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## Trial by Theory: A Response to Acharya's "Law's Treatment of Science: From Idealization to Understanding"

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Gary Edmond\* and  
Kent Roach\*\*

Trial by Theory: A Response to Acharya's  
"Law's Treatment of Science: From  
Idealization to Understanding"

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*Adopting a pragmatic and empirically sensitive approach to the use of forensic science and medicine, this essay defends Edmond and Roach's "A Contextual Approach to the Admissibility of the State's Forensic Science and Medical Evidence." The authors reiterate their concerns about idealized approaches to science and expertise and question the utility of philosophically-driven and essentialist models of science for legal practice. In detail the essay explains why privileging process over outcomes in the criminal process (and even perpetuating the dichotomy) is misguided.*

*The authors affirm the importance of factual accuracy and the socio-institutional illegitimacy generated by wrongful convictions. Drawing upon recent inquiries and recommendations which confirm their concerns about endemic problems confronting contemporary forensic science and medicine—especially around the limited research base—and noting the demonstrated frailties of accusatorial trials and appeals, the authors continue to advocate "demonstrable reliability" as an admissibility prophylactic.*

*Cet essai adopte une approche de l'utilisation de la science et de la médecine légales à la fois pragmatique et qui prend le contexte en compte de manière empirique pour se porter à la défense de l'article de MM. Edmond et Roach intitulé « A Contextual Approach to the Admissibility of the State's Forensic Science and Medical Evidence. » Les auteurs réitèrent leurs préoccupations face aux approches idéalisées de la science et des compétences, et ils s'interrogent sur l'utilité, pour la pratique du droit, des modèles de sciences axés sur la philosophie et l'essentialisme. L'essai explique en détail pourquoi il est malavisé de privilégier le processus aux dépens des résultats dans le processus pénal (et même de perpétuer la dichotomie).*

*Les auteurs affirment l'importance de l'exactitude factuelle et de l'illégitimité socio-institutionnelle découlant de déclarations de culpabilité injustifiées. S'appuyant sur des enquêtes et des recommandations récentes qui confirment leurs préoccupations quant aux problèmes endémiques qui affligent la science et la médecine légales contemporaines—en particulier pour ce qui est du petit effectif de chercheurs—et soulignant les faiblesses démontrées des procès et des appels à caractère accusatoire, les auteurs continuent à insister pour que la fiabilité des affirmations soit démontrée avant qu'elles ne puissent être admises en preuve.*

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*Introduction*

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*Introduction*

In this essay we respond to Nayha Acharya’s commentary on “A Contextual Approach to the Admissibility of the State’s Forensic Science and Medical Evidence” (hereafter ACA).<sup>1</sup> Although we are grateful for the attention she has paid to our work, we cannot agree with her argument that we rely on idealized images of science or expertise. Our intention was to take a contextual and pragmatic approach that responded to the emerging evidence about the frailties of forensic science and medicine and the traditional accusatorial trial.

Notwithstanding the title of Acharya’s essay, it is also our contention that her approach to expert evidence and legal procedure is far more idealistic than our own. Moreover, it risks reifying existing legal practices while providing little sense of how or why rules and procedures should be reformed. In particular, we disagree with Acharya’s contention that the “procedural legitimacy” she attributes to the existing criminal justice system justifies a range of outcomes, including procedurally regular but wrongful convictions of the innocent.

ACA was intended as a response to emerging problems with the forensic sciences and trial safeguards resulting in the admission of

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1. (2011) 61 UTLJ 343 [Edmond & Roach]; Nayha Acharya, “Law’s Treatment of Science: From Idealization to Understanding” (2013) 36 Dal LJ 1.

speculative expert opinion evidence, inadequate assessment at trial, and wrongful convictions. Here we are referring to the report of the National Academy of Sciences (NAS), a large volume of scholarly criticism, as well as inquiries and reports (e.g., Law Commission of England and Wales) undertaken in the aftermath of both the NAS report and unfolding miscarriages of justice and wrongful convictions in Canada (e.g., the Goudge Inquiry) and beyond (e.g., the Scottish Fingerprint Inquiry).<sup>2</sup> Drawing on criminal justice principles—such as the importance of factual rectitude, fairness, and not convicting the innocent (a legally-inflected version of rectitude that orients procedures and practices from the burden and standard of proof to the admissibility of some kinds of evidence)—we endeavoured to craft a response that incorporated these values in ways that paid attention to emerging evidence. This is why we described our proposal as “contextual (or reflexive).”<sup>3</sup>

We advocated the introduction of a more demanding admissibility standard—namely, “demonstrable reliability”—to prevent insufficiently reliable forensic science and medicine from contaminating criminal proceedings. We would prevent juries being exposed to unreliable and speculative opinions from well-credentialed and experienced witnesses—particularly those proffered by prosecutors. Part of this exclusionary orientation is derived from familiarity with contemporary criminal proceedings and the frailty of trial safeguards. Serious limitations with expert opinion evidence are not always identified, nor adequately conveyed to fact-finders at trial or appellate judges on review. This means that legal aspirations and principles, particularly the concern with “doing justice in the pursuit of truth,” are routinely compromised in practice.<sup>4</sup> To help lawyers, trial judges, and expert witnesses with the interpretation of “demonstrable reliability” we explained that *Daubert*-style criteria will often be helpful *in criminal justice settings*. Acknowledging the need for flexibility in the development and application of any admissibility standard it is, nevertheless, our contention that when challenged the state should be able to support its proffer of incriminating expert opinion evidence with

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2. Commission on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* (Washington, DC: National Academies Press, 2009) [NAS report]; Law Commission of England and Wales, *Expert Evidence in Criminal Proceedings in England and Wales*, 34 Law Com Report No 325 (London: HMSO, 2011); Hon Stephen Goudge, *Inquiry into Pediatric Forensic Pathology* (Toronto: Queen's Printer of Ontario, 2008) [Goudge Inquiry]; Lord Campbell, *The Fingerprint Inquiry Report* (Edinburgh: APS Group Scotland, 2011).

3. Edmond & Roach, *supra* note 1 at 396.

4. This formulation is taken from HL Ho, *A Philosophy of Evidence Law: Justice in the Search for Truth* (Oxford: Oxford University Press, 2008).

evidence of ability and accuracy. That is, there should be good grounds for believing that the techniques and derivative opinions relied upon by the state are trustworthy.<sup>5</sup>

In this vein we proposed an *asymmetrical* approach to admissibility. We stated a preference for imposing a more onerous admissibility standard upon the state than the accused when it comes to adducing expert opinion evidence. For it is the state that adduces the vast majority of this evidence and only the state has the resources and responsibility to undertake the necessary empirical evaluation. We suggested that this position could be grounded in criminal justice values, but also linked it to revelations about the forensic sciences and ordinary trial practice. Nevertheless, our support for asymmetry was qualified. To the extent that an expressly asymmetrical standard was unpalatable, we explained that an admissibility standard based on the need for demonstrable reliability applied *symmetrically*, to the state and those accused of criminal acts, would reduce the risk of substantial unfairness, factual errors, and wrongful convictions. One of our premises is that unreliable and speculative opinions have no place in the accusatorial criminal trial.

*Acharya on law and science: the primacy of “procedural legitimacy”*

Criticizing ACA and work by Haack (also discussed in this volume) as idealized,<sup>6</sup> Acharya suggests that our approach is excessively empirical.<sup>7</sup> She argues that our call for empirical and experimental evidence as the basis for grounding the admissibility of forensic science and medicine evidence distorts proper legal practice.<sup>8</sup> In contrast to our interest in the reliability of techniques relied upon by the state, Acharya places emphasis on how law and science each obtain their “legitimacy through adherence to procedure.”<sup>9</sup>

For science, the procedures are said to include “the scientific method”—a version of Popperian falsification including scope for replication—along with peer review.<sup>10</sup> This leads Acharya to conclude that the “work of scientists is...legitimately scientific if it follows the current

5. This draws, for example, from the definition of “knowledge” in *Daubert v Merrell Dow Pharmaceuticals Inc*, 509 US 579 (1993) and the US Federal Rule of Evidence [FRE] 702. See also Uniform Evidence Law, s 79(1) and *R v Tang* (2006), 65 NSWLR 681.

6. As Haack is also responding we focus exclusively on our own work.

7. The juxtaposition of idealization and excessive empiricism is, itself, curious.

8. Acharya, *supra* note 1.

9. *Ibid* note 1 at 3. Though not developed by Acharya, this approach has an autopoietic flavour, see, e.g., G Teubner, *Law as an Autopoietic System*, translated by Anne Bankowska & Ruth Adler (Oxford: Blackwell, 1993).

