra* notes 287–90 and accompanying text.

⁷⁴ While not authorized under the *Criminal Code*, *supra* note 73, the law is now clear that an inmate under sentence has a constitutional right to apply for and be granted bail where a s 696.1 application has been made and a defined evidentiary threshold has been met. See *R v Phillion*, [2003] OJ no 3422 (QL) (Sup Ct J) at paras 104–05; *Driskell v Canada*, 2004 MBQB 3 at para 48, [2004] 4 WWR 182; *Unger v Canada*, 2005 MBQB 238 at paras 49–51, 196 Man R (2d) 280; *Ostrowski v The Queen*, 2009 MBQB 327 at paras 57–59, 250 CCC (3d) 123.

⁷⁵ "Police made evidence fit the crime in convicting Kyle Unger: lawyer", *CBC News* (11 March 2009), online: <<http://www.cbc.ca/news>>.

⁷⁶ Submission of Don Slough, Assistant Deputy Attorney General for Manitoba: *R v Unger* (23 October 2009), Winnipeg CR 91-01-11124 (Man QB) (Crown submission), online: <<http://www.cbc.ca>>.

⁷⁷ Steve Lambert, "Kyle Unger sues for wrongful conviction in murder of Manitoba teen", *Globe and Mail* (21 September 2011), online: <<http://www.theglobeandmail.com>>. The case is entitled *Kyle Unger v George Dangerfield et al* (court registry

Other provinces have followed suit. In his 2007 report, Commissioner LeSage recommended a national forensic review similar to that conducted in Manitoba.⁷⁸ Subsequently, the heads of all federal and provincial prosecution services reported that by 2011 “all Canadian jurisdictions have conducted reviews in different forms. The most formal were in Ontario and British Columbia.”⁷⁹ The Ontario review was overseen by The Honourable Patrick LeSage. The BC review committee ultimately reviewed two homicide and two sexual assault cases, and “unanimously concluded that there was no reasonable basis to believe that, by virtue of the hair microscopy evidence, a miscarriage of justice ha[d] taken place in the convictions against the four individual accused persons.”⁸⁰

Hair microscopy provides us with an example of a forensic science that was simply overtaken by a highly discriminating identifier: nuclear and mitochondrial DNA analysis. Powerful technology has taken us away from experience-based human interpretations, and provided us with scientifically based laboratory conclusions. Regrettably, this means that fact finding 15 or 20 years ago may have been distorted by faulty forensic science. Fortunately, law enforcement and prosecution services have abandoned this tool in court, and benevolent prosecution services in Canada have conducted a voluntary sweep of cases to see if wrongful convictions may have occurred as a result of Crown reliance on this type of evidence.

The next two types of forensic science have generated considerable controversy in the past decade; they continue, however, to remain very much in play in the criminal justice system, attracting controversy in Canada and abroad.

CI11-01-74071). At the time of writing (August 2013), a statement of defence has just been filed. Progress of the case can be tracked online at <<http://www.jus.gov.mb.ca>>.

⁷⁸ Driskell Report, *supra* note 33 at 182.

⁷⁹ Federal/Provincial/Territorial Heads of Prosecutions Subcommittee on the Prevention of Wrongful Convictions, *The Path to Justice: Preventing Wrongful Convictions* (Ottawa: Public Prosecution Service of Canada, 2011) at 153, online: <<http://www.ppsc-sppc.gc.ca>>.

⁸⁰ *Ibid* at 154.

B. FINGERPRINT COMPARISONS

1. THE “GOLD STANDARD”

The interpretation of forensic fingerprint evidence relies on the experience and expertise of latent print examiners.⁸¹ For 100 years, this evidence has been the “gold standard” of human identification.⁸² Its long-standing track record has continually been respected by the judicial and law enforcement communities, and, most importantly, by the public.⁸³

Developed independently by European and British scientists during the latter part of the 19th century, personal fingerprint identification gained widespread acceptance in North America and Europe during the 20th century.⁸⁴ Accepted as the primary method of identification for law enforcement purposes in Canada in 1908,⁸⁵ and judicially in the United States as early as 1911,⁸⁶ courts simply cited treatises on criminal investigation or general approval of science, and eventually other court decisions, for the proposition that the results of a fingerprint examination were admissible and reliable. The Supreme Court of Canada first cited

⁸¹ Bradford T Ulery et al, “Accuracy and Reliability of Forensic Latent Fingerprint Decisions” (2011) 108:19 Proceedings of the National Academy of Sciences of the United States of America 7733.

⁸² Sandy L Zabell, “Fingerprint Evidence” (2005) 13 JL & Pol’y 143 at 143.

⁸³ The public was first introduced to the power of fingerprint comparisons in a novel by Mark Twain entitled *Pudd’nhead Wilson and Those Extraordinary Twins* (Hartford, Conn: American Publishing, 1894), the story of two babies switched after birth, and the uncovering of the illegal act through fingerprinting. See also Simon A Cole, “Twins, Twain, Galton, and Gilman: Fingerprinting, Individualization, Brotherhood, and Race in Pudd’nhead Wilson” (2007) 15:3 Configurations 227.

⁸⁴ GM Chayko & ED Gulliver, eds, *Forensic Evidence in Canada* (Aurora, Ont: Canada Law Book, 1999) at 456–57.

⁸⁵ PC 1908-1614, (1917) C. Gaz I, 3484.

⁸⁶ *People v Jennings*, 252 Ill 534, 96 NE 1077 (Sup Ct 1911).

fingerprint evidence in 1957 (without discussion),⁸⁷ and as recently as 1988 underscored its probative value in *R v Beare*; *R v Higgins*.⁸⁸

Based on the court record and the state of knowledge in 1988, that Court made a number of assumptions about fingerprint evidence that now are the subject of controversy, namely: no two fingerprints are identical; the process is virtually infallible; and, perhaps more implicitly in its comments, fingerprint identification is a “science” that is reliable and useful, with a corresponding methodology in support.

In fairness, the Court could not have anticipated two major developments in the first decade of the 21st century: first, well-established national forensic services have recently admitted that they made serious errors in fingerprint identification that have attracted worldwide attention and shaken the forensic community; second, with the advent of DNA testing as the “new” gold standard, the public and judiciary largely believe that fingerprint examination can demonstrate a similar scientific validation. The problem is that, so far, it cannot.⁸⁹

⁸⁷ *The Queen v Carey*, [1957] SCR 266 at 271, 23 CR 177, although fingerprints were referred to ten years earlier by the Ontario Court of Appeal. See *R v Dick*, [1947] OR 105, 1947 CanLII 12 (CA).

⁸⁸ [1988] 2 SCR 387 at paras 21–24, 55 DLR (4th) 481, subsequently quoted by the Ontario Court of Appeal when considering the constitutional validity of legislation providing for the taking and continued retention of fingerprints. See *R v Dore* (2002), 166 CCC (3d) 225, 4 CR (6th) 81 (Ont CA).

⁸⁹ Simon A Cole, Associate Professor of Criminology, Law and Society at the University of California, who received a PhD in Science and Technology Studies from Cornell University, and is the author of a leading textbook on suspect identification and fingerprinting, says quite boldly that “[f]ingerprint validation studies still do not exist”: Simon A Cole, “Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents’ Discourse” (2006) 28:1 Law & Pol’y 109 at 129. He contends that this is because, at present, fingerprint examiners are considered experts, and therefore they “have nothing to gain and everything to lose from validation studies” (*ibid* at 129). See also Pyrek, *supra* note 2 at 275–78 (“[f]ingerprinting’s claims and assumptions are clearly surprisingly unproven” at 277); Zabell, *supra* note 82 at 143–44. However, for recent developments in this respect see *supra* note 79 and the accompanying text.

2. INITIAL SIGNALS OF CONCERN

The first warning signal came from the United States in 1999. In a landmark 5-day admissibility hearing, a debate emerged on whether forensic fingerprint identification was admissible and, if it was, what role it should play in the case. Fundamental issues were debated: Is forensic fingerprint identification a science? Is it truly infallible? Is this type of analysis better or worse than a forensic DNA analysis? Is it true that no two fingerprints are alike? How does one determine that? One question that underlay all of the issues was this: is latent print identification “valid”?

In an oral decision, the defence motion to exclude fingerprint evidence and testimony was denied.⁹⁰ On appeal, that ruling was upheld.⁹¹ But the debate was only starting, and, as Neufeld and Scheck wrote in 2002, “the bedrock forensic identifier of the 20th century, fingerprinting, had started to wobble.”⁹²

In 2002, a US federal judge sharply limited the use of fingerprint evidence in a drug-related murder case, on the basis that there was insufficient proof that the methods used by fingerprint analysts had been adequately tested in objective, controlled experiments. Judge Louis H. Pollak, a former Dean of Yale Law School, noted what he called “alarmingly high” error rates in proficiency tests taken by fingerprint examiners. He ruled that fingerprint examination was not a science, and consequently examiners would be permitted to testify only to the points of similarity that they observed, not about whether the prints matched. In a motion for reconsideration, the US Attorney filed the results of proficiency tests and argued that the Court’s ruling could “undermine not only the admission of fingerprint evidence. . . but all manner of forensic testimony”. Judge Pollak reversed himself, but as one commentator noted, “the initial decision sent shock waves through the expert community.”⁹³

⁹⁰ *United States v Mitchell*, No 96-407 (ED Pa 1999).

⁹¹ *United States v Byron Mitchell*, 365 F (3d) 215, 2004 US App LEXIS 8474 (3d Cir Pa 2004).

⁹² Peter Neufeld & Barry Scheck, “Will Fingerprinting Stand Up in Court?”, *The New York Times* (9 March 2002), online: <<http://www.nytimes.com>>.

⁹³ EJ Imwinkelried, “Forensic Science” (2002) 26 Nat’l LJ 18–19.

The challenge to the reliability of fingerprint evidence continues in the United States, led largely by the writings, lectures, and testimony of Dr. Simon A. Cole, Associate Professor of Criminology, Law and Society at the University of California, Irvine. Dr. Cole argues that the controversy concerning fingerprint evidence has tended to focus on whether fingerprint comparison is “science”, and whether fingerprints are truly unique, effectively masking the true issue: what empirical support exists for the claims advanced by the fingerprint examiner community?⁹⁴ He says, amongst other things, that the process of “individualization” (the matching of a print to a single person to the exclusion of all others in the world) has not been scientifically validated and is not possible; traditional examiner assertions of a zero error rate are not supported by research; and while accuracy studies are only now starting to emerge, they have significant limitations that significantly reduce their persuasive value.⁹⁵

3. THE MADRID MISIDENTIFICATION BY THE FBI (2004–2006)

The next event was truly a forensic bombshell. On 11 March 2004, terrorists bombed a train station in Madrid, leaving approximately 200 people dead and another 1,400 injured. Seven weeks later, the FBI arrested an Oregon lawyer named Brandon Mayfield for his seeming involvement in the bombing. His connection to the event was anchored entirely on a fingerprint found by Spanish authorities on a bag of detonating devices used in the bombing. The FBI was “absolutely confident” of the match;⁹⁶

⁹⁴ Simon A Cole & Andrew Roberts, “Certainty, Individualisation and the Subjective Nature of Expert Fingerprint Evidence” (2012) 11 Crim L Rev 824 at 832.

⁹⁵ Simon A Cole, “Fingerprint Evidence in Transition” (Presentation delivered at the Developments in Forensics and Eyewitness ID seminar organized by the Trial Lawyers Association of BC, Vancouver, 11 May 2013) [unpublished]. Note that the Utah Court of Appeals held that it was a reversible error to exclude Dr. Cole’s testimony. See *Utah v Sheehan*, 273 P (3d) 417, 2012 UT App 62 (2012). In this case, his testimony had been tendered to challenge the underlying basis for the opinion of the prosecution’s fingerprint examiner, on the basis that if the prosecution’s expert evidence was reliable and admissible, any testimony challenging that evidence was necessarily unreliable.

⁹⁶ The testing had been performed by three FBI fingerprint examiners, and was further confirmed by a court-appointed independent expert. See “FBI apologizes to lawyer held in Madrid Bombings”, *NBC News* (25 May 2004), online: <<http://www.nbcnews.com>>.

subsequently, however, Spanish authorities announced that the fingerprint actually belonged to an Algerian national. Seventeen days after Mayfield's arrest, the FBI announced that they had made a serious mistake, and apologized to Mayfield.⁹⁷ He was released immediately. It was clear, however, that Mayfield had been wrongfully imprisoned solely on the basis of a faulty fingerprint examination. The Bureau immediately and probably prematurely attempted to explain what had happened:

Upon review it was determined that the FBI identification was based on an image of substandard quality, which was particularly problematic because of the remarkable number of points of similarity between Mr. Mayfield's prints and the print details in the images submitted to the FBI.⁹⁸

Once again, the shock to the forensic community was significant, this time registering at the upper end of its Richter scale. A serious error had been made by the leading forensic investigative agency in the world. They had used their established protocols and methodologies, and had confirmed their findings with an independent expert. The conclusions were reached with absolute certainty. The incident spawned several inquiries, including two by the Justice Department (focusing on the conduct of the prosecutors and the handling of the fingerprint examination by the FBI) as well as a separate one by the Bureau, which focused on the handling of the fingerprint evidence. Mayfield sued and in 2006 the government settled the action for \$2 million.⁹⁹

Shortly after the misidentification was found and confirmed, the FBI convened a 2-day session with an international panel of fingerprint experts to determine what went wrong, and to provide recommendations for changes to FBI fingerprint procedures. The panel met in June 2004. Several panelists expressed the view that the initial examiner had failed to conduct a complete examination, causing him to disregard important differences between the known and questioned samples. Several panelists cited

⁹⁷ Federal Bureau of Investigation, Press Release, "Statement on Brandon Mayfield Case" (24 May 2004), online: <<http://www.fbi.gov>>.

⁹⁸ *Ibid.* This was later disputed by the Office of the Inspector General. See "War on Error: Feds pay out millions to wrongfully accused terror suspects", *Daily Mail* (21 March 2011), online: <<http://www.dailymail.co.uk>>.

⁹⁹ *Ibid.*

overconfidence and the pressure of working on a high-profile case. Some felt that the independent verification had been “tainted” by knowledge of the initial examiner’s conclusion.¹⁰⁰

The Justice Department’s independent review was undertaken by the Office of the Inspector General (OIG). It was conducted by a team of attorneys who interviewed approximately 70 persons, reviewed all of the thousands of pages of documents, and consulted with three distinguished latent fingerprint examiners from outside the FBI lab.¹⁰¹ The resulting 330-page report was critical in many different ways, but started with a clear suggestion that the Bureau’s lab had become a bit too confident in its work:

The misidentification of LFP 17 was a watershed event for the FBI Laboratory, which has described latent fingerprint identification as the “gold standard for forensic science.” Many latent fingerprint examiners have previously claimed absolute certainty for their identifications and a zero error rate for their discipline.¹⁰²

The OIG concluded that several factors had fueled the misidentification. First, the examiners failed to apply a rigorous application of several widely-accepted principles of fingerprint identification: for instance, they applied “circular reasoning”, allowing details visible in the known prints to be seen in the somewhat murky or ambiguous details of the questioned print when they were not really there. They also accepted a “double touch” explanation for an obvious difference in appearance between the two, when there was insufficient evidentiary support, and in doing so “assumed a remarkable set of coincidences in order to make the identification.”¹⁰³

Underlying the report was a theme of overconfidence if not a touch of arrogance on the part of the FBI lab: Spanish experts had concluded that the two sets of prints did not match; in the face of that, “the FBI examiners declared that they were ‘absolutely confident’ in their identification *even*

¹⁰⁰ US, Department of Justice, Office of the Inspector General, *A Review of the FBI’s Handling of the Brandon Mayfield Case*, (2006) at 3–4, online: <<http://www.justice.gov>>.