10. Compare Gary Edmond & David Mercer, “What Judges Should Know about Falsificationism” (1997) 5 Expert Evidence 29.

accepted methodologies, or rules of procedure. ...Scientific validity can be thought of as depending on following a method consisting of rules and procedures in a similar way that law does."<sup>11</sup>

According to Acharya, law's rules and procedures are concerned with "accuracy in fact-finding" but constrained by "the need for timely dispute resolution, economic constraints, and numerous sources of error [such as 'evidentiary gaps'] that exist within the adjudicative process."<sup>12</sup> The legal system accepts that there will be evidentiary gaps created by trying to determine events "that occurred in the past."<sup>13</sup> Moreover, legal rules sometimes restrict (i.e., exclude) "useful evidence."<sup>14</sup> "In short, the legal system accepts the inevitability of evidentiary gaps—sometimes it even causes them."<sup>15</sup> The uncertainty that results from the evidentiary gaps means there is always a risk of error.<sup>16</sup>

In criminal proceedings, according to Acharya, uncertainty is managed through the burden and standard of proof. The state, in consequence, is required to prove the elements of any offence beyond reasonable doubt. The legitimacy of the "adjudicative process" is maintained despite risks of discrepancies between "legal fact-finding and actual fact" by making the allocation of risk, in areas of uncertainty, *fair*. Echoing Laudan's philosophical discussion of the "distribution of errors," "the burdens of proof represent a fair allocation of the risk that erroneous fact-finding occurs."<sup>17</sup> Using, for the sake of illustration, a standard of ninety-five per cent to represent proof beyond reasonable doubt, Acharya argues that the high burden is fair and that: "if there is an error, it is much more likely to fall on the side of not-guilty than guilty."<sup>18</sup>

While we have reservations about this mechanistic description of proof, Acharya's claims for the ability of procedures to instantiate legitimacy for both law and science become even stronger.

This description is incomplete, however, because it suggests that conditions of uncertainty result in the legal system being inevitably

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11. Acharya, *supra* note 1 at 9-10, see also 7, 16.

12. *Ibid* at 10.

13. *Ibid* at 13.

14. *Ibid*.

15. *Ibid*.

16. *Ibid* at 12.

17. *Ibid* at 12. Larry Laudan, *Truth, Error, and Criminal Law: An Essay in Legal Epistemology* (Cambridge: Cambridge University Press, 2005). Laudan's challenging text is self-consciously driven by theoretical commitments and abstract approaches to rules and criminal justice practice. Unfortunately, it does not focus attention on scientific evidence, notwithstanding Laudan's eminence as a philosopher of science.

18. Acharya, *supra* note 1 at 13.

flawed, and that fair allocation of risk is the band-aid covering the errors that will inevitably result. I suggest, however, that when adjudicative decisions are made based on legal facts that do not correspond with actual reality, such decisions are not necessarily illegitimate. Adjudicative decisions made based on inaccurate fact-finding are nonetheless legitimate legal decisions *if* they adhere to procedural rules, much in the same way as scientific outcomes can be legitimately scientific even if they do not represent the factual reality.<sup>19</sup>

According to Acharya, “[a]djudicative outcomes that do not correspond with factual reality can still be legitimate.”<sup>20</sup> The potential unpalatability of “legal facts”—those inconsistent with reality—is overcome through procedural propriety.<sup>21</sup>

Consequently, an adjudicative decision is legitimate when the fact-finder makes a decision based on the evidence that is properly before her at trial and appropriately measures that evidence to the relevant standard of proof. Whether the adjudicative decision corresponds with factual reality does not *itself* compromise the legitimacy of the resulting adjudicative decision.<sup>22</sup>

We will criticize this approach in the fourth part of this comment, but at this juncture it is important to understand that Acharya supports the procedural legitimacy of the law even when it produces incorrect decisions. That is, arrives at conclusions that are inconsistent with scientific knowledge—which in her view “is clearly more dedicated to empirical truth than law.”<sup>23</sup>

This strong distinction between the defining procedures of law and science, leads Acharya to criticize our proposal on the basis that we exhibit “a preference for empirical inquiry and an under-emphasis on procedural legitimacy in law.”<sup>24</sup> In Acharya’s view the emphasis placed on “empirical testing to establish demonstrable reliability” in ACA seems to suggest a “risky preference for empirical reasoning that”<sup>25</sup> has the potential to “cause an inadvertent usurping of legal reasoning.”<sup>26</sup> Indeed, our major transgression seems to have been the “use of science-like constructs to

19. *Ibid* at 13. Interestingly, *Daubert*’s attempt to distinguish between methods and conclusions was quickly abandoned in *General Electric Co v Joiner*, 522 US 136 (1997).

20. Acharya, *supra* note 1 at 13.

21. For Acharya, “legal facts” are the procedurally legitimate result of the proper combination of evidence, procedures, and substantial law.

22. Acharya, *supra* note 1 at 13-14.

23. *Ibid* at 15.

24. *Ibid* at 17.

25. *Ibid* at 24.

26. *Ibid*.

re-introduce legitimacy into the trial process," thereby revealing an "over-commitment to empirical legitimacy."<sup>27</sup>

When it comes to our principle-based and evidence-sensitive proposal for an admissibility standard applied differentially to the state and those it accuses, somewhat curiously, our motivations are reduced to concerns about:

(1) lack of scientific literacy among lawyers and judges and (2) economic imbalances that result in the state having much better access to experts than defendants.<sup>28</sup>

For Acharya, our position exhibits a "two wrongs make a right" flavour, such that the disadvantages facing the defence warrant under-valuing strict "consistency in procedure as a requirement of achieving legitimate adjudicative outcomes."<sup>29</sup>

In addition, our presentation of demonstrable reliability as "an attempt to restore some legitimacy to the criminal trial process," "compromised due to practical inequalities," is characterized as "imbalanced," "improper," "distorting," and "exclusively" oriented to the "protection of the accused."<sup>30</sup> Concentrating on "how detrimental the trial process is to the accused" leads us to "under-emphasize that the burden of proof enormously favours the accused."<sup>31</sup> Acharya insists that "altering the procedural admissibility rules through which evidence is presented to the trier of fact is an unjustifiable compromise to legal procedure" caused by our "(credible) over-emphasis on protection of the accused."<sup>32</sup> Our failure to consider the effects of an asymmetrical evidentiary standard on the burden of proof is "particularly detrimental" because "the burden of proof (itself a representation of criminal justice values) is part of the substantive criminal law that dictates what standard of proof the evidence must attain in order for an element of an offence to be legally proven."<sup>33</sup> This approach, it is said, "undermines the substantive burden of proof... making it harder for the Crown to meet its burden of proof."<sup>34</sup>

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27. *Ibid* at 28.

28. *Ibid* at 22.

29. *Ibid* at 22.

30. *Ibid* at 26.

31. *Ibid*.

32. *Ibid* at 27.

33. *Ibid* at 26.

34. *Ibid*.



### I. *Against idealism (and essentialism) in the sciences*

In commencing our response, there are two important points to make. First, we explicitly reject idealized and essentialized models of science. Second, it is our contention that the philosophy of science has not provided a legally serviceable description of the nature of scientific practice or reasoning. Indeed, we would contend that the sciences are so historically contingent and varied that there are no essential (or prescriptive) procedures that apply across the spectrum.<sup>35</sup> We doubt whether a philosophically-driven model of science would be particularly useful to *legal practice*.<sup>36</sup> In consequence, we find Acharya's descriptions of science and law and their putative methods simplistic. To the extent that her response is predicated upon maintaining a consistent methodological distinction between law and science and, more importantly, grounding legal and scientific practice in clear and prescriptive procedures, we find claims about legitimacy derived through procedural regularity (and consistency) implausible.<sup>37</sup>

Writing in response to an essay that accuses us of idealizing science, it seems important to introduce some of the inconsistent evidence up front.<sup>38</sup>

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35. Even a sociologist of science such as Harry Collins, who now suggests that there are some features that distinguish (gravitational) science from other pursuits, does not suggest that these can be used as rules to resolve debates or controversy. See H Collins, *Gravity's Ghost: Scientific Discovery in the Twenty-First Century* (Chicago: University of Chicago Press, 2011), especially "Envoi." Compare S Shapin, *Never Pure: Historical Studies of Science as if it Was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority* (Baltimore, MD: Johns Hopkins University Press, 2010).

36. Typically, most philosophers (and even some sociologists) of science are insensitive to legal practice and most legal practitioners (and scholars) are insensitive to philosophy, and especially the history, philosophy, and sociology of science. See, for example, Brian Leiter, "The Epistemology of Admissibility: Why Even Good Philosophy of Science Would Not Make for Good Philosophy of Evidence" (1997) BYUL Rev 803.

37. Sociological accounts, drawing upon the later work of Wittgenstein, have explained how difficult narrow method protocols and even scientific norms are to apply in particular situations, and especially in times of uncertainty and controversy. See, e.g., H Collins, *Changing Order: Replication and Induction in Scientific Practice* (London: Sage, 1985); M Mulkay & N Gilbert, "Putting Philosophy to Work: Karl Popper's Influence on Scientific Practice" (1981) 11 *Philosophy of the Social Sciences* 389; H Collins & T Pinch, *The Golem: What Everyone Should Know about Science* (Cambridge: Cambridge University Press, 1993).