¹⁰¹ *Ibid* at 4.

¹⁰² *Ibid* at 269.

¹⁰³ *Ibid* at 269–70.

before determining the basis of the [Spanish lab's] disagreement." The OIG "concluded that the FBI Laboratory's overconfidence in its examiners prevented it from taking the [Spanish lab's] results as seriously as it should have."¹⁰⁴

Less convincingly, the OIG concluded that the FBI examiners and the fourth court-appointed expert all became "confused" by the fact that the questioned print contained as many as 10 points that corresponded to details in Mayfield's known fingerprints. The report said that "[t]his degree of similarity is extraordinarily rare", despite the fact that several countries require even more points of comparison than that: e.g., France (16); Australia (12);¹⁰⁵ and Canada (10/12).¹⁰⁶ In England, the historical standard was 12, altered to 16 in 1924 by the Metropolitan Police, and then accepted as a national standard of 16 in 1953. A non-numerical standard was adopted in England in 2001—something which, at least in part, prompted the England and Wales Court of Appeal in 2011 to call for a comprehensive review of quality standards and accountability systems in fingerprint examinations.¹⁰⁷ That work is presently underway.¹⁰⁸

4. THE NATIONAL ACADEMY OF SCIENCES REPORT (2009)

The NAS¹⁰⁹ agreed that the "friction ridge analysis", as analysis of prints is known, "consists of experience-based comparisons of the impressions left by the ridge structures of [hand and feet] surfaces."¹¹⁰ Comparisons are subject to a number of variables that fall to the examiner to consider, including: the

¹⁰⁴ *Ibid* at 270 [emphasis added].

¹⁰⁵ Pyrek, *supra* note 2 at 276.

¹⁰⁶ The general practice in Canada is to chart 10 points of comparison for demonstration in court—though there may, in fact, have been more. "It has been accepted by the courts that ten or twelve points of comparison establish identity beyond all chance of error": Chayko & Gulliver, *supra* note 84 at 471 (authored by Herb Durand, then the Inspector in charge of the Identification Section of the Ottawa Carleton Regional Police, with 20 years' experience in the identification field).

¹⁰⁷ *R v Smith*, [2011] EWCA Crim 1296 at para 62, [2011] 2 Cr App Rep 174.

¹⁰⁸ UK, Home Office, Forensic Science Regulator, *Developing a Quality Standard for Fingerprint Examination* (2011), online: <<https://www.gov.uk>>.

¹⁰⁹ For the background to this organization, see *supra* note 16.

¹¹⁰ NAS, *supra* note 17 at 136.

condition of the skin; type of residue; mechanics of touch; and the nature of the surface touched.¹¹¹ And while computer databases can be used in some situations, the assessment of latent prints from rough-and-tumble crime scenes is based largely on human interpretation, which requires a number of subjective assessments throughout.¹¹²

The NAS was sharply critical of some of the current practices and assumptions of fingerprint examiners: claims of zero error rates were not scientifically plausible; guards against bias were inadequate; and two critical presumptions—that fingerprints were unique to each person and persisted unchanged throughout a lifetime—lacked a proper scientific basis.¹¹³ More seriously, the NAS criticized the ease with which examiners explained away differences between known and unknown prints, stating that

[c]urrently, distortion and quality issues are typically based on “common sense” explanations or on information that is passed down through oral tradition from examiner to examiner. A criticism of the latent print community is that the examiners can too easily explain a “difference” as an “acceptable distortion” in order to make an identification.¹¹⁴

The NAS concluded that more research was required to underpin the process of fingerprint identification; that would, the Academy said, “provide examiners with a solid basis for the intuitive knowledge they have gained through experience . . . and provide the courts with additional information to consider when evaluating the reliability of the science.”¹¹⁵

5. THE SCOTTISH FINGERPRINT INQUIRY (2011)

Failed expectations often lead to a demand for public accountability. Against the backdrop of the forensic miscarriage in the case of Brandon Mayfield, the Scottish Executive ordered a judicial inquiry in 2008 into the bizarre if not insoluble case of Shirley McKie, a serving police officer who successfully fought an accusation that a fingerprint attributed to her had

¹¹¹ *Ibid* at 137.

¹¹² *Ibid* at 139, 270.

¹¹³ *Ibid* at 142–44.

¹¹⁴ *Ibid* at 145.

¹¹⁵ *Ibid* at 144. The FBI have started this process. See Ulery et al, *supra* note 81.

been found at a crime scene to which she had been refused entry.¹¹⁶ The facts of the case can only serve to further erode the “gold standard” mantle that fingerprint examinations have traditionally been accorded. Briefly, the background is this.

In May 1997, David Ashbury was convicted of murdering Marion Ross. During the investigation, a fingerprint was found on the doorframe of the bathroom in Ms. Ross’s house. Examiners identified it as belonging to Shirley McKie, one of the officers involved in the investigation. During the murder trial, McKie denied that the fingerprint (known as “Y7”) was hers. After the trial, McKie was charged with perjury.¹¹⁷

At McKie’s trial, defence fingerprint experts convincingly demonstrated that Y7 was not her fingerprint. Although Scottish law permits a majority verdict in a jury trial, and even permits a verdict of “not proven” as distinct from one of not guilty,¹¹⁸ the jury empanelled in McKie’s case *unanimously* found her *not guilty* of perjury. The jury was clearly satisfied that the fingerprint examiners had simply got it wrong.

The issue of McKie’s fingerprint remained controversial over the next several years. On 14 March 2008 the Scottish Government announced a public judicial inquiry into the matter, chaired by retired Lord Justice Sir Anthony Campbell, formerly one of the most senior appellate judges in Northern Ireland.¹¹⁹ His terms of reference were, at the same time, both simple and far-reaching:

¹¹⁶ The Scottish Government, News Release, SE1838/2000, “Statement by Jim Wallace on Shirley McKie Case” (22 June 2000), online: <<http://www.scotland.gov.uk>>.

¹¹⁷ These facts are outlined on the official website of the resulting public inquiry led by Sir Anthony Campbell, a retired appeal court judge from Northern Ireland. See Finger Print Inquiry Scotland, online: <<http://www.thefingerprintinquiryScotland.org.uk>>.

¹¹⁸ See David M Walker, *The Scottish Legal System: An Introduction to the Study of Scots Law*, 7th ed (Edinburgh: W Green, 1997); *Scots Law – Criminal Courts and Procedure*, online: The Scottish Government <<http://www.scotland.gov.uk>>.

¹¹⁹ UK, SP, *Written Statement to Parliament*, sess 3, SW3-10920 (14 March 2008) (Kenny MacAskill, MSP, Justice Secretary), online: <<http://www.thefingerprintinquiryScotland.org.uk>>; The Scottish Government, News Release, “Inquiry judge and remit announced” (14 March 2008), online: <<http://www.scotland.gov.uk>>.

to inquire into the steps that were taken to identify and verify the fingerprints associated with, and leading up to, the case of *HM Advocate v McKie* in 1999

to determine, in relation to the fingerprint designated Y7, the consequences of the steps taken, or not taken

to report findings of fact and make recommendations as to what measures might now be introduced, beyond those that have already been introduced since 1999, to ensure that any shortcomings are avoided in the future.¹²⁰

Oral hearings at the inquiry began in June 2009. Eighty-eight witnesses testified, and of those, 64 gave oral evidence during approximately 250 hours of hearings over 57 days. The inquiry concluded on 16 December 2009.

In 2011, the Chairman published his report. He concluded that the fingerprints attributed to Ms. McKie had been misidentified. He found no conspiracy among the police officers and that there had been no impropriety on the part of the fingerprint examiners, because the opinions they reached were genuinely held by them. He declined to discredit fingerprint evidence generally, and found that “[t]here is no reason to suggest that fingerprint comparison in general is an inherently unreliable form of evidence but practitioners and fact-finders alike require to give due consideration to the limits of the discipline.”¹²¹

He did, however, make a number of recommendations. The following are some of the key ones. First, fingerprint evidence should be recognized as opinion evidence, not as fact; and those involved in the criminal justice system need to assess it as such on its merits. Second, examiners should discontinue reporting conclusions on identification or exclusion with a claim to 100% certainty or on any other basis suggesting that fingerprint evidence is infallible. Third, examiners should receive training that emphasizes that their findings are based on personal opinion, which is influenced by a series of factors. Fourth, explanations for any *differences* between a mark and a print should be cogent if a finding of identification is

¹²⁰ *Ibid.*

¹²¹ UK, *The Fingerprint Inquiry Report*, vol 1 (Edinburgh: APS Group Scotland, 2011) at 739, online: <<http://www.thefingerprintinquiryscotland.org.uk>>.

to be made. And, fifth, a finding of identification should not be made if there is an unexplained difference between a mark and a print.¹²²

To sum up: few people seriously doubt that fingerprints can serve, and historically have served, as a highly discriminating identifier. Digital photographs and vast computer databases point to the probability that this identification technique will in future be even more significant than it has in the past.

However, as DNA quickly establishes itself as the new gold standard, the continued validity, accuracy, and scientific basis for many of the forensic sciences have been called into question. Not surprisingly, the anxiety level increases where, as in the case of fingerprint examinations, the fact-finding processes in certain high-profile cases dependent solely on fingerprint evidence were taken off course, resulting in miscarriages of justice. Overconfidence on the part of examiners has made this situation worse.

Fingerprint validation studies still do not exist.¹²³ At least one scholar has suggested that this state of affairs is deliberate: Simon Cole argues that because, under present jurisprudence, fingerprint evidence is presumed reliable and admissible, latent print examiners “have nothing to gain and everything to lose from validation studies.”¹²⁴ Instead, examiners rely on jurisprudence, treatises, and anecdotal information in support for two fundamental, but scientifically unproven assumptions: the uniqueness of fingerprints, and their permanence.¹²⁵ Concerning these assumptions, Cole contends that the rhetoric may simply not meet the reality:

This review points to two unpalatable conclusions. The first is that many practitioners and defenders of forensic fingerprint identification still do not understand what is meant by the demand for validation studies, still believe that uniqueness is the fundamental empirical question necessary to validate forensic fingerprint identification, and still believe in the fallacy that casework comprises validation. The second is that the misunderstanding may be deliberate. Historically, fingerprint evidence has

¹²² *Ibid.* The Report actually named 10 “key recommendations”; these five seem to be the ones most applicable in Canada.

¹²³ Cole, *supra* note 89 at 129. They may, however, be starting. For the somewhat modest validation study undertaken by the FBI, see Ulery et al, *supra* note 81.

¹²⁴ Cole, *supra* note 89 at 129.

¹²⁵ Pyrek, *supra* note 2 at 277, 280–81.

benefited enormously from courts' willingness to construe the assumption of uniqueness as evidence of accuracy. The literature reviewed here may intentionally be seeking to perpetuate that fallacy. Until all parties come to some agreement about what are the relevant empirical questions surrounding latent print identification, the fingerprint challenge will be mired in rhetorical claims that fly past one another.¹²⁶

This presents a dilemma: any serious search for an underlying scientific basis will be met with disappointment. Yet the popular and judicial intuitions that underlie fingerprint examinations are powerful. The technique continues to have enormous authority where it counts—in the courts, and with the public. Dislodging a popular commitment of this sort will require a wealth of focused and convincing evidence—enough to withstand the inevitable conclusion that if fingerprinting falls, so will a great deal of other evidence now considered to be reliable and admissible.¹²⁷

The answer may lie in *dicta* outlined by the Ontario Court of Appeal in 2009.¹²⁸ There, the trial judge focused on whether the proffered expert evidence had indicia of reliability, measurable error rates, peer review, the use of random sampling, and the ability of the tester to replicate his or her results.¹²⁹ Concluding that “scientific validity” is not a condition precedent to the admissibility of expert opinion evidence, and that most expert evidence routinely heard and acted upon in the courts cannot be scientifically validated, Doherty JA said this on behalf of the unanimous Court:

It is not surprising that Dr. Totten's opinion could not pass scientific muster. While his research, and hence his opinion, could be regarded as scientific in the very broad sense of that word, as used in McIntosh, Dr. Totten did not pretend to employ the scientific method and did not depend on adherence to that methodology for the validity of his conclusions. As his opinion was not the product of scientific inquiry, its reliability did not rest on its scientific validity. Dr. Totten's opinion flowed

¹²⁶ Cole, *supra* note 89 at 130–31 [citation omitted].

¹²⁷ See generally Pyrek, *supra* note 2 at 277–78.

¹²⁸ *R v Abbey*, 2009 ONCA 624, 97 OR (3d) 330, Doherty JA, on behalf of the unanimous court [*Abbey*].

¹²⁹ *Ibid* at para 104.

from his specialized knowledge gained through extensive research, years of clinical work and his familiarity with the relevant academic literature. It was unhelpful to assess Dr. Totten's evidence against factors that were entirely foreign to his methodology. As Professors Sales and Shuman put it: "[f]or non-scientific expert testimony, scientific validity is an oxymoron".¹³⁰

In years to come, the forensic fingerprint examiner community will consider the implications of the NAS and Scottish Fingerprint Inquiry report, and other related studies. Those disciplines may eventually be able to provide much needed guidance on issues of standards and accountability mechanisms. Regardless, in the end it will fall to the fingerprint examiner community to ensure that the legal profession and the judiciary can continue to have confidence in fingerprint evidence, without fear that later developments in a case may demonstrate that facts originally relied upon in court were wrong, and that the course of justice was inadvertently taken off the rails, resulting in a miscarriage of justice.

C. FORENSIC PATHOLOGY

Forensic pathologists investigate and physically examine persons who die a sudden, unexpected, suspicious, or violent death. They examine the dead to identify the class of injury, collect medical evidence, determine the presence or absence of natural disease, and determine the cause of death.¹³¹ It has been said that they are "medical detectives" with two primary tasks: identify and document pathological findings; then assist the state's legal systems, particularly the criminal justice system, in understanding how death occurred by explaining the relevant pathology.¹³²

Forensic pathology remains, however, an inexact science. Its accuracy is particularly susceptible to subjective assessments and changes in expert views.¹³³ Three aspects of forensic pathology are critically important, and need to be highlighted at the outset of this discussion.

¹³⁰ *Ibid* at para 108 [citation omitted].

¹³¹ NAS, *supra* note 17 at 256–57; *Inquiry into Pediatric Forensic Pathology in Ontario Report*, vol 1 (Toronto: Ontario Ministry of the Attorney General, 2008) at 8 [Goudge Report 1].

¹³² NAS, *supra* note 17 at 244; Goudge Report 1, *supra* note 131 at 8.

¹³³ See *ibid* at 9–10; Sangha, Roach & Moles, *supra* note 1 at 285–86.

First, forensic pathology is a dynamic, evolving science. Theories and diagnoses once thought to be sound may subsequently be questioned or even rejected.¹³⁴ Second, even within the forensic pathology community, there are invariably issues of significant controversy and debate. As forensic pathology evolves and re-morphs, pathologists debate whether new discoveries or research should properly cast doubt on previously held theories, or should modify the level of confidence with which those earlier opinions are to be held.¹³⁵ These controversies and debates are particularly evident in pediatric forensic pathology.¹³⁶ Third, it is critically important to understand that forensic pathology is an interpretive science, often with limitations on the conclusions that it can properly offer the criminal justice system.¹³⁷ Findings observed during an autopsy are especially open to interpretation; indeed, a pathologist's opinion on the ultimate issue—the cause of death—will often involve a degree of interpretation.¹³⁸

These three factors underscore the limitations of the science. They reinforce the notion that a forensic pathologist must take care in assessing what he or she can reasonably say about an individual case. They also require the expert to consider the level of confidence or certainty with which he or she can express a view.¹³⁹ And they invite scrutiny and cross-examination by defence counsel.

The evolution in medical views that has taken place over the past two decades, particularly in pediatric forensic pathology, has generated intense controversy in the United Kingdom, Canada, and, to a lesser extent, the United States. Nowhere is that more pronounced than in relation to the so-called “Shaken Baby Syndrome”, where the controversy that has arisen has exposed a disturbing string of wrongful convictions in all three countries.

¹³⁴ *Inquiry into Pediatric Forensic Pathology in Ontario Report*, vol 2 (Toronto: Ontario Ministry of the Attorney General, 2008) at 69 [Goudge Report 2].

¹³⁵ *Ibid* at 71.

¹³⁶ *Ibid*.

¹³⁷ *Ibid* at 69.

¹³⁸ *Ibid* at 73.

¹³⁹ *Ibid*.

There was an extended period of time, however, where that diagnosis was well-entrenched and not at all controversial. That deserves close consideration, following which the pathway to the present time will be examined.

1. THE RISE OF SHAKEN BABY SYNDROME AS A WELL-ACCEPTED MEDICAL DIAGNOSIS

Shaken Baby Syndrome (SBS) describes a head injury in an infant caused by violent shaking.¹⁴⁰ Three pathology findings, referred to almost universally as the “triad”, have traditionally been considered diagnostic of SBS:¹⁴¹

- a) Subdural hemorrhages (usually, a thin layer of blood between the brain and the skull);
- b) Retinal hemorrhages (bleeding within the back part of the eye); and
- c) Hypoxic-ischemic encephalopathy (low oxygen injury to the brain that causes swelling).

The origins of SBS can be traced back to 1962, when Dr. Henry Kempe wrote a very influential article on the common characteristics of “battered” children.¹⁴² In this article, he listed several physical injuries that he argued were suspicious for child abuse. Most made good sense, such as broken bones and bruises. But he also included subdural hematoma, a pooling of blood between the brain and the protective dura layer, which Dr. Kempe contended was often a trauma-induced injury. Over time, Dr. Kempe’s article formed the foundation for the modern intersection between the

¹⁴⁰ *Ibid* at 69.

¹⁴¹ See *Committee Report to the Attorney General: Shaken Baby Death Review* (Toronto: Ontario Ministry of the Attorney General, 2011) at 7, online: <<http://attorneygeneral.jus.gov.on.ca>> [2011 Report to the Attorney General]; Goudge Report 2, *supra* note 134 at 69.

¹⁴² Henry Kempe et al, “The Battered-Child Syndrome” (1962) 181:1 *Journal of the American Medical Association* 17. Much of the historical material in this section has been drawn from the outstanding 230-page petition filed on behalf of Drayton Shawn Witt on 17 February 2012 in the Superior Court of the State of Arizona. Mr. Witt’s case is discussed later in this paper. See *infra* note 201 ff.

medical assessment of abused children and the criminal prosecution of those suspected of the abuse.¹⁴³

A decade later, in 1971, Dr. A. Norman Guthkelch, Britain's first pediatric neurosurgeon, wrote an article that raised this question: Why do infants who present with subdural hematoma, for whom there is a strong suspicion of abuse, often show no signs of trauma to their head?¹⁴⁴ He noted a study in which two subjects had sustained whiplash injuries as a result of an automobile accident, without any trauma to the head. He also discussed two of his own infant patients who had subdural hematomas, yet showed no sign of head trauma, where the mothers conceded that they may have shaken the baby. On the basis of these four cases, Dr. Guthkelch hypothesized that infants could sustain injuries similar to whiplash, including subdural hematoma, from being shaken violently.

This theory gained considerable momentum when Dr. John Caffey, a prominent American pediatric radiologist and textbook author, published two articles in the 1970s in which he concluded that the existing evidence, though "meager" and "incomplete", "indicat[e] that manual whiplash shaking of infants is a common primary type of trauma in the so-called *battered infant syndrome*. It appears to be the major cause in these infants who suffer from subdural hematomas and intraocular bleedings."¹⁴⁵ He called the phenomenon the "whiplash shaken infant syndrome" and urged that a national education campaign be undertaken.¹⁴⁶

¹⁴³ Deborah Tuerkheimer, "The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts" (2009) 87:1 Wash L Rev 1 at 5. This article is reprinted in part in Diane Kiesel, *Domestic Violence: Law, Policy, and Practice*, 2010-11 Supplement (np: Matthew Bender & Company, 2011) at 53-63.

¹⁴⁴ AN Guthkelch, "Infantile Subdural Haematoma and its Relationship to Whiplash Injuries" (1971) 2 British Medical Journal 430 [Guthkelch, "Infantile Haematoma"].

¹⁴⁵ John Caffey, "The Whiplash Shaken Infant Syndrome: Manual Shaking by the Extremities With Whiplash-Induced Intracranial and Intraocular Bleedings, Linked With Permanent Brain Damage and Mental Retardation" (1974) 54 Pediatrics 396 at 402 [emphasis in original] [Caffey, "Whiplash"]. See also John Caffey, "On the Theory and Practice of Shaking Infants: Its Potential Residual Effects of Permanent Brain Damage and Mental Retardation" (1972) 124:2 American Journal of Diseases of Children 161.

¹⁴⁶ Caffey, "Whiplash," *supra* note 145 at 403.

Shortly after Caffey's papers were published, during the late 1970s and throughout the 1980s, his theory "became widely accepted in both medical and legal circles."¹⁴⁷ By the 1990s, "SBS" had become an entrenched diagnosis within the medical community.¹⁴⁸ Indeed, well into the 21st century it was accepted virtually without question by Canadian courts at both the trial and appellate levels.¹⁴⁹

One point is important to remember. SBS is, by its very definition, a diagnosis of violent shaking. The triad of symptoms is exclusively diagnostic of child abuse.¹⁵⁰ If the baby dies, an SBS diagnosis is tantamount to a medical diagnosis of homicide.¹⁵¹ It actually gets worse. Absent witnessed abuse, where the constellation of these three findings¹⁵² is present, and the caregiver cannot provide a reasonable explanation for the child's condition, the caregiver is often charged criminally. To put a finer point on it, the accusing finger is usually pointed at *the last person with the baby*.¹⁵³ In the

¹⁴⁷ Edward J Imwinkelried, "Shaken Baby Syndrome: A Genuine Battle of the Scientific (and Non-Scientific) Experts" (2010) 46:1 Criminal Law Bulletin 156 at 165.

¹⁴⁸ Tuerkheimer, *supra* note 143 at 5.

¹⁴⁹ See e.g. the following criminal and civil cases, literally from one end of Canada to the other: *R v Marks* (1994), 121 Nfld & PEIR 200, 91 CCC (3d) 421 (NLCA); *R v Pashe*, 100 Man R (2d) 61, 1995 CanLIIii 6256 (CA); *Brown v University of Alberta Hospital* (1997), 197 AR 237, 145 DLR (4th) 63 (QB); *Saskatchewan (Minister of Social Services) v N(S)*, 1998 CanLII 13946, 1998 CarswellSask 829 (WL Can) (QB); *Re SS*, 1999 ABPC 109, 1999 CarswellAlta 1668 (WL Can); *R v JM*, 2001 CanLII 26418, 2001 CarswellMan 657 (WL Can) (Prov Ct) [*R v JM* cited to CanLII]; *R v Carle*, 2001 BCPC 148, 2001 CarswellBC 1430 (WL Can); *R v Stewart*, 2002 NSSC 290, 212 NSR (2d) 250. Crown reliance on this theory continued as late as 2007. See *Alcius c R*, 2007 QCCA 216, 226 CCC (3d) 544.

¹⁵⁰ Tuerkheimer, *supra* note 143 at 4.

¹⁵¹ Usually, this type of homicide is charged as unlawful act manslaughter under the *Criminal Code*, *supra* note 73, s 222(5)(a). See *R v Creighton*, [1993] 3 SCR 3, 105 DLR (4th) 632; *R v DeSousa*, [1992] 2 SCR 944, 95 DLR (4th) 595. However, in some instances the charge could be murder. See e.g. *R v Mullins-Johnson*, 2007 ONCA 720, 87 OR (3d) 425 [*Mullins-Johnson*]. See generally Tuerkheimer, *supra* note 143 at 5; Sangha, Roach & Moles, *supra* note 1 at 285–86.

¹⁵² As outlined in *supra* note 141 and accompanying text.

¹⁵³ See 2011 Report to the Attorney General, *supra* note 141 at 8–9; Goudge Report 1, *supra* note 131 at 4. See e.g. *Mullins-Johnson*, *supra* note 151.

hands of a prosecutor, SBS alone is able to establish all of the essential elements of the offence: the cause of death; intent to harm; identity of the perpetrator; and the location and timing of the offence. Uniquely in the criminal law, both the *actus reus* and *mens rea* of the offence can be established by the science itself.¹⁵⁴

A case tried in Manitoba in 2001 illustrates the point.¹⁵⁵ The accused, J.M., was a 17-year-old male who was babysitting an infant. While in his care, the infant stopped breathing. The child was taken to hospital and died a few days later. J.M. was charged with manslaughter “because it was determined at autopsy that the infant died of Shaken Infant Syndrome, SIS [now known as SBS].”¹⁵⁶ At the conclusion of a 2-week trial, the defence conceded and the Court found that the infant had died of SIS. The remaining question was: who shook the baby?

The trial judge (now a justice of the Court of Appeal for Manitoba) concluded that there were two key issues: first, did the accused have the opportunity to shake the baby? If he did, but there was nothing further to inculcate the accused, the evidence will fall short unless the accused had “exclusive opportunity” to commit the offence and could not explain what had occurred. Here the evidence showed that the accused was alone with the child except for another toddler who, the Court found, could not have committed the offence. Finding the accused guilty of manslaughter, the trial judge concluded as follows:

I am convinced beyond all reasonable doubt that the victim received the non-accidental trauma during the period of time when the young offender had *exclusive opportunity*. *The Crown has presented a strong case that cries out for an explanation. I have concluded that the cumulative effect of the unanswered evidence persuades me beyond a reasonable doubt that the young offender is guilty of manslaughter.*¹⁵⁷

The case proceeded in lock-step fashion: did the medical evidence show that the triad was present? If so, death was caused by non-accidental

¹⁵⁴ Tuerkheimer, *supra* note 143 at 5.

¹⁵⁵ *R v JM*, *supra* note 149.

¹⁵⁶ *Ibid* at 2.

¹⁵⁷ *Ibid* at 6–7 [emphasis added].

trauma. Who was present? Did that person have exclusive opportunity to inflict the trauma? If so, did that person provide an explanation for the death? If not, that person is responsible for the death and guilty of homicide. The starting point, however, was the triad; everything else flowed from that.

2. THE FALL OF SHAKEN BABY SYNDROME AS AN ACCEPTED MEDICAL DIAGNOSIS

The SBS hypothesis reached its zenith around 2001.¹⁵⁸ But, even before then, it had started to wobble. The debate commenced in 1987, when Dr. Ann-Christine Duhaime reviewed the biomechanics involved and contended that “the forces required to produce the triad were not reproducible in experimental models of shaking.”¹⁵⁹ In 2001, a British neuropathologist, Dr. Jennian Geddes, published a paper suggesting that the view that shaking directly caused the triad “require[s] fresh examination”.¹⁶⁰ Her views were attacked by the child abuse protection community on the basis that they were not supported by data other than her own, and that her articles advanced “junk science”.¹⁶¹ That same year, a forensic pathologist in the United States challenged existing dogma that the triad could not be caused by falls unless they exceeded ten feet. He described multiple witnessed short falls that resulted in some or all of the triad injuries, including a *videotaped* 28-inch fall by a toddler, who, after the fall, showed all of the SBS symptoms, then died.¹⁶²

¹⁵⁸ See the cases referred to in *supra* note 149.

¹⁵⁹ Goudge Report 2, *supra* note 134 at 70. The Report does not cite which of Dr. Duhaime’s articles contained this finding, but most likely it was Ann-Christine Duhaime et al, “The Shaken Baby Syndrome: A Clinical, Pathological, and Biomechanical Study” (1987) 66:3 *Journal of Neurosurgery* 409. Dr. Duhaime is presently the Director of Pediatric Neurosurgery at Massachusetts General Hospital.

¹⁶⁰ JF Geddes, “Neuropathology of Inflicted Head Injury in Children II: Microscopic Brain Injury in Infants” (2001) 124:7 *Brain* 1299 at 1305.

¹⁶¹ Robert W Block, “To the Editor” (2004) 113:2 *Pediatrics* 432; Jerold F Lucey, “In Reply” (2004) 113:2 *Pediatrics* 432.

¹⁶² John Plunkett, “Fatal Pediatric Head Injuries Caused by Short-Distance Falls” (2001) 22:1 *American Journal of Forensic Medicine and Pathology* 1 at 2–7. It should be noted, however, that the UK Court of Appeal has been critical of some aspects of

By 2002, other disciplines had weighed in on the emerging controversy. An impressive group of biomechanics published a detailed study that launched a direct attack on the theories advanced earlier by Guthkelch and Caffey. Biomechanical engineers, unlike physicians, focus on the exertion of forces on the human body and the body's tolerance to such forces. One author had published the very study on whiplash that had been relied upon by Guthkelch and Caffey in their seminal works on SBS; this group contended that the hypothesis of retinal hemorrhage by shaking had not been tested, and that the level of force required for bleeding to occur by shaking to the point of damaging the eye was biomechanically improbable.¹⁶³

Over the next several years, the SBS theory was further examined from several different perspectives. Its foundation crumbled further. In 2003, Dr. Mark Donohoe examined whether SBS met the test of "evidence-based medicine", as distinct from medical practice based heavily on anecdote and historical practice. He reviewed all 55 published articles on SBS to 1998 and concluded that "there was inadequate scientific evidence to come to a firm conclusion on most aspects of causation, diagnosis, treatment, or any other matter pertaining to SBS."¹⁶⁴ The following year, Dr. Patrick Lantz noted that emerging literature suggested that retinal hemorrhages in infants should not necessarily be diagnostic of SBS, and that the "vested dogma" that the trauma of shaking causes retina hemorrhages "is a faith-based assumption, not a scientific fact."¹⁶⁵

Evidence-based analyses challenging the underpinnings of SBS continued unabated in the years that followed. In 2005, a biomechanical engineer published a study that demonstrated that the levels of force

Dr. Plunkett's study and conclusions. See *R v Harris & Ors*, [2005] EWCA Crim 1980, [2006] 1 Cr App Rep 5 [*Harris*].