38. Edmond was originally trained in the history and philosophy of science and is a regular contributor to specialist sociology (and social studies) of science journals. His honours supervisor was a doctoral student of Thomas S Kuhn at Princeton University from 1969 to 1973. In addition, Edmond has written several essays cautioning about judicial idealization of science. This background and the body of published work does not preclude the possibility of idealization, but it ought to caution against approaching ACA as an attempt to impose idealised images of science on law or misconstrue law and legal practice. See, e.g., Gary Edmond, "Judicial Representations of Scientific Evidence" (2000) 63 *Mod L Rev* 216 [Edmond, "Judicial Representations"]; Gary Edmond, "Supersizing *Daubert*: Science for Litigation and Its Implications for Legal Practice and Scientific Research" (2007) 52 *Vill L Rev* 857 [Edmond, "Supersizing *Daubert*"]; Gary Edmond & David Mercer, "Trashing 'junk' science" (1998) 3 *Stan Tech L Rev*; Andrew Ligertwood & Gary Edmond, *Australian Evidence: A Principled Approach to the Common Law and the Uniform Acts*, 5th ed (Sydney: LexisNexis, 2010).

In ACA we repeatedly explained that we are writing against an idealized or essentialist approach to the sciences.<sup>39</sup>

Examples of such commitments and the need for caution include:

Rather than focus upon features of idealized versions of science such as are associated with essentialized readings of *Daubert*, it is our contention that admissibility decisions should be *primarily* shaped by legal principle and criminal-justice values.<sup>40</sup>

Unfortunately, there is no simple way to identify reliable knowledge or distinguish scientific from non-scientific activity. The contextual approach advocated in this article encourages judges to develop and apply standards tailored to particular expertise and particular controversies.<sup>41</sup>

#### **ACTUAL RELIABILITY RATHER THAN 'SCIENCE,' 'NON-SCIENCE,' OR *DAUBERT***

In many ways, the questions of whether *Daubert* embodies the essentials of genuine science and whether we can develop useful means of demarcating science from other types of knowledge and experience are distractions. Rather than getting bogged down in sterile and intractable attempts at demarcation or efforts to characterize particular attributes as essential ingredients of the modern sciences, we suggest that the *Daubert* criteria do not embody the essence of all authentic scientific activity and, importantly, that the more fundamental issue for criminal investigations and trials is the *actual reliability* of incriminating expert opinions. Regardless of whether some technique, method, or ability is characterized as science-based or experience-based, given the high stakes of the criminal trial (and its obvious deficiencies), the admissibility of incriminating expert opinion should be dependant on evidence of its reliability that is empirical and demonstrative. The Supreme Court of

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39. For the purposes of this essay, there is no need to distinguish between these terminologies.

40. Edmond & Roach, *supra* note 1 at 396-397, 346.

41. *Ibid* at 405.

Canada's decision in *Trochym* has great potential in this regard. It rejects the idea that threshold-reliability concerns should be limited to novel science or left to weight.<sup>42</sup>

Our concerns with idealization *and its dangers for legal practice* are palpable.

In addition, we endeavoured to distinguish ourselves from commentators who base their criticisms of the forensic science and reform aspirations primarily on idealized images of science:

Although our proposed approach to admissibility borrows from the emphasis on reliability, testing, peer review, publication, the determination of error rates, and the need for more rigorous gate-keeping promoted in the *Daubert* decision (though most conspicuous in civil proceedings), it differs from the model of science presented in *Daubert* and championed by most of the prominent critics of the forensic sciences by being more *contextual*. Rather than invoke philosophically driven, idealized models of science, with which to contrast extant forensic science and medical practice, our approach is instead grounded in the specific values and purposes of criminal justice, empirical studies of experience with *Daubert* and wrongful convictions, an authoritative review of the forensic sciences in the United States, and empirically sensitive approaches to science and expertise drawn from post-Kuhnian science studies.<sup>43</sup>

Generally, critics of the forensic sciences have portrayed the *Daubert* criteria as an accurate description of the essential ingredients of authentic (or normal) science and have used such representations to make pejorative comparisons with institutionalized forensic science and medicine.<sup>44</sup>

There is also a danger that imposing standards based on idealized models of science—idealization common to *Daubert*, the forensic science critics, and now the NAS report—may encourage the generation of exceptions capable of accommodating many forms of expert-opinion evidence based on experience, intuitive appeal, or perceived need.<sup>45</sup>

Our invocation of the *Daubert* criteria—or other serviceable criteria—to inform the determination of the admissibility of expert opinion evidence *in criminal proceedings* was not intended to idealize science, nor to suggest that they should be understood as essential indicia of science:

42. *Ibid* at 399-400.

43. *Ibid* at 346-347. See Acharya, *supra* note 1 at 26.

44. Edmond & Roach, *supra* note 1 at 368.

45. *Ibid* at 373.

Our proposed approach to admissibility is informed not only by the values and context of criminal justice but also by the content of the particular form of expertise that is offered as testimony. This means that judges and lawyers must not rely solely on the idealized and abstract vision of proper science implicit in *Daubert* but should also attend to the limitations of techniques and the controversies in the particular field from which the expert evidence derives.<sup>46</sup>

In the context of the adversarial trial and in response to incriminating expert evidence, the *Daubert* criteria, especially testing, can provide, in many and perhaps most criminal cases, serviceable resources for approaching the question of whether incriminating expert evidence is sufficiently reliable to admit. Unlike the mandatory *Mohan* factors—concerned with the *admissibility* of novel expert evidence—the *Daubert* criteria are specifically focused on indicia of reliability.<sup>47</sup>

Instead, it is our contention that such criteria can actually assist in assessing the probative value of techniques and derivative opinions for both admissibility and weight.<sup>48</sup>

Acharya candidly acknowledges some of our concerns and even reproduces a number of passages and sentences where we explicitly reject idealized (or essentialist) models of science and expertise. She states:

Although they suggest that the *Daubert* criteria are helpful in determining demonstrable reliability, Edmond and Roach do not subscribe to the *Daubert* court's notion that the *Daubert* criteria are indicative of scientific reliability, nor its idealized image of science or scientific reliability. ...A number of elements from Edmond and Roach's route are agreeable. They fairly point out that "[i]n many ways, the questions of whether *Daubert* embodies the essentials of genuine science and whether we can develop useful means of demarcating science from other types of knowledge and experience are distractions." I agree. They are distractions because the relevant concern is not whether evidence is "scientific" or not, so determining if the *Daubert* criteria appropriately characterize science is non-essential. Moreover, as Edmond and Roach imply, expert evidence should be treated consistently in the legal process whether the evidence can be labeled scientific or not. That is, "non-science" or "experience-based" expert evidence ought to be legally reliable just as scientific expert evidence should.<sup>49</sup>

46. *Ibid* at 349.

47. *Ibid* at 400.

48. Consistent with a rigorous approach to the *Daubert* criteria, the Law Commission's desiderata in its draft bill, and considerations advanced in Gary Edmond, "Pathological Science? Demonstrable Reliability and Expert Pathology Evidence" in Kent Roach, ed, *Pediatric Forensic Pathology and the Justice System* (Toronto: Queen's Printer for Ontario, 2008) 96.

49. Acharya, *supra* note 1 at 23-24.

Moreover, on several occasions Acharya recognizes that we endeavour to ground our approach to admissibility in accordance with criminal justice values rather than in (idealized) epistemology or philosophically-driven models of science. This is perhaps most explicit in the following passage, reproduced at the beginning of Acharya's discussion of ACA.

It is the importance we ascribe to the presumption of innocence, to avoiding the conviction of the innocent, the premium placed on fairness and accuracy, the difficulty of challenging incriminating expert evidence in the context of the accusatorial criminal trial, along with the very real limitations of supposed trial safeguards (e.g., warnings to juries), that encourage us to recommend the imposition of fairly onerous standards in the determination of whether the state's forensic scientists (and other experts) should be entitled to express incriminating opinion in the criminal proceedings.<sup>50</sup>

Given this recognition, we find it difficult to understand how we could be considered to be promoting an idealized image of science.

Somewhat ironically, we would contend that it is Acharya who is the idealist. She offers a method-predicated model of scientific practice that is inconsistent with the evidence assembled by scholars, particularly sociologists, historians, and anthropologists, who have actually studied science in situ following the seminal work of Thomas Kuhn. Moreover, when discussing the *Daubert* criteria she suggests, just as her description of scientific procedure implies, that they encapsulate the essential ingredients of science. Notably, the *Daubert* decision is said to have "marked the beginning of using scientific criteria to address legal reliability."<sup>51</sup> Remarkably, science as Acharya understands it—with its efficacious (falsificationist) method and commitment to peer review—is not to be used by courts to assist with admissibility gatekeeping or decision-making.