¹⁶³ AK Ommaya, W Goldsmith & L Thibault, "Biomechanics and Neuropathology of Adult and Paediatric Head Injury" (2002) 16:3 *British Journal of Neurosurgery* 220.

¹⁶⁴ Mark Donohoe, "Evidence-Based Medicine and Shaken Baby Syndrome: Part I: Literature Review, 1966–1998" (2003) 24:3 *American Journal of Forensic Medicine and Pathology* 239 at 241.

¹⁶⁵ PE Lantz et al, "Evidence Based Case Report: Perimacular Retinal Folds from Childhood Head Trauma" (2004) 328 *British Medical Journal* 754; Patrick Lantz, "To the Editor" (2004) 114:1 *Pediatrics* 330 at 330.

required to shake a healthy infant hard enough to produce subdural injury would invariably exceed the tolerance of the infant neck. This was important because neck failures are often absent in SBS cases.¹⁶⁶ That same year, the England and Wales Court of Appeal (Criminal Division) observed that the mere presence of the triad did not automatically lead to a diagnosis of SBS, or a conclusion of unlawful killing. Rather, the Court found, all of the facts of the case must be taken into account.¹⁶⁷

By 2006, a prominent neuropathologist at Northwestern University expressed concern that the medical community's general acceptance of SBS theory had stifled studies into other potential causes of the SBS triad.¹⁶⁸ In the following year, 2007, Dr. Patrick Barnes published a lengthy paper that detailed known *non-traumatic causes that actually mimic SBS*.¹⁶⁹

Finally, Dr. A. Norman Guthkelch, whose 1971 article helped propel the SBS theory into the international limelight, took the position in 2012 that a diagnosis of non-accidental death, such as SBS, was not justified when the only evidence of abuse was the triad. He added that, on his review of the recent literature, “the hypothesis that the triad can be caused only by shaking or shaking plus impact is still open to serious doubt. We know that a number of other conditions—natural and non-accidental—may lead to the triad.” Noting Dr. Barnes's work on conditions that can mimic SBS, he emphasized that “cases of infant deaths where child abuse is suspected must be individually examined”, including an examination of “the

¹⁶⁶ Faris A Bandak, “Shaken Baby Syndrome: A Biomechanics Analysis of Injury Mechanisms” (2005) 151:1 *Forensic Science International* 71. For instance, findings of neck or spinal failure did not present in the case of Drayton Shawn Witt. See “Defendant's Memorandum in Support of Petition for Post-Conviction Relief”, 17 February 2012, *Arizona v Witt*, No CR2000-017311 (*Ariz Sup Ct* 2012), online: Lewis Roca Rothgerber LLP <<http://www.lrrlaw.com>> [*Witt*, “Petition”].

¹⁶⁷ *Harris*, *supra* note 162 at paras 70, 152, 175. Note that the Court preferred the term “non-accidental head injury (NAHI)” over “SBS” (*ibid* at para 56), but the accepted hypothesis is the same.

¹⁶⁸ Jan E Leestma, “‘Shaken Baby Syndrome’: Do Confessions by Alleged Perpetrators Validate the Concept?” (2006) 11:1 *Journal of American Physicians and Surgeons* 14 at 15–16.

¹⁶⁹ Patrick D Barnes & Michael Krasnokutsky, “Imaging of the Central Nervous System in Suspected or Alleged Nonaccidental Injury, Including the Mimics” (2007) 18:1 *Topics in Magnetic Resonance Imaging* 53.

infant's medical history, clinical, radiological and laboratory evidence, consideration of a differential diagnosis to rule out other causes, and all other relevant evidence."¹⁷⁰

In late 2012, Dr. Guthkelch published what he referred to as his "swan song" on this issue. In it, he argued that both medical science and the law had gone too far in criminalizing apparent acts of violence where the only evidence was the changed clinical state of the infant. In his view, there had been insufficient attention to whether the death might have resulted from natural causes, and it was inappropriate to assume criminal intent "simply because signs of the classic SBS triad have been found or because no one can think of any other explanation of the infant's injuries."¹⁷¹

The stage was thus set: there were growing international concerns over the very foundation underlying SBS. In the United Kingdom, Canada, and the United States it was becoming increasingly apparent that a number of prosecutions commenced in the 1980s and 1990s might have been led seriously astray by faulty forensic pathology. Major developments in those countries were about to cause the SBS to take a serious international nosedive.

(a) *In the United Kingdom*

In several cases arising during the peak of the SBS movement, moms, dads, and babysitters in England were charged and convicted for killing children in their care.¹⁷² In each instance, the case for the prosecution

¹⁷⁰ This position was outlined in a deposition entered into in the case of Drayton Shawn Witt. See "Declaration of A Norman Guthkelch, MD" 3 February 2012, *Arizona v Witt*, No CR2000-017311 (Ariz Sup Ct 2012) at paras 5–7, online: Lewis Roca Rothgerber LLP <<http://www.lrrlaw.com>> [*Witt*, "Guthkelch Declaration"].

¹⁷¹ AN Guthkelch, "Problems of Infant Retino-Dural Hemorrhage With Minimal External Injury" (2012) 12:2 *Houston Journal of Health Law & Policy* 201. The following year, 2013, Dr. Guthkelch, at 97 years of age, is reported to have said that he wants to do "what I can to straighten this out before I die": Sue Luttner, "Dr. Norman Guthkelch, Still on the Medical Frontier" (20 February 2013), *On SBS* (blog), online: <<http://onsbs.com>>.

¹⁷² *R v Clark*, [2003] EWCA Crim 1020, [2003] 2 FCR 447; *R v Cannings*, [2004] EWCA Crim 1, [2004] 2 Cr App Rep 7 [*Cannings*]; *Harris*, *supra* note 162. Post-exoneration compensation was considered by the Court of Appeal in one of these cases: *R v Allen*

hinged on the testimony of eminent physicians. The subsequent international change in medical views led to a series of applications to the Court of Appeal, several of which were allowed on the basis that the new evidence made the verdicts unsafe.

Commenting on the shifting sands of expert and medical views, the Court of Appeal made this observation in a much-quoted passage:

The trial, and this appeal, have proceeded in a most unusual context. Experts in many fields will acknowledge the possibility that later research may undermine the accepted wisdom of today. “Never say never” is a phrase which we have heard in many different contexts from expert witnesses. That does not normally provide a basis for rejecting the expert evidence, or indeed for conjuring up fanciful doubts about the possible impact of later research. With unexplained infant deaths, however, as this judgment has demonstrated, in many important respects we are still at the frontiers of knowledge. Necessarily, further research is needed, and fortunately, thanks to the dedication of the medical profession, it is continuing. . . . In cases like the present, if the outcome of the trial depends exclusively or almost exclusively on a serious disagreement between distinguished and reputable experts, it will often be unwise, and therefore unsafe, to proceed.¹⁷³

Underscoring the terribly tragic consequences for a mother who is imprisoned as a result of an expert witness later proved to be wrong, the Court of Appeal concluded as follows:

In a criminal case, it is simply not enough to be able to establish even a high probability of guilt. Unless we are sure of guilt the dreadful possibility always remains that a mother, already brutally scarred by the unexpected death or deaths of her babies, may find herself imprisoned for life for killing them when she should not be there at all. In our community, and in any civilised community, that is abhorrent.¹⁷⁴

(formerly *Harris*), [2008] EWCA Civ 808, [2009] 1 Cr App Rep 2 continued in *Allen v United Kingdom* [GC], No 25424/09, ECHR 2013. For a more detailed consideration of the situation in the UK, see MacFarlane, “Convicting the Innocent”, *supra* note 1 at 458–60.

¹⁷³ *Cannings*, *supra* note 172 at para 178.

¹⁷⁴ *Ibid* at para 179.

It should be noted, however, that in the last of these cases the Court of Appeal made two important observations.¹⁷⁵ First, cases of alleged SBS are fact-specific and should be determined on their individual facts.¹⁷⁶ Second, while the presence of the triad on its own may be a strong pointer to SBS, it does not automatically or necessarily lead to a diagnosis of SBS or to a conclusion of homicide. All the facts of the individual case must be taken into account.¹⁷⁷

In the wake of these cases, and others, Attorney General Lord Goldsmith established two separate reviews to examine the work of a discredited pathologist, and further to consider evolving pediatric forensic pathology and related science (SBS). In 2006, he reported to the House of Lords that there were three convictions that were problematic; and nine SBS cases had previously been referred for review.¹⁷⁸

(b) In Canada: The Goudge Inquiry

Dr. Charles Smith worked from 1981 until 2005 as a pediatric pathologist at Toronto's world-renowned Hospital for Sick Children (SickKids). Despite the fact that he had no training or certification in forensic pathology, he was appointed director of the Ontario Pediatric Forensic Pathology Unit at SickKids.¹⁷⁹ His reputation grew. For more than a decade, Dr. Smith was viewed as one of Canada's leading experts in pediatric forensic pathology, and he was certainly seen as the leading expert in Ontario.¹⁸⁰ No one had the training to take him on, and the mere fact

¹⁷⁵ *Harris*, *supra* note 162.

¹⁷⁶ *Ibid* at para 267.

¹⁷⁷ *Ibid* at paras 70, 152, 175.

¹⁷⁸ UK, HL, Parliamentary Debates, vol 678, col 1079 (14 February 2006). For a discussion of this, see *Inquiry into Pediatric Forensic Pathology in Ontario Report*, vol 3 (Toronto: Ontario Ministry of the Attorney General, 2008) at 518–25 [Goudge Report 3].

¹⁷⁹ Goudge Report 1, *supra* note 131 at 6.

¹⁸⁰ Commissioner Stephen T Goudge, Statement, "Commissioner's Statement on Release of the Report" (1 October 2008) at 2, online: <<http://www.attorneygeneral.jus.gov.on.ca>> [Goudge Statement].

that he walked into court to testify for the prosecution spelled the demise of any cogent medical argument that could be advanced by the defence.¹⁸¹

The reality was that Dr. Smith was incompetent as a pediatric forensic pathologist.¹⁸² He made many serious mistakes. People were jailed as a result. Some warning signals were raised about his competence and professionalism during the 1990s; however, for the most part, they were ignored by those responsible for the oversight of his work.¹⁸³

Finally, in 2005, the new Chief Coroner for Ontario called for a full review of Dr. Smith's work in criminally suspicious cases and homicides undertaken during the 1990s. The results were devastating: in 20 of the 45 cases examined, the independent reviewers took issue with Dr. Smith's opinion in his report or his testimony in court. In 12 of those 20 cases, there had been findings of guilt by the courts.¹⁸⁴ The report delivered a serious blow to public confidence in both pediatric forensic pathology in Ontario, as well as in the central role it often plays in criminal proceedings involving child deaths.¹⁸⁵ Six days later, on 25 April 2007, the Province of Ontario called a Commission of Inquiry to investigate the matter.¹⁸⁶ The Honourable Stephen T. Goudge, a sitting Judge of the Ontario Court of Appeal, was appointed Commissioner. His mandate was twofold: find out

¹⁸¹ Goudge Report 1, *supra* note 131 at 6. See also *R v CM*, 2010 ONCA 690 at para 4, 2010 CarswellOnt 7883 (WL Can) [CM]; *Abbey*, *supra* note 128 at para 64; *R v Sherret-Robinson*, 2009 ONCA 886, [2009] OJ no 5312 (QL) [*Sherret-Robinson*].

¹⁸² On 1 February 2011, the College of Physicians and Surgeons of Ontario (CPSO) revoked Dr. Smith's Certificate of Registration, finding him "incompetent under subsection 52(1) of the [Health Professions Procedural] Code": (*Re*) *CR Smith* (1 February 2011) at 6, online: <<http://www.cpso.on.ca>>. (In an interim decision that has since been removed from the website, the CPSO stated that "in his practice of forensic pediatric pathology and his work providing expert opinion Dr. Charles Smith committed acts of professional misconduct, in that he failed to maintain the standard of practice of the profession in Ontario, engaged in disgraceful, dishonorable or unprofessional conduct, and is incompetent".)

¹⁸³ Goudge Report 1, *supra* note 131 at 6–7.

¹⁸⁴ *Ibid* at 7.

¹⁸⁵ *Ibid*.

¹⁸⁶ *Ibid*.

what “went so badly wrong” and make recommendations to restore and enhance public confidence in pediatric forensic pathology.¹⁸⁷

The Inquiry established two things. First, Dr. Smith had made serious mistakes with terrible consequences for a number of people. Second, there were cases where evolving science cast doubt on opinions previously expressed in court.¹⁸⁸ It is the second finding with which this paper is concerned. Of this state of affairs, Commissioner Goudge said:

The criminal justice system values finality. However, forensic pathology is an evolving science in which controversies exist, and where findings and opinions often require interpretation. This tension underlies much of the discussion in Volume 3 [of the Report]. Moreover, the evolution of scientific knowledge will often be accompanied by controversy—as pathologists debate whether the existing scientific knowledge permits certain opinions to be reasonably formed, and whether new scientific knowledge casts doubt on previously expressed opinions or, at the very least, modifies the levels of confidence with which those opinions can reasonably be expressed.¹⁸⁹

Commissioner Goudge specifically addressed the issue of SBS. Noting that it was “one of the deepest controversies surrounding pediatric forensic pathology,”¹⁹⁰ he observed that the “evolution in forensic pathology in this area” had evolved to the point that “the predominant view is no longer that the triad on its own is diagnostic of SBS. Instead, the issue is fraught with controversy.”¹⁹¹ Significantly, he added that “our systemic examination has identified this particular area of forensic pathology as one where change has raised the real possibility of past error.”¹⁹² In the result, he urged the Government of Ontario to undertake a review of SBS convictions from 1986–2006 on the basis of “[t]he significant evolution in pediatric forensic pathology relating to shaken baby syndrome” and “the concern that, in light of the change in knowledge, there may have been convictions that should

¹⁸⁷ *Ibid* at 6–7.

¹⁸⁸ Goudge Statement, *supra* note 180 at 3, 5.

¹⁸⁹ Goudge Report 1, *supra* note 131 at 9–10.

¹⁹⁰ Goudge Report 3, *supra* note 178 at 527.

¹⁹¹ *Ibid* at 528.

¹⁹² *Ibid* at 531.

now be seen as miscarriages of justice.”¹⁹³ That review was subsequently done, leading to a disconcertingly long list of cases where the Court of Appeal ultimately either acquitted a defendant or ordered a new trial.¹⁹⁴

(c) *In the United States*

Triad-based convictions in the United States continue to be prosecuted and affirmed on appeal; there are, however, some recent signs of change.¹⁹⁵

In a groundbreaking decision, the Wisconsin Court of Appeals held in 2008 that the emergence of a legitimate and significant dispute within the medical community on SBS constituted “newly discovered evidence” sufficient to justify a new trial. The state of the medical evidence, the Court concluded, was such that a trier of fact would inevitably be faced with competing credible medical opinions when assessing whether there was a reasonable doubt as to guilt.¹⁹⁶

An appellate court in Texas took the matter one step further in 2012, holding that where the original Medical Examiner upon whom the prosecution relied at trial re-evaluated his opinion, and essentially recanted

¹⁹³ *Ibid* at 533.

¹⁹⁴ *Mullins-Johnson*, *supra* note 151; *R v Hanemaayer*, 2008 ONCA 580, 234 CCC (3d) 3 [*Hanemaayer*]; *Abbey*, *supra* note 128; *Sherret-Robinson*, *supra* note 181; *CM*, *supra* note 181; *R v CF*, 2010 ONCA 691, 2010 CarswellOnt 7844 (WL Can) [*CF*]; *R v Marquardt*, 2011 ONCA 281, 2011 CarswellOnt 2328 (WL Can) [*Marquardt* 2011]; *R v Kumar*, 2011 ONCA 120, 268 CCC (3d) 369 [*Kumar*]. However, “Dr. Smith cases” will not necessarily lead to a remedy where, for instance, the case did not turn on SBS and the applicant failed to explain skull fractures on the infant. See *R v Simmons*, 2012 ONCA 94, 289 OAC 39 [*Simmons*].

¹⁹⁵ One American commentator has suggested that the United States’s failure to absorb the latest scientific knowledge on SBS has been “halting and inconsistent” for at least three reasons: first, the criminal justice system in that country has remained untouched and insulated from scientific developments elsewhere; second, identifying the factually innocent is complicated because science has not yet established an alternative explanation for SBS deaths and, indeed, no crime may have even been committed in the first place; third, prosecutorial training materials “present a view of the science refracted through an advocate’s lens”: Tuerkheimer, *supra* note 143 at 7, 28, 29.

¹⁹⁶ *Wisconsin v Edmunds*, 746 NW (2d) 590, 2008 WI App 33 (2008) [*Edmunds*]. See also Goudge Report 3, *supra* note 178 at 529; Tuerkheimer, *supra* note 143 at 34.

his original testimony, there existed a material exculpatory fact sufficient to justify a new trial.¹⁹⁷

Dr. Bayardo, who had performed the autopsy of the victim, originally had testified “unequivocally” and “without a scintilla of doubt”, that the cause of the child’s death was a severe head injury, and that the manner of death was homicide. Seventeen years later, he changed his mind, saying that “[b]ased on the physical evidence in the case, I cannot determine with a reasonable degree of medical certainty whether [the infant’s] injuries resulted from an intentional act or an accidental fall.”¹⁹⁸

The Court then turned to this difficult question: Does the evidence demonstrate actual innocence, sufficient to justify an acquittal? Or should there be a new trial of the issue? Opting for the latter, the Court held that at best the critical evidence supporting an intention to cause death had simply been retracted. “The present guilty verdict [was] based on scientifically unreliable evidence,” the Court observed, “but, after another . . . trial, a guilty verdict could be based on scientifically reliable evidence or evidence that forthrightly admits that science cannot resolve the question of either causation or intent.”¹⁹⁹

Emotion inevitably creeps into cases that involve the unexpected and tragic death of a child. Eight judges heard this case on appeal. Five favoured a new trial. Three opposed any remedy whatsoever, making this powerful but caustic observation at the conclusion of their reasons for dissenting: “It is a travesty to grant this child killer relief on some unknown legal principle while her tiny, defenseless victim lies dead and reburied. Therefore I dissent with all the vigor at my command.”²⁰⁰

Some medical examiners in the United States are now reassessing the correctness of SBS opinions they expressed in court during the past few decades. An Arizona case decided in 2012 illustrates how strongly the prevailing medical views have shifted, and how triad-based convictions are now starting to attract the critical attention of the judiciary.

¹⁹⁷ *Ex Parte Cathy Lynn Henderson*, 384 SW (3d) 833 at 837, 2012 Tex Crim App LEXIS 1605 (2012) [*Henderson*].

¹⁹⁸ *Ibid.*

¹⁹⁹ *Ibid* at 849.

²⁰⁰ *Ibid* at 859, Keasler J (Keller PJ and Hervey J, concurring).

In May 2000, baby Steven Witt experienced multiple rounds of seizures, vomiting, pneumonia, emergency room visits, and hospital stays in Phoenix, Arizona.²⁰¹ Steven's father, Drayton, helped care for the 5-month-old infant throughout his period of sickness, was bedside while Steven was in hospital for six days, and was there when Steven passed away in his mother's arms on 2 June 2000. Doctors had been unable to determine the cause of his seizures.

The Medical Examiner began an autopsy on the day that Steven died. His body showed no outward signs of abuse. However, the triad was present. It was 2000 and, as I described earlier,²⁰² the triad of findings in an unresponsive infant inevitably led to one conclusion: the baby had been violently shaken. The Medical Examiner, Dr. A. L. Mosley, reported that the cause of death was "Shaken/Impact Syndrome"; he ruled the case a homicide. Drayton Witt was charged with murder.

At trial, the case for the prosecution was a medical one. There were no witnesses to any shaking. Steven's mother testified that Drayton was gentle and loving toward their son. There were no grip marks or bruises to indicate that the baby had been violently shaken. There was no bruising on the scalp to suggest that his head had been impacted. Nonetheless, the Medical Examiner and three physicians testified that the constellation of injuries meant that the infant had been violently shaken, a victim of SBS. The defence was unable to overcome the medical diagnosis and resulting legal conclusions. The accused was convicted of murder and sentenced to a minimum of 20 years in prison.

In 2012, spurred by the change in medical views, and buoyed by the 2009 writings of a former child abuse prosecutor who argued vigorously that it was time for the United States to catch up with scientific developments in Canada and the United Kingdom,²⁰³ the Arizona Justice Project petitioned for a new trial.

²⁰¹ The facts of the case have been drawn from the detailed, helpful, and ultimately successful petition in support of post-conviction relief. See Witt, "Petition", *supra* note 166 at 1–4.

²⁰² See *supra* notes 150–58 and the accompanying text.

²⁰³ Tuerkheimer, *supra* note 143 at 53 ff.

The evidence adduced in support was impressive. Dr. A.N. Guthkelch, who 40 years earlier had written the seminal paper on SBS,²⁰⁴ deposed that the science concerning SBS was now “open to serious doubt” and that the accused in this case had been convicted on insufficient grounds.²⁰⁵ A Stanford professor and Chief of Pediatric Neuroradiology, and former expert for the prosecution in SBS cases, said categorically that Steven’s brain injury was not caused by SBS; rather, he deposed, it had been caused by another mimicking condition—venous thrombosis.²⁰⁶

Most illustrative of the change in medical views was the declaration of Dr. Mosley, the original Medical Examiner. He deposed that there was no longer a consensus in the medical community that the findings he made amounted to SBS or child abuse. Significantly, he said this:

Based on my review . . . as well as the significant developments in the medical and scientific community’s understanding of SBS and several of the conditions that mimic its symptoms, I have determined that I cannot stand by my previous conclusion and trial testimony that Steven Witt’s death was a homicide. . . . *If I were to testify today, I would state that I believe that Steven’s death was likely the result of a natural disease process, not SBS.*²⁰⁷

Other medical evidence adduced in the case supported these conclusions. Counsel for Witt sought a new trial based on newly-discovered evidence that would have changed the original verdict.²⁰⁸ A significant shift in medical opinion, it was argued, satisfied this requirement.²⁰⁹ Based on the

²⁰⁴ See Guthkelch, “Infantile Haematoma”, *supra* note 144.

²⁰⁵ Witt, “Guthkelch Declaration”, *supra* note 170 at paras 5, 14–15.

²⁰⁶ “Declaration of Patrick Barnes, MD” undated, *Arizona v Witt*, No CR2000-017311 (Ariz Sup Ct 2012) at para 19, online: Lewis Roca Rothgerber LLP <<http://www.lrrlaw.com>>.

²⁰⁷ “Declaration of AL Mosley, MD” 3 February 2012, *Arizona v Witt*, No CR2000-017311 (Ariz Sup Ct 2012) at para 10, online: Lewis Roca Rothgerber LLP <<http://www.lrrlaw.com>> [emphasis added].

²⁰⁸ The Memorandum in Support sought “an evidentiary hearing to determine the issues of material fact presented below, vacate his conviction and sentence, and order a new trial”: Witt, “Petition”, *supra* note 166 at opening paragraph.

²⁰⁹ *Arizona Rules of Criminal Procedure* provide relief when an applicant shows that “[n]ewly discovered material facts probably exist and such facts probably would have changed the verdict or sentence”: 16A ARS Rules Crim Proc, r 32.1(e). A significant

overwhelming evidence, the Court actually went further than what had been requested. The Superior Court of Arizona found that while “the state has done nothing wrong,” the case was dismissed “with prejudice for reasons as stated by the defense.”²¹⁰ That brought the case to a conclusion; no new trial was ordered, and the prosecutor could not re-file charges.²¹¹

3. THE CURRENT MEDICAL VIEW OF SHAKEN BABY SYNDROME

The validity of SBS continues to be the subject of considerable debate. At the heart of the controversy is the meaning and weight that should be given to the triad. In 2011, the Ontario Court of Appeal said in *R v Kumar* that “[t]he current view of forensic pathologists, although not necessarily clinicians, is that the triad is at worst suspicious, but can no longer be considered absolute proof of traumatic head injury in the absence of other evidence.”²¹²

During this appeal, counsel for Mr. Kumar retained three experts. One was Dr. Jan Leetsma, a prominent neuropathologist from Chicago. His view went even further, based on his own research. He said that on the basis of today’s science, “Shaken Baby Syndrome must remain an unproven hypothesis with no scientific, medical or legal significance.”²¹³ The Court of Appeal found it unnecessary to resolve the issues surrounding SBS. Rather, the critical point for the Court was the clear change in medical view during the intervening period:

shift in medical opinion was said to meet this standard in *Ex Parte Henderson*, 246 SW (3d) 690, 2007 Tex Crim App LEXIS 769 (2007); *Henderson*, *supra* note 197; *Edmunds*, *supra* note 196.

²¹⁰ *Arizona v Witt* (29 October 2012), No CR2000-017311 (Ariz Sup Ct), online: Clerk of Superior Court’s Office, Maricopa County, Arizona, <<http://www.courtminutes.maricopa.gov>>. As I complete this essay, the Court has not yet issued reasons for judgment.

²¹¹ A dismissal “with prejudice” in the United States generally bars the government from prosecuting the accused on the same charge at a later date, on the basis of the Fifth Amendment’s guarantee against double jeopardy. See generally *Washington v George*, 158 P (3d) 1169 at para 30 ff, 160 Wn (2d) 727 (Sup Ct 2007).

²¹² *Kumar*, *supra* note 194 at para 19.

²¹³ *Ibid* at para 28.

It is important to place the expert evidence in its proper context. This appeal differs from some of the other cases recently heard by this court where an opinion by Dr. Charles Smith was at the heart of the case. The opinion given by Dr. Smith in 1992 was one that would have been supported by many other experts and, in fact, was apparently supported by a pathologist consulted by the defence at the time. Medical science has now advanced to a point where the existence of the triad of symptoms alone, while suspicious, is not diagnostic of non-accidental head injury. When the appellant was charged and pleaded guilty there was nothing but the triad to support the prosecution case of intentional infliction of injury.²¹⁴

The main point is this: medicine is not static or frozen in time. Medical science has evolved over the years, and will continue to evolve as research advances and new technology is developed. The Chief Forensic Pathologist for Ontario, Dr. Michael Pollanen, underscored this when he cautioned that the science of pediatric head injury is still evolving, and that even his current views are based on past and current literature and may have to be assessed differently in the future.²¹⁵

In 2008, following the release of the Goudge Inquiry Report, the Attorney General of Ontario assembled a committee of medical and legal experts to conduct a review of pediatric head injury cases that had resulted in criminal convictions, particularly SBS or “short fall” cases. The Committee’s report was released in 2011.²¹⁶ It put an even finer point on the issue, suggesting that some criminal cases *may never truly be “over”*:

The cases were assessed based on current medical knowledge and understanding of pediatric head injury. However, as science continues to evolve, some of the outstanding issues in relation to pediatric head injury may be resolved. If and when that occurs, these cases could be assessed differently in light of new scientific discoveries.²¹⁷

Finally, lest it be thought that the SBS theory has faded from prominence, it should be noted that an organization known as the “National Center on Shaken Baby Syndrome” is alive and well. It was

²¹⁴ *Ibid* at para 35.

²¹⁵ *Ibid* at para 22.

²¹⁶ 2011 Report to the Attorney General, *supra* note 141.

²¹⁷ *Ibid* at 32.

established in 1990, and is based in Utah.²¹⁸ The Center is said to be responsible for participating in, or hosting, the world's largest and most comprehensive conference on Shaken Baby Syndrome.²¹⁹ This conference has been held annually since 1996 in such diverse locations as the United States, Canada, Australia, Scotland, and Japan. The most recent was held in Paris, France in May 2014, and the next is planned for Denver, Colorado in 2014.²²⁰ Spanning three days, the 2012 conference attracted 728 attendees and presenters from around the world, and concentrated on four areas of expertise, including the latest medical information and research on the subject.

As noted at the beginning of this part, many forensic sciences are inexact in the sense that they are interpretative in nature and are subject to refinements, new technology, and new theories. They exist in a dynamic environment. The intersection of law with medicine and science therefore raises an important question: can the law respond to changes in science or medicine that undermine the integrity of a verdict of guilt that has been in place for years, if not decades? If so, on what principled basis? I will now turn to that issue.

IV. PATHWAYS TO POST-CONVICTION RELIEF

Canadian and American courts have approached the issue of post-conviction relief in different ways. Appellate courts in the United States have been wary of granting relief on the basis of a "freestanding innocence claim", i.e., an assertion detached from the Due Process Clause, which contends that new evidence of factual innocence warrants relief, despite the fact that the conviction came as a result of a constitutionally secure trial.²²¹

The underlying tone to the debate may have been set by some members of the US Supreme Court in a controversial decision delivered in 1985. In the context of the availability of an appeal, and the importance of finality,

²¹⁸ See National Center on Shaken Baby Syndrome, online: <<http://www.dontshake.org>>.

²¹⁹ *Ibid.*

²²⁰ *Ibid.*

²²¹ Robert J Smith, "Recalibrating Constitutional Innocence Protection" (2012) 87 Wash L Rev 139 at 147.

Chief Justice Burger said that “[f]ew things have so plagued the administration of criminal justice, or contributed more to lowered public confidence in the courts, than the interminable appeals, the retrials, and the lack of finality.”²²² Justice Rehnquist joined with the Chief Justice in his dissent, adding: “The result [of interminable appeals] is akin to the effect created when a mirror is held facing another mirror, the image repeating itself to infinity.”²²³

Canadian courts have chosen a different path: less dogma, more pragmatism. Rather than laying down governing principles at an early stage, risking the prospect that in the fullness of time they could be seen as overly broad or unduly restrictive, appellate courts in Canada have preferred to find a pathway that will permit a reconsideration of the case when it appears that a miscarriage of justice probably occurred, then fashion a remedy that seems appropriate on the facts of that particular case.

The difference is stark and almost certainly rooted in the legal and constitutional frameworks of both countries.

A. THE UNITED STATES

On three occasions over the past two decades, most recently in 2009, the Supreme Court of the United States has been prepared to assume, *arguendo*, that there is a constitutional right to challenge a conviction based on “truly persuasive” evidence of “actual innocence.”²²⁴ But in all three cases, the Court declined to affirm that such a right existed, effectively keeping it hypothetical in nature.