It is probably a mistake generally, though certainly inappropriate here, to descend into a detailed discussion of the philosophy of science when discussing legal practice and reform.<sup>52</sup> We are not idealists, and this in part explains, our lack of explicit attention to the philosophy

50. Edmond & Roach, *supra* note 1 at 403; Acharya, *supra* note 1 at 21.

51. *Ibid* at 5.

52. See S Jasanoff, *Science at the Bar* (Cambridge, MA: Harvard University Press, 1995); Adina Schwartz, "A 'Dogma of Empiricism' Revisited: *Daubert v Merrell Dow Pharmaceuticals, Inc* and the Need to Resurrect the Philosophical Insight of *Frye v United States*" (1997) 10 Harv J L & Tech 149; David Caudill & Richard Redding, "Junk Philosophy of Science? The Paradox of Expertise and Interdisciplinarity in Federal Courts" (2000) 57 Wash & Lee L Rev 685; Susan Haack, "An Epistemologist in the Bramble-Bush: At the Supreme Court with Mr. Joiner" (2001) 26 J Health Pol 217; D Caudill & L LaRue, *No Magic Wand: The Idealization of Science in the Law* (Lanham, MD: Rowman and Littlefield, 2006).

of science (or attempts to define science and expertise), or the more practically informative history, sociology, and anthropology of science. Furthermore, we do not believe that the philosophy of science, per se, will necessarily provide practical perspectives on the sciences, with one important exception. Perhaps the only immediately useful insight which underpins our consciously empirical approach is the idea that there is no universal scientific method and no simple demarcation criterion.<sup>53</sup> Generally accepted by historians, sociologists and philosophers (and many scientists), the lack of a universal efficacious method means that in many cases, though particularly in novel areas and in times of controversy, there is no simple procedural means of determining what is good as opposed to bad practice or knowledge, and that boundaries around science and non-scientific activities are often flexible and even porous.<sup>54</sup> These insights are not grounds for despair, nor do they impair humanistic approaches to understanding the sciences and expertise.<sup>55</sup> Rather, as we suggested in ACA, they require legal institutions to seriously reflect upon the terms on which they engage with exogenous expertise and knowledge. "Demonstrable reliability" is not an attempt to usurp the autonomy or independence of law and legal practice. For, lawyers and judges, steeped in their slowly evolving legal traditions, will need to develop its meaning through practice.

We also make reference to *Daubert*, but in a more qualified capacity. Our promotion of *Daubert*-style criteria as useful admissibility *heuristics* is based on the possibility of forensic scientists (and others) being able to evaluate their techniques and proficiency empirically.<sup>56</sup> Our admissibility standard places emphasis on empirical assessment and evidence of ability and error, not because these are necessary elements of all (good) science, but rather because if the state intends to rely upon techniques and derivative opinions to support proof then it should be attentive to their value. In many cases, experimental testing, validation, and proficiency studies will provide the kinds of information that ought to inform our assessment of *admissibility*—as well as the *weight* to ascribe to expert opinions. We suggest that the *Daubert* criteria, and similar lists (e.g., those associated

53. See Edmond, "Judicial Representations," *supra* note 38 and Caudill & LaRue, *supra* note 52.

54. See, e.g., J Schuster & R Yeo, eds, *The Politics and Rhetoric of Scientific Method* (Dordrecht: Reidel, 1986); T Gieryn, *Cultural Boundaries of Science: Credibility on the Line* (Chicago: University of Chicago Press, 1998).

55. See, e.g., H Collins & R Evans, *Rethinking Expertise* (Chicago: University of Chicago Press, 2007).

56. We accept that some areas of science and medicine and many areas of non-science will have difficulty generating empirical evidence, or at least in a form that provides validation or error rates. We believe that legal institutions can respond sensitively.

with the Law Commission's draft bill) provide a useful set of resources to assist with such assessments. These criteria, if applied rigorously, are reasonably demanding, and are especially suited to determining the utility of techniques in regular use.<sup>57</sup>

We acknowledge that there will be complex debates around what levels of accuracy ought to sustain admissibility and what to do about fields or areas where testing and evaluation is difficult—as in the simmering controversy around *Abbey*.<sup>58</sup> There will also be debates about whether the strength of the case can mediate admissibility.<sup>59</sup> These however should not prevent a general interest in empirical evidence in most, and perhaps all, circumstances. Moreover, we contend that demonstrable reliability does not necessarily undermine traditional legal practice. Rather, a slightly higher admissibility standard will have a range of system benefits regardless of whether it is applied asymmetrically or symmetrically.

The invocation of “demonstrable reliability” in the *realm of criminal justice* is intended to focus more attention on admissibility decision-making and exclusion. It is also intended to provide a beacon to investigators, forensic scientists, and lawyers. Historical admissibility practice has produced a range of undesirable practices and quasi-knowledges. Liberal admissibility standards make forensic scientists less inclined to study or improve their techniques, and techniques that are unreliable or speculative tend to be admitted and relied upon to support guilt.

## II. *The poverty of formalism (and the need for engagement)*

Both fields...are able to produce legitimate outcomes through adherence to procedure.<sup>60</sup>

Acharya places considerable emphasis and reliance on “legitimacy through adherence to procedure.”<sup>61</sup> She accepts that accuracy in fact-finding is fundamental to legal practice but has a tendency to excuse factual error, given conditions of uncertainty.<sup>62</sup> We accept that there can be uncertainty, but our concerns are restricted to forensic science and

57. The NAS report generally supports this approach. See Law Commission of England and Wales, *supra* note 2.

58. Compare our respective positions: Edmond & Roach, *supra* note 1 at 391-395; Acharya, *supra* note 1 at 24-25. See also *R v Aitken*, 2012 BCCA 134.

59. Though we would contend that the strength of the case should not mediate the admissibility of incriminating expert opinion evidence, especially if the analysts knew about prejudicial or incriminating evidence that was not relevant to their analyses.

60. Acharya, *supra* note 1 at 7, 10.

61. *Ibid* at 3.

62. See B Campbell, “Uncertainty as symbolic action in disputes among experts” (1985) 15 Soc Stud Sci 429.

medicine, and particularly techniques in regular use. We believe that insufficient attention to the reliability of incriminating expert opinions contributes to substantial unfairness and increases the risk of error—and often obscures the extent of (un)certainty. The kinds of excuses invoked by Acharya—"the need for timely dispute resolution, economic constraints, and numerous sources of error that exist within the adjudicative process"—are not particularly applicable to forensic sciences in routine use.<sup>63</sup> In our view, the state has the resources and abilities to evaluate forensic science and medicine techniques and should do so where it relies on derivative expert opinion evidence.

Acharya's commentary risks privileging form over substance. Without trivializing the importance of facts or factual accuracy, Acharya consistently affirms the primacy of legal rules and procedures. This enables her to declare that: "[t]he legitimacy of adjudicative outcomes is not dependent on consistency with actual reality."<sup>64</sup> We do not share this approach. For us, legal rules and procedures are designed to achieve particular ends—ends driven by criminal justice aspirations and principles. They should be designed and operate in ways that produce factually accurate outcomes so that the innocent are not convicted. These commitments have very long legacies in both commentary (often associated with Jeremy Bentham, and Hale and Blackstone, respectively) and case law. We accept that procedures are important, as is their consistent application, though it is our contention that the main goal of the criminal trial is "to do justice in the pursuit of truth."<sup>65</sup> Acharya has reified legal procedures and allowed rules and procedures to rise above their purpose(s). Adjectival rules are to facilitate the ends of justice, they are not an end in themselves.

While willing to acknowledge the importance of procedure, we are far from persuaded that "following procedural rules maintains the legitimacy of adjudicative decisions, even if some substantive wrong occurs."<sup>66</sup> Whereas Acharya is content to accept that "legal facts—generated through conventional legal processes—might be inconsistent with "reality" or "scientific knowledge," we are far less comfortable.

What is problematic, however, is an under-emphasis on procedural legitimacy, or the notion that consistent adherence to legal procedure is essential to maintaining legitimate adjudicative outcomes. Procedural legitimacy acknowledges that adjudicative outcomes are made in conditions of factual uncertainty, so it is inevitable that from time to

63. Acharya, *supra* note 1 at 10.

64. *Ibid* at 14.