In the second of these cases (*House v Bell*), already conducted DNA testing excluded the inmate as the perpetrator, and the Court observed that the evidence was sufficiently powerful that while one or even some jurors might have had a doubt about the accused’s guilt, not every juror would have done so.²²⁵ In view of this, the Court refused to release him from

²²² *Evitts v Lucey*, 469 US 387 at 405–06, 105 S Ct 830 (1985).

²²³ *Ibid* at 411.

²²⁴ *Herrera v Collins*, 506 US 390, 113 S Ct 853 (1993); *House v Bell*, 547 US 518, 126 S Ct 2064 (2006) [*House* cited to US]; *District Attorney’s Office for the Third Judicial District v Osborne*, 557 US 52, 129 S Ct 2308 (2009) [*Osborne* cited to US].

²²⁵ *House*, *supra* note 224 at 571, Roberts CJ, dissenting.

custody, leery of recognizing a right to claim innocence and preferring instead to refer the case back to the trial level for reconsideration. More comprehensive DNA testing was then pursued and, three years later, the applicant was fully exonerated.²²⁶ This state of affairs, at an earlier stage, prompted US Judge Henry J. Friendly to write an article asking whether innocence was even relevant any longer—rather than being, as he argued it should, the main preoccupation of judges hearing criminal cases.²²⁷

Likewise, the US Supreme Court has refused to order post-conviction DNA testing that could establish innocence or confirm guilt. In *District Attorney's Office v Osborne* it was argued, broadly, that the US Constitution gave every citizen charged with a criminal offence the right to prove that he or she is innocent.²²⁸ Chief Justice Roberts, writing for a 5–4 majority, said that the matter was better dealt with by state legislatures: “We are reluctant to enlist the Federal Judiciary in creating a new constitutional code of rules for handling DNA.”²²⁹ All 50 US states have now passed legislation governing post-conviction DNA testing, although some have circumscribed the right rather tightly, such as Kentucky, which has confined it to death penalty cases where there is a reasonable probability that DNA testing will exonerate the applicant or result in exculpatory evidence that would lead to a more favourable verdict or sentence.²³⁰ The decision in

²²⁶ See David G Savage, “Murder charges dropped because of DNA evidence”, *Los Angeles Times* (13 May 2009), online: <<http://articles.latimes.com>>. See also Innocence Project, Press Release, “Paul House Fully Cleared in 1986 TN Death Row Conviction; Case is ‘a profound reminder that our system of justice must give people every reasonable opportunity to prove their innocence’” (12 May 2009), online: <<http://www.innocenceproject.org>>.

²²⁷ Henry J Friendly, “Is Innocence Irrelevant? Collateral Attack on Criminal Judgments” (1970) 38 U Chicago L Rev 142.

²²⁸ *Osborne*, *supra* note 224 at 72.

²²⁹ *Ibid* at 73.

²³⁰ KRS § 422.285 (2013), as interpreted by the Supreme Court of Kentucky in *Thomas Clyde Bowling v Commonwealth of Kentucky*, 2008-SC-000901-MR (Kentucky Supreme Court and Court of Appeal Opinions), 2011 Ky LEXIS 98 (Sup Ct 2010). In that case, the court found, provocatively, that “there is no statutory right to demonstrate innocence under Kentucky law” (*ibid* at 6). For an overview of the situation in the US, see “Today, All 50 States Have DNA Access Laws” (information graphic), online: Innocence Project <http://www.innocenceproject.org/docs/DNA_innocenceproject_website.pdf>.

Osborne was supported by the National Association of State Attorneys General on the basis that it was important to protect the states from unwarranted expense.²³¹

Two years later, in 2011, the Court, in a 6–3 decision, explained the parameters of its decision in *Osborne*: “[T]he Court’s decision in *Osborne* severely limits the federal action a state prisoner may bring for DNA testing. *Osborne* rejected the extension of substantive due process to this area, and left slim room for the prisoner to show that the governing state law denies him procedural due process.”²³²

In 2013, the Court may have retreated from this position, at least a bit. In a deeply divided court, Ginsburg J, for the majority (5–4), held that actual innocence, if proved, serves as a gateway through which a petitioning inmate may pass—even in the face of procedural bars or a statute of limitation.²³³

There are, however, three important qualifications in this ruling. First, the threshold test is high: the petitioner must demonstrate that “in light of the new evidence, no juror, acting reasonably, would have voted to find him guilty beyond a reasonable doubt.”²³⁴ Put another way, the gateway should only open if the petitioner presents evidence of innocence so strong that a court cannot have confidence in the outcome of the trial, and the court is also satisfied that the trial was free of non-harmless constitutional error. This burden of proof, the Court added, is “demanding” and will seldom be met.

Second, where the petitioner seeks to avoid the rigours of a limitation period, a court considering an actual innocence claim “should count unjustifiable delay on [the] petitioner’s part, not as an absolute barrier to

²³¹ Nina Totenberg, “High Court Says Convicts Lack Right to DNA Testing”, *NPR News* (19 June 2009), online: <<http://www.npr.org>>.

²³² *Skinner v Switzer*, 131 S Ct 1289 at 1293, 179 L Ed (2d) 233 (2011) [slip op at 2] [citations omitted].

²³³ *McQuiggin v Perkins*, 133 S Ct 1924, 185 L Ed (2) 1019 (2013) [*McQuiggin* cited to S Ct].

²³⁴ *Ibid* at 1928, citing *Schlup v Delo*, 513 US 298 at 329, 115 S Ct 851 (1994).

relief, but as a factor in determining whether actual innocence has been reliably shown.”²³⁵

Finally, consistent with the Court’s previous decisions, the majority observed that it had still “not resolved whether a prisoner may be entitled to habeas relief based on a free-standing claim of actual innocence.”²³⁶ This continues to leave unclear whether a petitioning inmate in the United States can obtain relief when actual innocence is proven, but the record shows that the trial was constitutionally secure.

In a stinging dissent, Scalia J criticized the majority for “ambush[ing] Congress with an utterly unprecedented (and thus unforeseeable) maneuver”,²³⁷ namely, overriding a statutory bar to relief. Scalia J explained it in the following terms: “Judicially amending a validly enacted statute in this way is a flagrant breach of the separation of powers.”²³⁸ Arguing that the majority ignored “basic legal principles where they pose an obstacle to its policy-driven, free-form improvisation”,²³⁹ Scalia J warned of a flood of meritless claims, contending that “[t]oday’s decision piles yet more dead weight onto a postconviction habeas system already creaking at its rusted joints.”²⁴⁰

Left unaddressed by the minority was the ancient and well-established principle adorning the entrance to the Faculty of Law at the University of British Columbia, engraved on the wall behind the bench in the Supreme Court of Georgia, and carved over the lintel of the Bridewell Garda station in Dublin: *fiat justitia ruat coelum* (let justice be done, though the heavens fall).²⁴¹

In summary, a criminal defendant proven guilty after a *fair* trial in the United States does not have the same liberty interests as a free person. The

²³⁵ *McQuiggin, ibid* at 1927.

²³⁶ *Ibid* at 1931.

²³⁷ *Ibid* at 1942.

²³⁸ *Ibid* at 1939.

²³⁹ *Ibid* at 1940.

²⁴⁰ *Ibid* at 1943.

²⁴¹ A maxim believed to have originated in Roman times, but most clearly emerging in English jurisprudence near the end of the 16th century. See *R v Wilkes* (1770), 4 Burr 2527, 98 ER 327 at 347; *Somerset v Stewart* (1772) Lofft 1, 98 ER 499 at 509.

post-conviction right to due process is certainly not the same as the right at trial, and any asserted due process right must be analyzed in light of the fact that after being found guilty after a fair trial, a defendant has a circumscribed interest in post-conviction relief. After conviction, considerations other than the interests of the convicted person come into play, especially the importance of finality in criminal judgments. The Supreme Court of the United States has consistently declined to recognize a federal constitutional right to be released upon proof of “actual innocence”; the cases raising the issue thus far have not demonstrated any due process problems, obviating the need to make a ruling one way or the other. This intense focus on issues of due process has translated into, amongst other things, a refusal to allow a defendant access to state evidence for new DNA testing that may establish innocence, on the basis that: a) it is unwise to expand the concept of substantive due process; b) the courts should not become policymakers; and c) the challenges posed by DNA to the criminal justice system are best addressed by the legislature.²⁴²

B. CANADA

In Canada, there are several viable routes to relief. Some are long-established; others are innovative remedies designed to ensure that principles of finality and due process do not trump the prospect that an innocent person could languish in jail. The following is a brief checklist of legal routes taken in the past that seem to be available in the future.

1. WHERE NO APPEAL WAS ORIGINALLY BROUGHT AGAINST CONVICTION

The easiest scenario is where charges resulted in a conviction, but no appeal was taken at the time or an appeal was taken but abandoned and not dismissed on its merits.²⁴³ Applications for leave to extend the time within which an appeal can be brought before the Court of Appeal can be made even decades later—although it is certainly helpful to have developed

²⁴² *Osborne, supra* note 224, Roberts CJ, for the majority.

²⁴³ *Simmons, supra* note 194 at para 15.

the defence case to the point where the Crown is prepared to consent to the extension.²⁴⁴

2. WHERE THE ACCUSED PLEADED GUILTY AT TRIAL

Even where the accused entered a plea of guilty at trial, Courts of Appeal retain a discretion, to be exercised in the interests of justice, to receive fresh evidence explaining the circumstances leading to the plea, and may set aside the guilty plea, allow the appeal, and vacate the original conviction—despite the passage of many years.²⁴⁵

3. THE SUPREME COURT OF CANADA CAN GRANT LEAVE TO APPEAL TO THAT COURT, EVEN DECADES LATER

Even 41 years later, a defendant may seek and receive an extension of time to file an application for leave to appeal to the Supreme Court of Canada from the judgment of a provincial or territorial court of appeal, and have the case remanded back to that court of appeal for rehearing based on new evidence.²⁴⁶

²⁴⁴ *Criminal Code*, *supra* note 73, s 678(2). While the Code is silent on the criteria to be considered on a motion to extend, appellate courts have generally suggested that applicants should be able to demonstrate that they had a bona fide intention to appeal within the appeal period. See *R v Meidel*, 2000 BCCA 39, 148 CCC (3d) 437; *R v Menear* (2002) 162 CCC (3d) 233, 155 OAC 13 (CA); *R v Hayes*, 2007 ONCA 816, 226 CCC (3d) 417. In the types of situations discussed in this paper, that will not generally have been the case; in the absence of Crown consent, therefore, the argument will have to be advanced in terms of an overriding need to avoid a miscarriage of justice. See *R v Truong*, 2007 ABCA 127 at para 6, 404 AR 277 [*Truong*]; *R v Arganda*, 2011 MBCA 24 at paras 6–7, 262 Man R (2d) 244 [*Arganda*]; *R v Otte*, 2012 MBCA 88, 284 Man R (2d) 33 [*Otte*].

²⁴⁵ *CM*, *supra* note 181; *CF*, *supra* note 194; *R v Brant*, 2011 ONCA 362, 2011 CarswellOnt 3005 (WL Can) [*Brant*]; *Kumar*, *supra* note 194; *Hanemaayer*, *supra* note 194; *Sherret-Robinson*, *supra* note 181; *R v Lewis*, 2012 SKCA 81, 95 CR (6th) 317 [*Lewis*].

²⁴⁶ In *R v Salmon* (1972), 10 CCC (2d) 184, 1972 CarswellOnt 1097 (WL Can) (CA), the accused was convicted of manslaughter in the death of his 28-year-old common law partner. The theory of the Crown was that the accused had inflicted heavy and ultimately fatal blows on the deceased; the defence contended that the fatal injuries resulted from a number of falls by the deceased. An appeal against conviction was mounted primarily on the prejudicial effect of pictures taken of the deceased's body, and

The originating role of the Supreme Court of Canada in cases where it is said that a miscarriage of justice occurred is well illustrated in *R v Marquardt*. There, the applicant in 2009 sought leave to appeal a judgment of the Court of Appeal for Ontario that had been delivered 11 years earlier. Granting the leave sought, the Supreme Court of Canada said that “the case is remanded to the Court of Appeal for Ontario for consideration of fresh evidence and whether the applicant’s conviction constitutes a miscarriage of justice.”²⁴⁷ In turn, the Court of Appeal allowed the fresh evidence, concluded that the applicant’s conviction constituted a miscarriage of justice, allowed the appeal, and ordered a new trial. In doing so, the Court said this: “[I]t is tragic that it has taken so long to uncover the flawed pathological evidence that so clearly contributed to the appellant’s conviction in 1995.”²⁴⁸

Crown consent to leave following a thorough review by independent counsel will expedite the process and maximize the prospects of success on a motion to the Supreme Court of Canada. British Columbia clearly leads the provinces in the appointment of independent “Special Prosecutors” in contentious cases. In *R v Dhillon*, the Province appointed Peter Wilson, QC in 2011 to review the conviction of the defendant in respect of his conviction for sexual assault six years earlier. Mr. Wilson concluded that a miscarriage had occurred because of material non-disclosure of critical evidence, and on 20 February 2013, the Ministry of Justice for British Columbia announced that it would support Mr. Dhillon in any application

a ruling by the trial judge, which allowed a young boy to testify. Forty-one years later, three pathologists concluded that the death resulted from a stroke after a night of heavy drinking, not from a blow to the head during brutal beatings. The Supreme Court of Canada remanded the case to the Court of Appeal for Ontario for hearing, without reasons. See *John Frederick Salmon v Her Majesty the Queen*, 2012 CanLII 64753, 2012 CarswellOnt 13297 (WL Can) (SCC). At the time of writing, the case is pending before the Ontario Court of Appeal.

²⁴⁷ *Tammy Marie Marquardt v Her Majesty the Queen*, 2009 CanLII 21729, 2009 CarswellOnt 2351 (WL Can) (SCC) [*Marquardt* 2009].

²⁴⁸ *Marquardt* 2011, *supra* note 194 at para 24.

he wished to make to the Supreme Court of Canada for leave to appeal and to set aside his 2005 conviction.²⁴⁹

4. MINISTERIAL POWERS UNDER SECTION 696.1 OF THE *CRIMINAL CODE*

Section 696.1 of the *Criminal Code* provides an avenue for review to anyone convicted under a federal enactment whose right to an appeal has been exhausted.²⁵⁰ This remedy is well established, having been in place since Canada's first *Criminal Code* passed in 1892.²⁵¹ Under section 696.3(3), the federal Minister of Justice can direct a new trial "if the Minister is satisfied that there is a reasonable basis to conclude that a miscarriage of justice likely occurred".²⁵² While this has been and continues to be a controversial pathway for relief—mostly because the gatekeeper function lies in the hands of the Executive²⁵³—it has been the route of choice in a number of well-known cases in which a miscarriage of justice has been exposed.²⁵⁴

²⁴⁹ See Ministry of Justice for BC, Media Statement, 13-03, "Special Prosecutor Concludes Miscarriage of Justice Has Occurred" (20 February 2013), online: <<http://www.ag.gov.bc.ca>>. In its formal announcement (*ibid*), British Columbia said this:

The Special Prosecutor has recommended to the Criminal Justice Branch that Mr. Dhillon be provided with full disclosure of the materials reviewed by the Special Prosecutor and an opportunity to apply to have his conviction set aside, either by way of an application to the Supreme Court of Canada for leave to appeal, or by an application for ministerial review under Part XXI.1 of the Criminal Code. The Special Prosecutor recommends that it be left to the discretion of Mr. Dhillon and his legal counsel to determine which course of action to pursue.