65. Ho, *supra* note 4.

66. Acharya, *supra* note 1 at 3.



time, a legal fact will not correspond with factual reality, and an adjudicative outcome will be inconsistent with what really happened in fact. Given these circumstances, adherence to legal procedure ensures legitimate adjudicative outcomes. Considering the significance of consistent adherence to legal procedure, an under-emphasis on procedural legitimacy in preference for substantive concerns can result in inappropriate procedural compromise. ...consistent application of legal procedure is significant in maintaining the legitimacy of the adjudicative system generally, as well as the legitimacy of individual legal outcomes.<sup>67</sup>

To the extent possible, while maintaining a civil society and fair procedures, we would aim for equilibration between the “two” domains.<sup>68</sup> However, we would also place emphasis on the need to avoid certain types of discrepancies in criminal justice practice. Where a person is imprisoned and the evidence seems to suggest real doubts about their guilt or indicates innocence, we are not satisfied by “legal facts” derived through procedurally regular processes. To the extent that the system is unwilling to rectify such anomalies, outcomes are illegitimate and inconsistent with espoused criminal justice principles.

We believe that legal practice should, *as far as possible*, draw upon scientific knowledge and insights.<sup>69</sup> Apart from our non-idealist approach, our concerns are directed to stimulating improved engagement with the sciences and scientific knowledge. We are also trying to maintain law’s social legitimacy by enhancing its performance relative to espoused goals. We doubt that legal institutions can maintain, let alone enhance, their legitimacy without developing improved means of engaging with (exogenous) knowledges from beyond the law. This will involve reforming rules and processes, ongoing assessment of law reform, and continuing dialogues with other knowledge traditions. In advanced Western democracies, legal institutions cannot afford to make decisions that are “contrary to scientific knowledge” and there can be no social or political legitimacy if legal outcomes are not consistently indexed to culturally dominant epistemologies. When it comes to incriminating expert opinions,

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67. *Ibid* at 28.

68. Without wanting to embark on a detailed discussion, the forensic sciences represent an interesting example of how law, science, and investigators have historically co-produced a range of legally relevant knowledge and practices. The question is whether this co-production has been effective or, as many commentators suggest, might have generated a range of undesirable, or pathological, knowledges and practices. On co-production see S Jasanoff, ed, *States of Knowledge: The Co-production of Science and Social Order* (London: Routledge, 2006).

69. Gary Edmond, “Bacon’s chickens? Re-thinking law and science (and incriminating expert opinion evidence) in response to empirical evidence and legal principle” in J Gleeson & R Higgins, eds, *Constituting Law: Legal Argument and Social Values* (Sydney: Federation Press, 2011).

the need to pay attention to what scientists say and what goes on beyond the court is acute, even if it will not necessarily dictate the precise shape of legal procedures or particular outcomes. Legal institutions are not, and cannot claim to be, autonomous from scientific communities or society more generally.<sup>70</sup>

### III. *The illegitimacy of wrongful convictions*

As suggested above, a foundational point in Acharya's provocative article is the proposition that inaccurate results reached in legal systems retain their legitimacy if they follow legitimate procedural rules. In her words: "the legitimacy of resultant legal determination is dependent on whether the appropriate procedures were adhered to during the decision-making process"<sup>71</sup> and "adherence to legal procedure ensures legitimate adjudicative outcomes."<sup>72</sup> She stresses that the reasonable doubt standard used in criminal law ensures the legitimacy of procedural rules even when they produce wrongful convictions.<sup>73</sup> We disagree with this starting point. More importantly, we think that healthy legal systems must and do disagree with the idea that procedurally regular wrongful convictions do not undermine the legitimacy of criminal justice outcomes. In our view, the reality of wrongful convictions requires reform of procedural rules including rules concerning the admissibility of forensic scientific evidence when that evidence has contributed to convicting and imprisoning innocent people.

In terms of legal practice we begin with what the Supreme Court of Canada has said on this issue. In one of its early Charter cases, it declared that "[i]t has from time immemorial been part of our system of laws that the innocent not be punished. This principle has long been recognized as an essential element of a system for the administration of justice which is founded upon a belief in the dignity and worth of the human person and on the rule of law."<sup>74</sup> In *United States of America v Burns and Rafay*, the Supreme Court cited David Milgaard's wrongful conviction as an example of how "a fair trial does not *always* guarantee a safe verdict."<sup>75</sup> Far from suggesting that such wrongful convictions remained legitimate because

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70. See, e.g., Gary Edmond, "The law-set: The legal-scientific production of medical propriety" (2001) 26 *Sci Techn & Hum Val* 191.

71. Acharya, *supra* note 1 at 14.

72. *Ibid* at 28.

73. *Ibid* at 12. See *R v Starr*, [2000] 2 SCR 144 on the need for the reasonable doubt standard to be situated much closer to absolute certainty than a balance of probabilities.

74. *Reference re BC Motor Vehicles Act*, [1985] 2 SCR 486 at para 69.

75. *United States of America v Burns and Rafay*, [2001] 1 SCR 283 at para 98 [*Burns and Rafay*] [emphasis in original].

of the fairness of the trial, the Court in that case used emerging evidence about the prevalence of wrongful convictions as a reason to change its traditional rule that allowed fugitives to be extradited to face the death penalty. *Burns and Rafay* has rightly been hailed as one of the most important decisions under the Charter. Its reliance on new evidence and its willingness to change position suggests that in some contexts, the law can evolve in ways that are sympathetic to exogenous developments.<sup>76</sup> These cases in our view refute the idea that procedurally regular convictions of the innocent do not undermine the legitimacy of the criminal justice system. A legal system that based its claim to legitimacy on following rules, as proposed by Acharya, would tend to be static and reluctant to—perhaps incapable of—reform.<sup>77</sup>

There is ample global evidence that known wrongful convictions undermine the legitimacy of criminal justice systems. In the United Kingdom, a series of wrongful convictions following Irish terrorist attacks led to reforms that eventually led to the creation of the Criminal Cases Review Commission. Most states in the United States have enacted DNA testing legislation and a few have reconsidered the death penalty in light of widespread revelations of wrongful convictions. Even China has responded to a few notorious murder convictions—where the victim was subsequently discovered to be alive—with reforms to its criminal justice system. These include stronger commitment to review in death penalty cases and proposals for more exclusion of illegally obtained evidence.<sup>78</sup>

The Goudge Inquiry, appropriately praised by Acharya, is also an example of how known wrongful convictions affect the legitimacy of the justice system. The Goudge Inquiry was in part appointed because of the William Mullins-Johnson case in which a man served twelve years in prison following his wrongful conviction for the sexual assault and murder

76. A similar pattern is also seen in *R v Stinchcombe*, [1991] 3 SCR 326, where the Supreme Court articulated a broad new rule that the prosecutor must disclose all relevant evidence to the accused before the trial in reaction to evidence about how a lack of disclosure contributed to the wrongful conviction of Donald Marshall Jr and recommendations that Parliament adopt a new disclosure regime made in the *Royal Commission on the Donald Marshall Jr Prosecution* (Halifax: Queen's Printer of Ontario, 1989).

77. For something of a reactionary defence of the existing system, and opposition to our demonstrable reliability proposal, see Ken Chasse, "Comment: 'Junk Science' by Way of a Higher Burden of Proof" (2012) 16 Can Crim Law Rev 323 and our reply Gary Edmond & Kent Roach "Comment—A Reply to Chasse's 'Junk Science by Way of a Higher Burden of Proof'" (2012) 16 Can Crim Law Rev 391. Note however that in his reply to our reply, Chasse asserts that he is concerned with wrongful convictions. Ken Chasse "Comment—Conceding to the Edmond-Roach Reply" (2012) 16 Can Crim Law Rev 381.

78. Wu Xiaofeng "An Analysis of Wrongful Convictions in China" (2011) 36 Okla City U L Rev 451 at 466; Kandis Scott "Why did China Reform its Death Penalty?" (2010) 19 Pac Rim L & Pol'y J 63 at 72-74; Margaret K Lewis "Controlling Abuse to Maintain Control: The Exclusionary Rule in China" (2011) 43 NYU Int'l L & Pol 629 at 668-672.

of his four-year-old niece. Prosecutors and courts have subsequently and rightly apologized to Mr. Mullins-Johnson.<sup>79</sup> There was no suggestion that his conviction had no effect on the legitimacy of the criminal justice system simply because it followed orthodox procedures. Indeed, expert witnesses were heard from both sides at trial and there has been no suggestion that any of the experts in that case should not have been allowed to testify under the—"procedurally legitimate"—liberal admissibility standards that applied at the time. Mullins-Johnson's conviction was overturned not on the basis of procedural error but new evidence that cast doubt on the forensic pathology evidence offered by the Crown. Other wrongful convictions in Dr. Smith cases have been overturned despite arising from original decisions by the accused to plead guilty. This again demonstrates that procedural regularity cannot legitimate the conviction of the innocent.<sup>80</sup> The wrongful convictions stemming from the testimony of Dr. Charles Smith undermined the legitimacy of the criminal justice system in Ontario. Indeed one of the main articulated purposes of Justice Goudge's public inquiry and report was an attempt to restore public confidence in the justice system.<sup>81</sup>

Acharya's claim that the legitimacy of legal outcomes depends simply on whether appropriate legal procedures have been followed is not supported by the evidence about how the world reacts when confronted with a known wrongful conviction regardless of the procedural regularity of the process that produced it. It also suggests that law may be "more dedicated to empirical truth" than she implies.<sup>82</sup> On this basis we accept Acharya's claim that our proposal that forensic science evidence introduced by the Crown should be demonstrably reliable is "an attempt to restore some legitimacy to the criminal trial process."<sup>83</sup> We would, however, suggest that this is true of almost all responses to wrongful convictions including the recommendations following the Goudge Inquiry and recent jurisprudential refinements by the Supreme Court of Canada.

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79. *R v Mullins-Johnson*, 2007 ONCA 720.

80. *Ibid.* For cases where wrongful convictions initially obtained by guilty pleas were overturned in Dr Smith cases see: *R v Sheratt Robinson*, 2009 ONCA 886; *R v CF*, 2010 ONCA 691; *R v CM*, 2010 ONCA 690; *R v Kumar*, 2011 ONCA 120; *R v Brant*, 2011 ONCA 362.

81. "My recommendations are designed to restore and enhance public confidence in pediatric forensic pathology and its future use in the criminal justice system": Goudge Inquiry, *supra* note 2 at 437. See also at 541 and recommendation 145 noting that some of the independent and investigative attributes of the Criminal Cases Review Commission could "assist in enhancing public confidence." See also at 589 noting that a broad range of actors, including courts, have a role to play in protecting the public against flawed forensic pathology.

82. Acharya, *supra* note 1 at 15.

83. *Ibid* at 26.

#### IV. *Acceptable error or wrongful conviction rates in the criminal justice system?*

As Acharya astutely notes, there are some significant differences between the Goudge Inquiry's proposal that the trial judge impose threshold reliability standards on all expert evidence and our proposal for an asymmetrical demonstrable reliability standard with respect to forensic science evidence presented by the Crown. But she presents the differences as categorical differences on the basis that we, but not the Goudge Inquiry, believe that wrongful convictions risk undermining the legitimacy of the justice system. Here we must disagree. As suggested above, the Goudge Inquiry, like the Supreme Court of Canada, accepts that wrongful convictions have the potential to undermine legal legitimacy. The almost universal horror with which people greet known wrongful convictions is simply too strong to suggest that wrongful convictions can be seen as legitimate because proper procedures were followed.

What then explains the difference between our demonstrable reliability proposals and the less radical threshold reliability proposals of the Goudge Inquiry? Roach, in prior writings, has argued that a useful distinction can be drawn between the illegitimacy and unacceptability of known or even suspected wrongful convictions in individual cases and the systemic error rate of the criminal justice system.<sup>84</sup> Here Acharya's concerns that proposals such as ours may have unacceptable effects on the operation of the criminal justice system despite their laudable goal of preventing wrongful convictions have a very respected theoretical pedigree. Both Lon Fuller<sup>85</sup> and Ronald Dworkin,<sup>86</sup> legal theorists associated with respect for individual rights, have separately argued that even though the accused as an individual has a right not to be convicted of a crime that he or she did not commit, there is no right to the most accurate criminal justice system (or expert opinion evidence) possible.<sup>87</sup> For example, Dworkin has argued that even if it could be demonstrated that a significantly expanded jury would produce fewer wrongful convictions this does not mean all accused would have a right to such an expanded jury.<sup>88</sup> The truth of this insight is also underlined by the *reductio ad absurdum* that the best way to prevent wrongful convictions is to have no convictions at all.

84. Kent Roach, "The Protection of Innocence under Section 7 of the Charter" (2006) 34 Sup Ct L Rev 2d 249 at 255-259.

85. Lon Fuller, *The Morality of Law*, 2d ed (New Haven: Yale University Press, 1969), at 179-180.

86. Ronald Dworkin, *A Matter of Principle* (Cambridge, MA: Harvard University Press, 1985) at note 72.

87. See Gary Edmond & Andrew Roberts, "Procedural Fairness, the Criminal Trial and Forensic Science and Medicine" (2011) 33 Sydney L Rev 359.

88. Dworkin, *supra* note 86 at 88.

Viewed in this light, the difference between our demonstrable reliability standard and the more modest, albeit still reformist recommendations made by the Goudge Inquiry can be seen as involving empirical claims about the effects of alternative reforms on the functioning of the criminal justice system and about acceptable error rates within that system. Acharya suggests that the Goudge Inquiry proposals are more acceptable than ours because they can more easily be reconciled with *R v Mohan*.<sup>89</sup> We fail to understand why *Mohan* is the decisive point of reference. The Goudge Inquiry recognized that a number of subsequent decisions, including *R v J(LJ)*<sup>90</sup> and *R v Trochym*,<sup>91</sup> placed important glosses on the *Mohan* test with the former moving *Mohan* closer to *Daubert* and the latter relating unknown reliability of post-hypnosis testimony to the risk of wrongful convictions. In any event, the important point here is that even the standards recommended by Justice Goudge contemplate exclusion of some expert evidence on grounds that it does not satisfy "threshold reliability." Such exclusions, like potentially more frequent exclusions under our proposal, could increase what Acharya calls "wrongful acquittals" and perhaps harm social interests in the control and deterrence of crime.

Acharya suggests that our proposals do not give sufficient weight to "the protection of society, prevention of false acquittals, or deterrence of crime"<sup>92</sup> and "interfere with the rules governing admissibility of evidence by making it harder for the Crown to meet its burden of proof."<sup>93</sup> These may be practical outcomes but if so, they would be symptoms of our proposal rather than its motivation. They are ultimately empirical questions. In our view, existing evidence about high conviction rates<sup>94</sup> and the lack of evidence about the connection between convictions and the existence and deterrence of crime in society makes it unlikely that our admissibility standard would significantly harm these values.<sup>95</sup> But a similar though perhaps unquantifiably lower risk also accompanies the Goudge Inquiry proposals that Acharya praises. Both our and the Goudge Inquiry proposals

89. [1994] 2 SCR 9 [*Mohan*].

90. [2000] 2 SCR 600 [*J LJ*].

91. [2007] 1 SCR 239 [*Trochym*].

92. Acharya, *supra* note 1 at 26.

93. *Ibid* at 27.

94. About two-thirds of adult criminal cases result in convictions over the last decade with most of the other cases being withdrawn by the Crown. Only three per cent result in acquittals. Juristat, "Adult Criminal Court Statistics 2010–2011" at 10, online: Statistics Canada <<http://www.statcan.gc.ca/pub/85-002-x/2012001/article/11646-eng.pdf>>.

95. Canadian Sentencing Commission, *Sentencing Reform: A Canadian Approach* (Ottawa: Queen's Printer of Ontario, 1987) at ch 6.

are reform processes focused on the rules of admissibility.<sup>96</sup> The existence of the reasonable doubt standard does not, as Acharya suggests, insulate admissibility rules from legal reform in an attempt to respond to the injustice of wrongful convictions. Nor should it.

#### V. *Over-reliance on trial safeguards and the standard of proof*

One of the factors motivating our proposal for reform was emerging evidence about the frailty of contemporary practice, particularly trial safeguards and the burden and standard of proof. Along with many judges, Acharya maintains confidence in the efficacy and sufficiency of trial safeguards (e.g., cross-examination, rebuttal experts, directions, warnings and the burden and standard of proof), professional obligations (bar rules and codes of conduct) and appellate review.<sup>97</sup> In ACA (and elsewhere) we questioned this confidence. Reinforced by personal experience, developments in the aftermath of Innocence Projects and recent revelations concerning problems with many types of forensic science and medicine, we suggested that trial safeguards—whether operating individually or in combination—do not consistently or systematically expose limitations with incriminating expert opinion evidence.<sup>98</sup> In consequence, they do not necessarily assist with the evaluation of evidence, do not necessarily afford protection to the accused, and do not assure procedural fairness. They are more inconsistent and generally less effective than credible safeguards could claim to be. Moreover, liberal admissibility practice and allowing the tribunal of fact to allocate “weight” to factually weak and speculative opinions—regardless of what transpires at trial—threaten the theoretically onerous standard of proof.

Acharya’s commitments can be observed in her treatment of the burden and standard of proof. This discussion assumes a rather abstract form based around an example that equates the criminal standard of proof—beyond reasonable doubt—with ninety-five per cent. Adhering to this formalistic model, Acharya implies that the accused should be acquitted where proof ranges “anywhere from 0–94%” and convicted where ninety-five per cent or higher. She continues:

96. Justice Goudge’s terms of reference and recommendations were more broadly oriented than admissibility.

97. See Gary Edmond & Mehara San Roque, “The Cool Crucible: Forensic Science and the Frailty of the Criminal Trial” (2012) 24 *Current Issues in Criminal Justice* 51. On prosecutorial performance, see D Medwed, *Prosecution Complex: America’s Race to Convict and its Impact on the Innocent* (New York: NYU Press, 2012).