²⁵⁰ *Criminal Code*, *supra* note 73, s 696.1.

²⁵¹ *The Criminal Code, 1892*, SC 1892 (55-56 Vict), c 29, s 748.

²⁵² *Criminal Code*, *supra* note 73, s 696.3(3).

²⁵³ The controversy is well examined in a series of essays published in the *Criminal Law Quarterly* in 2012. These are conveniently summarized by Kent Roach, Professor of Law and Prichard-Wilson Chair in Law and Public Policy at the University of Toronto, and Managing Editor of the *Criminal Law Quarterly* in "Editorial: Criminal Case Review Commissions and Ministerial Post-Conviction Review" (2012) 58:2 *Crim LQ* 135.

²⁵⁴ Including, for example, David Milgaard, Steven Truscott, Romeo Phillion, James Driskell, and Kyle Unger (amongst many others).

5. REFERENCES BY THE GOVERNMENT OF CANADA PURSUANT TO SECTION 53 OF THE *SUPREME COURT ACT* AND SUBPARAGRAPH 696.3(3)(A)(II) OF THE *CRIMINAL CODE*

Provinces have constitutional responsibility for the administration of justice in their respective provinces.²⁵⁵ Additionally, in the vast majority of cases where it has been contended that a miscarriage of justice has occurred, provincial prosecution services originally had conduct of the case at trial and on appeal. Despite these realities, the Governor in Council has on three occasions directed a Reference to the Supreme Court of Canada pursuant to section 53 of the *Supreme Court Act*, where there was reason to believe that a wrongful conviction may have occurred. These cases captured the attention of the public at the time; and it is probably fair to say that in each instance the Reference was made not for constitutional reasons but to ensure that the public had confidence that the Canadian criminal justice system could accurately sort out who is guilty, and who is not. Additionally, the Minister of Justice for Canada has power under section 696.3 of the *Criminal Code* to refer a case to the court of appeal for its advice on an issue, or for a determination on its merits as if it were an appeal by the convicted person.²⁵⁶

6. INQUIRIES BY PROVINCIAL GOVERNMENTS PURSUANT TO PROVINCIAL LEGISLATION

In no less than seven separate cases provincial governments have ordered judicial commissions of inquiry to determine why a miscarriage of justice occurred.²⁵⁷ Government's message to the public has been clear:

²⁵⁵ *Constitution Act 1867* (UK), 30 & 31 Vict, c 3, s 92(14) reprinted in RSC 1985, App II, No 5.

²⁵⁶ *Criminal Code*, *supra* note 73, s 696.3. See e.g. *R v Coffin*, [1956] SCR 191, 114 CCC 1; *Reference Re: Steven Murray Truscott*, [1967] SCR 309, 62 DLR (2d) 545; *Reference Re: Milgaard (Can)*, [1992] 1 SCR 866, 90 DLR (4th) 1. The Minister can also refer to provincial courts of appeal. See e.g. *Truscott (Re)*, 2007 ONCA 575, 225 CCC (3d) 321 [*Truscott*]; *R v DRS*, 2013 ABCA 18, 542 AR 92; *Walsh (Re)*, 2008 NBCA 33, 238 CCC (3d) 289 [*Walsh*].

²⁵⁷ Donald Marshall, Jr. (Nova Scotia, 1989); Guy Paul Morin (Ontario, 1998); Thomas Sophonow (Manitoba, 2001); Ronald Dalton, Gregory Parsons, and Randy Druken

more judicially led inquiries have been called on the issue of wrongful conviction than any other single issue facing Canadians since Confederation. Some inquiries focused on error correction or on the conduct of the justice system participants involved; most, however, were broadly based, and sought advice on the systemic forces at play, to avoid miscarriages of justice in the future.

7. JUDICIAL WILLINGNESS TO OVERLOOK PROCEDURAL
IMPEDIMENTS AND PROVIDE RELIEF WHERE THE FACTS
DEMAND IT

The high-water mark in the granting of a judicial pathway to remedy an apparent miscarriage of justice may well be the case of Ivan William Mervin Henry, decided by the BC Court of Appeal in 2010.²⁵⁸ In 1983, Henry was charged with and convicted of 10 counts of sexual assault involving eight complainants. The Crown's case was razor-thin, perhaps non-existent. Henry had insisted on representing himself. After conviction, he was declared a dangerous offender and sentenced to an indefinite period of imprisonment.

For the next three decades, Henry asserted his innocence in a battery of applications before the trial court, Court of Appeal, and the Supreme Court of Canada. He was unsuccessful in all of them.²⁵⁹ But the evidentiary sands started to shift in 2002. Police re-investigated his case. Prosecutors started to believe that he may have been innocent. British Columbia appointed an independent counsel to investigate the matter; he recommended that the Crown not oppose a motion to reopen the case—even though the verdict had literally been etched in stone for 25 years.²⁶⁰

(Newfoundland and Labrador, 2006); James Driskell (Manitoba, 2007); David Milgaard (Saskatchewan, 2008); and the Inquiry into Pediatric Forensic Pathology (Goudge Inquiry) (Ontario, 2008).

²⁵⁸ *R v Henry*, 2010 BCCA 462, 262 CCC (3d) 307 [*Henry*].

²⁵⁹ *Ibid* at paras 20–23.

²⁶⁰ This recommendation actually swam upstream for at least two reasons: the principle of finality (see the cases in *infra* note 267); and the general rule that consent of the parties does not confer jurisdiction where the court otherwise has no power to deal with the issue. See *Giroux v The King* (1917), 56 SCR 63, 39 DLR 190; *The Dominion Cannery Ltd v Costanza* (1922), [1923] SCR 46 at 66–67, 1922 CarswellOnt 127 (WL Can);

In 2010, the British Columbia Court of Appeal ruled that, despite an intensive judicial examination of the case during the preceding three decades, including two unsuccessful appeals to the Court of Appeal itself,²⁶¹ the interests of justice required “that the order dismissing [this] appeal in 1984 be set aside and [this] appeal [be] re-opened for consideration on its merits.”²⁶²

Because a miscarriage of justice appeared to have occurred, the Court was prepared to overlook what might otherwise have been significant procedural impediments, including the principle of finality,²⁶³ and provide a route back into the court system in circumstances that it described as “exceptional.”²⁶⁴

Put simply, process was not allowed to outweigh considerations of fairness. After a full hearing before the Court of Appeal, the appeal launched in 1984 was reopened 26 years later, the convictions were quashed, and acquittals were entered on all counts.²⁶⁵

Sayers v The King, [1941] SCR 362, 3 DLR 483; *R v Dudley*, 2009 SCC 58, [2009] 3 SCR 570.

²⁶¹ The first, in 1984, was dismissed for want of prosecution; the second, in 1997, was dismissed on the basis that the notice of appeal raised issues of fact, not law. See *Henry*, *supra* note 258 at paras 20, 23. See also *R v Henry* (1997), 163 WAC 183, 100 BCAC 183.

²⁶² *Henry*, *supra* note 258 at para 32, citing *R v Henry*, 2009 BCCA 12 at para 20, 445 WAC 244.

²⁶³ *R v Wigman*, [1987] 1 SCR 246 at 257, 38 DLR (4th) 530 (“[f]inality in criminal proceedings is of the utmost importance”); *R v Mahalingan*, 2008 SCC 63 at paras 30, 38, 46–47, 75, [2008] 3 SCR 316; *R v Brown* (1993), 2 SCR 918 at 203–05, 105 DLR (4th) 199 [Brown]; *R v Rollocks* (1994), 19 OR (3d) 448 at 453–54, 91 CCC (3d) 193 (CA) [Rollocks]; *R v EGM*, 2004 MBCA 43, [2006] 2 WWR 433; *R v Hay*, 2013 SCC 61 at para 64, [2013] 3 SCR 694 [Hay 2013]. For a recent commentary on the principle of finality within an administrative law context, see *Penner v Niagara (Regional Police Services Board)*, 2013 SCC 19 at paras 73–107, [2013] 2 SCR 125, LeBel and Abella JJ, dissenting (Rothstein J, concurring in dissent).

²⁶⁴ *Henry*, *supra* note 258 at paras 23, 32.

²⁶⁵ *Ibid* at para 155. It should be noted that this is not a case where forensic science changed; rather, the case is cited to provide an illustration of how the courts can find a route to provide a remedy where the facts call out for one. It should also be noted that this case resulted in an acquittal—not just a new trial, as often occurs despite vigorous

8. EVIDENTIARY CONSIDERATIONS: SHAPING LAW IN LIGHT OF CANADA'S EXPERIENCE WITH WRONGFUL CONVICTIONS

During the past two decades, the Supreme Court of Canada has delivered a lengthy and powerful line of decisions that signal the need to interpret Canadian law—and if necessary reshape it—in light of the reality that a number of wrongful convictions have occurred in this country.²⁶⁶ Two examples of this philosophy illustrate how Canadian courts are prepared to set notions of finality and process aside in favour of ensuring that a miscarriage of justice is not perpetuated.

The first concerns motions to tender fresh evidence on appeal. The criteria for admission are well known:

- (1) the evidence should generally not be admitted if, by due diligence, it could have been adduced at trial;
- (2) the evidence must be relevant in the sense that it bears upon a decisive or potentially decisive issue in the trial;
- (3) the evidence must be credible in the sense that it is reasonably capable of belief; and
- (4) it must be such that if believed it could reasonably, when taken with the other evidence adduced at trial, be expected to have affected the result.²⁶⁷

There is, however, a long and growing line of appellate authority that provides an important caveat in relation to the “due diligence” criterion: it

arguments that the facts of the case justify an outright termination of the case through an acquittal. Concerning the latter, see *CF*, *supra* note 194; *CM*, *supra* note 181; *Marquardt* 2011, *supra* note 194; *Marquardt* 2009, *supra* note 247. See especially *R v Phillion*, 2010 ONSC 1604, 256 CCC (3d) 63 [*Phillion*].

²⁶⁶ See e.g. *Starr*, *supra* note 68; *United States v Burns*, 2001 SCC 7 at paras 1–3, [2001] 1 SCR 283; *R v McClure*, 2001 SCC 14 at para 40, [2001] 1 SCR 445; *R v Mapara*, 2005 SCC 23 at para 54, [2005] 1 SCR 358; *Hill v Hamilton-Wentworth Regional Police Services Board*, 2007 SCC 41 at paras 36, 43, [2007] 3 SCR 129; *R v Trochym*, 2007 SCC 6 at para 1, [2007] 1 SCR 239; *R v Khela*, 2009 SCC 4 at paras 2, 12, [2009] 1 SCR 104; *R v Sinclair*, 2010 SCC 35 at para 90, [2010] 2 SCR 310, Binnie J, in dissent; *R v DAI*, 2012 SCC 5 at paras 1, 65, 91, [2012] 1 SCR 149.

²⁶⁷ *R v JAA*, 2011 SCC 17 at para 7, [2011] 1 SCR 628, citing the criteria established in *Palmer v The Queen* (1979), [1980] 1 SCR 759 at 775, 106 DLR (3d) 212.

will not be applied as strictly in criminal cases, *and it must yield if its application would result in a miscarriage of justice.*²⁶⁸

Second, recall that the US Supreme Court has declined to allow a defendant access to State evidence for new DNA testing that may establish innocence, preferring instead to look to 50 different legislatures to sort such issues out.²⁶⁹ The Supreme Court of Canada, on the other hand, has held that it has jurisdiction to release a trial exhibit for testing even though the case is simply pending on an application for leave to appeal, and no right to appeal yet exists.²⁷⁰

V. CONCLUDING OBSERVATIONS

For decades, the forensic sciences have produced valuable evidence that has contributed to the successful prosecution of those who have committed offences, as well as the exoneration of those who were innocent. In the last two decades, advances in some of these forensic sciences, especially DNA technology, have shown that there is even greater potential now to help law enforcement identify criminals, and clear others.²⁷¹ Perhaps most famously, DNA testing demonstrated beyond any doubt that David Milgaard was innocent of the murder of nurse Gail Miller in Saskatoon, allowing him to be released from jail after having served over two decades in a penitentiary; at the same time, separate DNA tests showed that another person, Larry Fisher, was responsible for the crime. Fisher has since been convicted of first degree murder and sentenced to life imprisonment.²⁷²

These advances, however, have also shown that in some cases forensic sciences previously relied upon may have contributed to wrongful convictions. The National Academy of Sciences in the United States

²⁶⁸ *Ibid*; *R v GDB*, 2000 SCC 22 at para 37, [2000] 1 SCR 520; *R v Warsing*, [1998] 3 SCR 579, [1999] 6 WWR 372; *R v Appelton* (2001), 55 OR (3d) 321, 156 CCC (3d) 321 (CA); *Mullins-Johnson*, *supra* note 151; *Marquardt* 2011, *supra* note 194; *R v GM*, 2012 NLCA 47, 325 Nfld & PEIR 1; *Hay* 2013, *supra* note 263.

²⁶⁹ See Part IV.A, above.

²⁷⁰ *R v Hay*, 2010 SCC 54, [2010] 3 SCR 206.

²⁷¹ NAS, *supra* note 17 at 4; *Osborne*, *supra* note 224 at 62–65, Roberts CJ.

²⁷² *R v Fisher*, 2003 SKCA 90, 179 CCC (3d) 138, leave to appeal to SCC refused, [2004] 3 SCR viii (note), 332 NR 394 (note).

recently agreed, concluding that there is simply not enough science underlying almost all of the forensic sciences.²⁷³ The 2013 *Forensic Science in Canada* report issued by scientists in this country also agreed, observing that public and judicial confidence in the forensic sciences has been eroded by the damage wrought by faulty forensic evidence, and must be rebuilt.²⁷⁴ This is especially the case in the so-called “interpretative” forensic sciences—those that rely primarily on the judgment of an individual rather than those having a scientific underpinning.²⁷⁵ And the warning flags should certainly be raised where it becomes evident that an expert witness is relying primarily on his or her *experience in the field*, rather than on an appropriate scientific underpinning in that specific case.

For instance, hair microscopy, an important investigative tool during the latter part of the 20th century, has now largely been discredited and, in my view, involved little more than an educated guess by police-aligned examiners. Fingerprint comparison evidence, the “gold standard” during most of the 20th century, is presently under a critical global microscope as a result of serious errors by some of the leading fingerprint examiners in the world. Forensic pathologists who were quite clear in their testimony during the 1990s are now conceding that some of the medical theories that underlay their evidence have shifted significantly since then.

The cold reality is that innocent persons have been sent to jail because of flawed forensic science, and because of the “omniscient glow” that often prompts juries to give expert opinion evidence more weight than it deserves.²⁷⁶

The principal point is this: we now know that, after legal proceedings are complete, the factual matrix can shift, leaving the result of a trial substantially in doubt. The reasons for this are many and varied, but in my view three factors are critical. They are not watertight categories, and in some respects they are inextricably linked.

²⁷³ NAS, *supra* note 17 at 7. See also the discussion of this issue by Sangha, Roach & Moles, *supra* note 1 at 241.

²⁷⁴ Chayko & Gulliver, *supra* note 84 at 3.

²⁷⁵ NAS, *supra* note 17 at 8.