98. Here we are referring to our experience with the Goudge Inquiry and Edmond’s qualitative ethnographic study of expert evidence in Australian courts, along with our considerable experience with expert reports and appellate court decisions.

...if there is an error, it is much more likely to fall on the side of not-guilty than guilty, because if an accused is found guilty, there should only be a 5% chance that the accused is actually innocent. It is much more likely that the accused is *erroneously* found to be not-guilty than *erroneously* found to be guilty. The risk of error is therefore distributed, largely in favour of the accused.<sup>99</sup>

We accept that in theory proof is structured to protect the accused from wrongful conviction. Our concern is that the burden of proof may provide insufficient protection, especially when it comes to unreliable and speculative forensic science and medicine evidence. This is especially so when that evidence is, as it was in the Dr. Smith cases, offered on the ultimate issue of guilt or innocence.

There are, in Acharya's invocation of proof as the dominant legal safeguard, no references to research literatures or studies which suggest that the standard of proof in criminal proceedings operates in the formal way she suggests.<sup>100</sup> Perhaps the leading psychologically-based model involves fact-finders assessing evidence in terms of the most persuasive narrative—the so-called story model.<sup>101</sup> On this approach, it is not entirely clear that the standard of proof is particularly instructive in evaluating the most plausible story. The fact that the defence quite regularly fails to call much evidence, let alone advance a counter-narrative, means that the presumption of innocence may have a rhetorical salience—in line with a long formal tradition—but more limited practical value. Placing the burden of proof on the state and not requiring a response have laudable purposes. Nevertheless, the accused is still vulnerable to conviction if he or she does not offer a counter-narrative, especially in cases where the weight of science is added to the authority of the state's case.<sup>102</sup>

Another example of the confidence invested in rules and their application concerns judges (not) excluding expert opinion evidence where the prejudicial effect of evidence outweighs its probative value. Acharya places emphasis on this admissibility rule/safeguard as part of her

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99. Acharya, *supra* note 1 at 12.

100. Again, this has similarities with Laudan's neo-Benthamite preference for admission of all relevant evidence (sometimes described as *free* or *natural* proof) and reliance on the burden and high standard of criminal proof.

101. N Pennington & R Hastie, "Explaining the Evidence: Tests of the story model for juror decision making" (1992) 62 J Pers Soc Psychol 189, discussed in Gary Edmond & David Hamer, "Evidence Law" in P Cane & H Kritzer, eds, *The Oxford Handbook of Empirical Legal Research* (New York: Oxford University Press, 2010).

102. See Emma Cunliffe, *Murder, Medicine and Motherhood* (Oxford: Hart Publishing, 2011) for a compelling demonstration that the conviction of an Australian woman, Kathleen Folbigg, of killing her four infants, did not satisfy the legal standards of proof beyond a reasonable doubt.



discussion of “procedural legitimacy.”<sup>103</sup> Ironically, this example illustrates the importance of demonstrable evidence of reliability. Without empirical evidence about ability and accuracy of techniques, how are we to determine probative value (or the danger of unfair prejudice)?<sup>104</sup> The danger of unfair prejudice will be acute where the opinion appears or is represented as probative but might not be—that is, where it is unreliable or speculative. There is no evidence that epistemic limitations are systematically, or even routinely, identified and conveyed at trial. Similarly, there is no evidence that safeguards such as cross-examination, rebuttal experts and judicial directions effectively moderate the interpretation of incriminating opinions. Low admissibility standards and indifference to actual reliability (i.e., probative value) tend to undermine proof and may actually impose a reverse burden, perversely requiring the accused to demonstrate that incriminating opinions adduced by the state are not reliable.<sup>105</sup>

Interestingly, having noted our concerns about the prevalence of unreliable and speculative forensic science and medicine evidence, Acharya never responds. We can only assume that the faith she invests in procedural propriety, trial safeguards and especially the standard of proof, affords adequate protection to the accused from unreliable and speculative expert opinions.<sup>106</sup>

## VI. *Asymmetry and modular approaches to expertise*

Our concern with both criminal justice aspirations and values *and* practice led us to advance an asymmetrical approach to admissibility in criminal proceedings and to suggest that legal values and practical needs rather than idealized (or essentialized) models of science should be driving admissibility standards and their application.

### 1. *Asymmetry*

Our support for an asymmetrical approach to admissibility cuts several ways. First, our non-idealized approach to expertise means that we do not (and did not) commit to extending demonstrable reliability to other legal domains relying upon expertise. ACA was expressly restricted to the realm of criminal justice. Secondly, and more controversially for Acharya, we express support for an asymmetrical approach to admissibility between the state and the accused. Not only do we believe that this embodies criminal

103. Acharya, *supra* note 1 at 4.

104. See, for example, the discussion in *Dupas v The Queen*, [2012] VSCA 328 around the probative value/unfair prejudice discretion.

105. Gary Edmond, “Specialised knowledge, the exclusionary discretions and reliability: Reassessing incriminating expert opinion evidence” (2008) 31 UNSWLJ 1.

106. Acharya, *supra* note 1 at 21 note 60.

justice values, but in many ways it reflects common law thinking—if not always practice.<sup>107</sup> Historically, accusatorial systems have been interested in the factual guilt of the accused and, in general, have endeavoured to accommodate evidence supporting non-guilt or innocence—especially at trial.

One way to defuse the apparently (or allegedly) disruptive nature of our proposal is to contrast it with actual practice in recent years. In many cases the state was allowed to call upon highly credentialled and/or experienced forensic scientists (and physicians) to express their speculative opinions about issues closely related to guilt. We recommend that such opinions should not be admitted unless there are good reasons to believe (on the balance of probabilities) that they are demonstrably reliable. We would, however, allow the accused to adduce expert opinion evidence that might not be demonstrably reliable. This would not become a free-for-all. Expert witnesses called by the defence would have to satisfy some standard pertaining to qualifications and experience, and maybe even offer some reason to think their opinions possess significant (i.e., non-trivial) probative value. Here it seems salient to remind our critics that in practice, the state did little more than this for over a century. Such a concession would enable those accused who can identify and afford an expert able to credibly opine on a relevant issue, a reasonable opportunity to have evidence consistent with their non-guilt heard. Moreover, to prevent the accused having some kind of tactical advantage, we explained that in the few cases where the accused calls an expert to offer primary evidence the state could respond in kind.<sup>108</sup> That is, expert witnesses responding to this evidence would not have to satisfy the demonstrable reliability standard.

These modifications involve tweaking a small part of a large system. Admittedly controversial, if introduced they would not undermine the procedural legitimacy of criminal proceedings. Rather, they would create a new equilibrium where what counted as procedurally legitimate was slightly modified. Because we do not maintain essentialized models of science and law, and believe that the manner in which criminal justice principles should find expression is interpretively open, this does not constitute a problem for us.

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107. This was exemplified in the Law Commission's recent report, see *supra* note 2 at 3.82–3.84.

108. We accept that psychiatric evidence might be an exception, but the state is well positioned to counter such evidence, and there are longstanding problems with legal approaches to mental illness, normalcy and responsibility.

## 2. *Modularity*

In ACA, as part of our response to science and expertise, we indicated that judges should develop evidence jurisprudence in ways that are consistent with principle and simultaneously improve practice. Because our approach to admissibility is responsive to legal principles, extant practice, and insights from the history, philosophy and sociology of science, we are able to support a *modular* approach to expertise.

Recognition that there is no proper model or universal ingredient applicable to all the activities that might be described as *science* (let alone expertise) provides judges with opportunities and simultaneously obligations to develop adjectival law in more socially responsible and epistemologically legitimate ways. Judges can, for example, develop models of expertise that are tailored to and embody legal values and principles and take into account experience with wrongful convictions and a broad-based critique of forensic science and medicine.<sup>109</sup>

These ideas have subsequently been developed in other writings. While it would be unfair to expect Acharya to be conversant with recent publications, the sentiments expressed in them are consistent with those advanced in our original article.<sup>110</sup> In this explanatory context they bear repeating:

...legal models of expertise should be shaped primarily by legal principle and system goals. That is, they should be more modular, indexed to: the participants; the type of proceeding; the type of expertise; the broader socio-political purposes of different types of institutions and activities, as well as what we actually *know* about technical capabilities.

Once we recognize that expertise can be described in a variety of non-essential ways we can begin to reflect upon attributes that might be considered desirable in particular legal contexts. That is, we can begin to think about tailoring models of expertise and admissibility criteria to achieve or uphold specific socio-legal values and objectives. By way of example, the model of expertise governing admissibility and proof might be quite different in a system that values crime control over accuracy and/or fairness. Similar considerations arise in the civil sphere when we factor in the resources of the parties and a range of regulatory aspirations associated with risk, deterrence and compensation.