²⁷⁶ To use the phrase adopted by Charron JA on behalf of the Court in *R v Ranger* (2003), 67 OR (3d) 1 at para 64, 178 CCC (3d) 375 (CA).

First, many aspects of the forensic sciences are, and for decades have been, in a state of evolution due to new discoveries, technological advances, and continuing research.²⁷⁷ It follows, therefore, that what is presented to a court may be nothing more than a “snapshot” of the forensic view *at that point in its evolutionary continuum*. That may or may not remain the prevailing view in any particular discipline, but where there is a shift in thinking, conviction may become unsafe if the impugned evidence played an important role at trial.

The criminal justice system places a high premium on the finality of proceedings.²⁷⁸ The rationale underlying this principle was best described in 1993 by L’Heureux-Dubé J in a dissenting judgment (but not on this point) concerning the raising of new arguments on appeal,²⁷⁹ and was subsequently adopted by Doherty JA on behalf of a unanimous Ontario Court of Appeal in 1994²⁸⁰ and by that same Court, differently constituted, in 2007:

[T]he general prohibition against new arguments on appeal supports the overarching societal interest in the finality of litigation in criminal matters. Were there to be no limits on the issues that may be raised on appeal, such finality would become an illusion. Both the Crown and the defence would face uncertainty, as counsel for both sides, having discovered that the strategy adopted at trial did not result in the desired or expected verdict, devised new approaches. Costs would escalate and the resolution of criminal matters would be spread out over years in the most routine cases. Moreover society’s expectation that criminal matters will be disposed of fairly and fully at the first instance and its respect for the administration of justice would be undermined. Juries would rightfully be uncertain if they were fulfilling an important societal function or merely wasting their time.

²⁷⁷ See the 2011 Report to the Attorney General, *supra* note 141 at 1. See also Pollanen et al, *supra* note 20 at 9.

²⁷⁸ Consider the line of cases on finality in *supra* note 263 and the accompanying text.

²⁷⁹ *Brown*, *supra* note 263 at 203–05.

²⁸⁰ *Rollocks*, *supra* note 263 at 452–54.

For these reasons, courts have always adhered closely to the rule that such tactics will not be permitted.²⁸¹

In traditional terms, the accused is either guilty or is acquitted at the end of the trial and any subsequent appellate proceedings. The choice is stark and enduring. But how does one reconcile the principle of finality with the reality, as we now understand it, that pivotal forensic principles and resulting conclusions may evolve and change in the years subsequent to the legal proceedings?

Second, the experience in Canada and the United Kingdom during the past few decades raises significant issues about whether there is a disconnect between the demands of the criminal justice system, and the reality of what the forensic sciences can actually offer. Commissioner Goudge put it this way in the context of the level of certainty that forensic pathology can provide:

The prosecution must prove criminality beyond a reasonable doubt. Although this burden of proof has application to the entirety of the evidence, not individual pieces of it, it is clear that the criminal justice system may make demands on forensic pathology for certainty, when the science may not reasonably permit such confidence. Even when the latter is acknowledged, forensic pathologists may have difficulty quantifying their levels of confidence in ways that not only have scientific validity but are easily utilized by the legal system.²⁸²

On a broader scale, the NAS arrived at a similar conclusion: nuclear DNA is the clear gold standard in the sense that it can consistently and with a high degree of certainty demonstrate a connection between evidence and a particular source. On the other hand, other forensic science techniques carry, in varying degrees, an unsettling accuracy risk.

Third, there is a growing sense that we have become too reliant on expert evidence in criminal cases. As the Ontario Court of Appeal recently put it: “Sometimes it seems that a deluge of experts has descended on the

²⁸¹ *R v LG*, 2007 ONCA 654 at paras 43–44, 228 CCC (3d) 194. See also *R v Sipos*, 2012 ONCA 751 at para 22, 297 CCC (3d) 22, which adds to the list of concerns the potential for the Crown having to reconstitute its case years after the fact, and the trauma that victims may face having to testify once again when they believed that the case was long behind them.

²⁸² Goudge Report 2, *supra* note 134 at 74. See also Pollanen et al, *supra* note 20 at 9.

criminal courts ready to offer definitive opinions to explain almost anything,”²⁸³ further cautioning that “[e]xpert evidence has the real potential to swallow whole the fact-finding function of the court, especially in jury cases.”²⁸⁴

Expansion of this trend into areas of forensic science that are evolutionary in nature—or, worse still—where the experts themselves are actively debating underlying and foundational principles, may increase the risk of post-trial “shifting sands” to an unacceptable level. Hair microscopy and reliance on theories such as Shaken Baby Syndrome provide good examples of this risk.

The pivotal question can be expressed in this way: How do we avoid miscarriages of justice when core facts established at trial later turn out to have been a moving target?

Despite these warning flags and the attendant risks, forensic evidence will continue to be tendered and received into evidence in Canada. The challenge will be to ensure that the science relied upon, and the process that was used, are methodologically valid, reasonable, and balanced, and the evidence tendered in court is appropriately contextualized. The latter will involve, at a minimum: setting boundaries for the proposed expert evidence, with strict adherence to those boundaries;²⁸⁵ ensuring that any limitations concerning the accuracy or reliability of the evidence are clearly conveyed to the trier of fact; and avoiding being dogmatic in the presentation of the evidence, recognizing that knowledge in the area may evolve over time, requiring a revision of the conclusions reached.²⁸⁶

The US government has taken a first step to address at least some of these issues. On 15 February 2013, the Justice Department and the National Institute of Standards and Technology announced a “National

²⁸³ *Abbey*, *supra* note 128 at para 72.

²⁸⁴ *Ibid* at para 71.

²⁸⁵ As noted by the Ontario Court of Appeal in *Abbey*, “overreaching by expert witnesses is probably the most common fault leading to reversals on appeal” (*ibid* at para 62).

²⁸⁶ On this point, see Goudge Report 2, *supra* note 134 at 72, quoting the evidence presented at the Inquiry by Dr. Jack Crane, the State Pathologist for Northern Ireland. See also Justice Marc Rosenberg, writing extra-judicially, in his Forward to Pollanen et al, *supra* note 20 at 1.

Commission on Forensic Science”. Composed of 30 professionals drawn from the scientific and legal communities, the Commission is expected to have responsibility for “developing guidance concerning the intersections between forensic science and the courtroom and developing policy recommendations, including uniform codes for professional responsibility and requirements for training and certification.”²⁸⁷

Response to this announcement was swift. On 2 April 2013, the International Association for Identification issued a written statement of support for this initiative, noting that the stated objective is “to strengthen and enhance the practice of forensic science, and to develop policy recommendations for the Attorney General.”²⁸⁸ Three months later, on 17 July 2013, the Justice Department and the FBI announced a review of thousands of previous cases where it is believed that prosecution experts may have exaggerated the significance of “matches”, especially those reached in cases involving hair microscopy.²⁸⁹ The precise terms of this review are unclear, as are the timelines to review and report. On 14 January 2014, the US Justice Department and the US Department of Commerce’s National Institute of Standards and Technology announced appointments to the National Commission. The 30 Commissioners were chosen from a pool of more than 300 candidates. They include forensic science services providers, research scientists and academics, law enforcement officials, prosecutors, defence attorneys, and judges.²⁹⁰

The review movement has started to trickle down to the State level as well. On 14 January 2014, the Texas Forensic Science Commission voted

²⁸⁷ Department of Justice and National Institute of Standards and Technology (NIST), News Release, “Department of Justice and National Institute of Standards and Technology Announce Launch of National Commission on Forensic Science” (15 February 2013), online: <<http://www.nist.gov>>.

²⁸⁸ Letter from Deborah A Leben, President of the International Association for Identification (IAI), to James M Cole, Deputy Attorney General of the United States (2 April 2013), online: <<https://www.theiai.org>>.

²⁸⁹ Spencer S Hsu, “U.S. reviewing 27 death penalty convictions for FBI forensic testimony errors”, *The Washington Post* (17 July 2013), online: <<http://www.washingtonpost.com>>.

²⁹⁰ Department of Justice and National Institute of Standards and Technology, News Release, “First Members of New National Commission on Forensic Science Named” (14 January 2014), online: <<http://www.nist.gov>>.

unanimously to proceed with what was described as a “first-in-the-nation review of state criminal convictions”, including cases that involved microscopic hair analysis.²⁹¹ The Innocence Project in the United States, which had previously entered into an unprecedented partnership with the FBI and the Department of Justice to review microscopic hair analysis cases throughout the United States, embraced this development.²⁹²

A similar movement has developed in Canada, although it is scientifically rather than government-driven, and is forward-looking rather than reflective of what has occurred in the past. *Forensic Science in Canada* is a thoughtful report that builds on two changes that have already started to develop in this country: a shift to an evidence-based paradigm in forensic scientific inquiry; and a need to bridge the gap between expectations and deliverables in the provision of expert opinion evidence. Most importantly, the Report recognizes that just as the scientific community’s approach has changed, so does the science itself: new theories, methods, and techniques are being developed every day. The impact of these changes on criminal cases that are “still in the system”—in the sense that charges are pending or the defendant has been convicted and imprisoned—becomes the central dilemma.

The challenge ahead may also involve a reconsideration of the extent to which a trial judge should evaluate the reliability of the evidence as a prerequisite to admission. This is especially the case where, on a preliminary showing, it appears clear that there is a serious debate within the forensic community itself on issues of reliability and underlying principles and assumptions, or that the discipline may at that stage be in the process of evolution and reassessment.²⁹³

²⁹¹ Jordan Smith, “Hair Analysis: The Root of the Evidence Problem”, *Austin Chronicle* (13 January 2014), online: <<http://www.austinchronicle.com>>.

²⁹² Innocence Project, “Hair Analysis Underway in Texas” (14 January 2014), online: <<http://www.innocenceproject.org>>. The Innocence Project is affiliated with the Benjamin N Cardozo School of Law.

²⁹³ For a discussion of whether there is a constitutional right to have inherently unreliable evidence excluded under the *Canadian Charter of Rights and Freedoms*, Part 1 of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982, c 11 [*Charter*], where its admission produces a significant risk of a wrongful conviction, see Kent Roach, “Unreliable Evidence and Wrongful Convictions: The Case for Excluding

There are several judicial pathways to post-conviction relief in Canada where new and cogent evidence shows that a miscarriage of justice probably occurred. Unlike the United States, where appellate courts are caught up in controversy over granting relief where the conviction flowed from a constitutionally secure trial, Canada's approach has been much more pragmatic. The courts in this country are less interested in dogma and more factually focused on granting relief where the broad interests of justice clearly demand it.

Not surprisingly, no clear test for relief has emerged in Canada. An appellate court's powers in relation to an appeal from conviction are governed by paragraph 686(1)(a) of the *Criminal Code*, which include allowing an appeal where there has been an error of law or a miscarriage of justice. Courts of appeal have wide powers under subsection 686(2) to effect justice in a given case.²⁹⁴ Judgments granting some form of remedy are often framed in terms of a "discretion" retained by appellate courts that ought to be "exercised in the interests of justice."²⁹⁵ Other judgments have emphasized that the "unusual circumstances" of the case require appellate intervention,²⁹⁶ or that on the facts of the case there is an "overriding need" to avoid a miscarriage of justice.²⁹⁷

Likewise, there is no bright line that determines the nature of the relief that is appropriate. That is usually tied to the cogency of the new evidence—an acquittal where it is clear that the applicant was wrongly convicted, or it is now evident that no offence even took place;²⁹⁸ a new trial where a miscarriage of justice occurred but the issue of factual

Tainted Identification Evidence and Jailhouse and Coerced Confessions" (2007) 52 Crim LQ 210. On a similar issue, see Edmond, *supra* note 9.

²⁹⁴ See *Lewis*, *supra* note 245.

²⁹⁵ *CM*, *supra* note 181; *Brant*, *supra* note 245; *Kumar*, *supra* note 194; *Hanemaayer*, *supra* note 194; *Henry*, *supra* note 258; *Lewis*, *supra* note 245; *Simmons*, *supra* note 194.

²⁹⁶ See e.g. *Truscott*, *supra* note 256; *Henry*, *supra* note 258;

²⁹⁷ *Truong*, *supra* note 244 at para 6; *Arganda*, *supra* note 244 at paras 6–7; *Otte*, *supra* note 244.

²⁹⁸ See *Mullins-Johnson*, *supra* note 151; *Hanemaayer*, *supra* note 194; *Walsh*, *supra* note 256; *Sherret-Robinson*, *supra* note 181; *Henry*, *supra* note 258; *Brant*, *supra* note 245; *Kumar*, *supra* note 194.

innocence is less clear.²⁹⁹ Even in the latter scenario, there is considerable discretion: where an appellate court would normally order a new trial, it may still acquit where on the facts it would be unfair to place the accused on trial again, or where it is clearly more probable than not that the appellant would be acquitted at a new trial.³⁰⁰

It is important to remember, however, that in post-conviction relief proceedings it is the applicant who bears the burden of proof, not the Crown. It is insufficient, for instance, simply to point to the fact that a now discredited pathologist testified for the Crown, particularly where the new evidence advanced by the applicant has failed to address several inculpatory facts established at trial.³⁰¹ Nor should the proceedings be judicially stayed on the basis of abuse of process for serious state misconduct by medical authorities where there exists a significant circumstantial case suggesting that the child was murdered. Allowing the defendant to avoid prosecution in these circumstances would amount to a disproportionate judicial response to the misconduct.³⁰²

In Canada, process does not outweigh considerations of fairness. The principle of finality, which has deep and important roots in the Anglo-Canadian system of criminal justice, does not serve to perpetuate the imprisonment of someone shown to be innocent. Nor do issues of jurisdiction block relief in cases where a miscarriage of justice has obviously occurred. New evidence of factual innocence warrants relief in Canada, even though the conviction may have flowed from a trial that met all of the standards and expectations that exist under the common law, the *Criminal Code*, and the *Charter of Rights and Freedoms*. To answer the question asked

²⁹⁹ See e.g. *Phillion*, *supra* note 265; *CM*, *supra* note 181; *CF*, *supra* note 194; *Marquardt* 2011, *supra* note 194; *R v Trotta*, 2007 SCC 49 at para 7, [2007] 3 SCR 453, further considered in *R v MT*, 2013 ONCA 476 at paras 92–93, 299 CCC (3d) 1 [*R v MT*]; *Hay* 2013, *supra* note 263 at para 76.

³⁰⁰ See e.g. *R v DRS*, 2013 ABCA 18, 542 AR 92; *Truscott*, *supra* note 256; *R v Sophonow (No 2)*, 1986 CanLII 104 (Man CA) (acquittal entered after three trials); *Walsh*, *supra* note 256.

³⁰¹ *Simmons*, *supra* note 194.

³⁰² *R v MT*, *supra* note 299.

provocatively by US Judge Henry J. Friendly several decades ago: yes, innocence does matter, and it is not in the least bit irrelevant in Canada.³⁰³

The price to pay in Canada may be that some cases will never really be over. Verdicts that were anchored on evolving science, medicine, or technology may be subject to a continuing reassessment as the disciplines continue to be refined or change. But that is an acceptable result for any criminal justice system that recognizes the truth-seeking function of the trial process, and seeks to avoid miscarriages of justice by not allowing the principle of finality to trump the importance of getting it right in the first place.

³⁰³ Friendly, *supra* note 227. See also *supra* note 224 and accompanying text.