109. Edmond & Roach, *supra* note 1 at 404.

110. Gary Edmond, "Advice for the Courts? *Sufficiently Reliable* Assistance with Forensic Science and Medicine (Part 2)" (2012) 16 International Journal of Evidence & Proof 263 [Edmond, "Advice for the Courts?"].

A demanding model of expertise—one, for example, that inflexibly incorporates most (or all) of the *Daubert* criteria or their proposed English 'equivalents' might be desirable when determining the admissibility and weight of a type of incriminating expert opinion evidence that is routinely adduced by the state. Forensic science techniques, particularly those used routinely, should be able to satisfy quite onerous admissibility criteria. Not because these criteria embody authentic (or proper or good or real and so on) science or its essential attributes, or even *reliability* for all times and places, but rather because legal values, the epistemic weakness of many forensic sciences, and emerging evidence about the frailty of the adversarial trial, all suggest that unreliable expert evidence subverts criminal trial principles and objectives. In the context of criminal justice, imposing (and enforcing) reliability-based admissibility standards fulfills a pragmatic function more consistent with the premium placed on factual rectitude and the practical difficulty of overcoming incriminating, but unreliable, expert opinion evidence.

Onerous admissibility criteria might be less well suited to civil proceedings and regulatory settings. Where, for example, an impecunious plaintiff alleges that a pharmaceutical caused a debilitating injury, it might be inappropriate to burden that individual (or 'group') with proof if the drug has not been adequately tested, or only tested by private research organizations engaged by the manufacturer through clinical trials designed to facilitate regulatory approval. Strictly applying *Daubert*-style reliability criteria and privileging pre-litigation research, for example, makes it difficult for plaintiffs to prove injury and loss. It might also undermine civil justice and regulatory objectives such as deterring potentially dangerous activities and products as well as provide manufacturers with incentives not to sponsor independent safety and efficacy studies. Simultaneously, it transfers the risks of uncertainty, inaction, under-compensation and malfeasance from manufacturers (and employers) to a range of other publics. By accepting uncritically the nature of *science*, or treating definitions of expertise as effectively neutral, many of these important (and contested) issues from our civil, criminal and regulatory systems risk elision or displacement.<sup>111</sup>

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111. Extracted from Edmond, "Advice for the Courts?," *ibid* at 294-295. Compare Peter Huber, *Galileo's Revenge: Judging Science in the Courtroom* (New York: Basic Books, 1993) Kenneth R Foster & Peter W Huber, *Judging Science: Scientific Knowledge and the Federal Courts* (Cambridge, MA: MIT Press, 1999) in W Wagner & R Steinzor, eds, *Rescuing Science from Politics: Regulation and the Distortion of Scientific Research* (Cambridge: Cambridge University Press, 2006); C Cranor, *Toxic Torts: Science, Law and the Possibility of Justice* (CUP, Cambridge 2006); L Finley, "Guarding the gate to the courthouse: How trial judges are using their evidentiary screening role to remake tort causation rules" (1999) 49 DePaul L Rev 335.

Sensitive to espoused legal values and principles, we deliberately distinguished civil and criminal justice systems.<sup>112</sup> Of interest, it may be that the actual goals and principles pertaining to criminal justice are more readily identified and less controversial, at least in the abstract, than the goals, values and purposes underpinning the many and varied realms of civil justice.<sup>113</sup>

### VII. *Empirical evidence?*

One conspicuous difference between our respective approaches, and presumably that enables Acharya to defend the status quo, concerns our respective responses to empirical evidence. Although she does not discuss it, Acharya seems wedded to judicially-driven reform—perhaps part of the legal method—as part of the system’s legitimacy and ability to remain imperviousness to exogenous facts. We, in marked contrast, are interested in evidence and perspectives that can inform our understanding of legal performance in both individual cases (e.g., Innocence Projects) or more systemically (e.g., the Goudge Inquiry and the Law Commission). We are also interested in what peak scientific bodies or independent committees have to say about forensic science and medicine evidence used by courts (e.g., the NAS report).

This is not the place to reproduce our evidence, but rather an opportunity to affirm the need to attend to sustained evidence and authoritative criticism of legal practice. In this context it is instructive to make a point in relation to fingerprint evidence that reinforces problems with contemporary legal practice as well as Acharya’s defence of it. The example illustrates how legal legitimacy is likely to be eroded, to the extent that judges and expert witnesses disregard the consensual advice of leading commentators and peak scientific organizations.

In the aftermath of the NAS report there have been two prominent inquiries into the use of fingerprints for purposes of identification. The first, an investigation conducted by Lord Campbell—*The Fingerprint Inquiry*—into problems with latent fingerprint evidence in Scotland following the notorious McKie case, and the second by the Expert Working Group on Human Factors in Latent Print Analysis (EWGHF)—a large multidisciplinary collective sponsored by the United States National Institute of Standards and Technology (NIST) and the National Institute

112. Edmond’s earlier work on tort and product liability was critical of the *Daubert* criteria as an accurate (and adequate) description of science. Individually, and with David Mercer, he argued that the *Daubert* criteria tended to be onerous and were not necessarily well suited to legal practice, especially admissibility decision-making in tort and product liability litigation.

113. See also Gary Edmond & Mehera San Roque, “Just(,) quick and cheap” in M Legg, ed, *The Future of Dispute Resolution* (Sydney: LexisNexis Butterworths, 2013) at 72-83.

of Justice (NIJ).<sup>114</sup> Simultaneously, *the first ever* validation studies of fingerprint expertise were undertaken.<sup>115</sup> Fortunately, the validation studies affirmed that fingerprint examiners had formidable abilities at matching and discriminating between fragmentary and reference prints when their performance was compared to lay persons. This might, by way of understatement, be considered to be something of a relief for both the examiners and the many legal systems that have confidently relied on opinions about fingerprints as identification evidence for more than a century.<sup>116</sup> However, the validation studies and reports, recognized that the performance of highly trained and experienced examiners *was not error free*. The validation studies suggest that rates of error are not trivial and the two reports both recommend that fingerprint examiners should abandon equating a declared match with positive identification—so-called individualization. Two, of the considerable number of recommendations flowing from the reports, include the following:

**Recommendation 3:** 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.<sup>117</sup>

**Recommendation 3.7:** Because empirical evidence and statistical reasoning do not support a source attribution to the exclusion of all other individuals in the world, latent print examiners should not report or testify, directly or by implication, to a source attribution to the exclusion of all others in the world.<sup>118</sup>

This example is interesting because it affirms that even basically reliable techniques, such as the ability to match and discriminate between prints and partial prints, are routinely being misrepresented in courts. Some examiners, according to these recent reports, continue to testify in absolute terms, continue to trivialize the risk of error, and improperly leap from a match to identification. Revealingly, limitations with fingerprint evidence were not identified by the courts and were not unilaterally

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114. Expert Working Group on Human Factors in Latent Print Analysis, *Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach* (US Department of Commerce, National Institute of Standards and Technology, 2012) [EWGHF, *Latent print examination and human factors*]; Campbell, *The Fingerprint Inquiry*, *supra* note 2.

115. J Tangen, M Thompson & D McCarthy, "Identifying fingerprint expertise" (2011) 22 *Psych Sci* 995; B Ulery et al, "Accuracy and reliability of forensic latent fingerprint decisions" (2011) 108 *PNAS* 7733.

116. It also suggests that the use of empirical evidence, consistent with demonstrable reliability, will not necessarily lead to wholesale exclusion or open the floodgates to so-called "wrongful acquittals." It may actually be consistent with high conviction rates.

117. Campbell, *The Fingerprint Inquiry*, *supra* note 2 at 37.

118. EWGHF, *Latent print examination and human factors*, *supra* note 114 at 207-210.

conceded by fingerprint examiners. This example suggests that current legal practices, and perhaps even more onerous admissibility standards, may not pay sufficient attention to actual evidence of reliability and will tend to reinforce the status quo, even where longstanding practice has many serious, if unappreciated, problems. Significantly, there are good reasons to believe that fingerprint comparison evidence is much more reliable than other kinds of comparisons involving: teeth and bite marks; persons in images; voices and sounds; shoe and foot prints; gait; hair; ballistics, tool marks; handwriting and documents; blood spatter and so on. Rigorously applied, *demonstrable reliability* has the benefit of requiring those proffering opinions to provide evidence that techniques are reliable. Such evidence would often have the additional advantage of providing an indication of the error rate thereby informing the way expert opinions are expressed and evaluated.

It is our contention that lawyers and judges cannot simply ignore the NAS report or similar reports emerging in its wake. We must understand the legal use of incriminating expert opinion evidence in terms of what scientists (including psychologists) tell us about the value of the evidence, appropriate forms of expression and the ability of lay persons to credibly evaluate it. Legal practice, to the extent that it is concerned with accuracy, fairness and legitimacy cannot afford to disregard these insights and cannot disregard the critical interventions of peak scientific organizations.

#### VIII. *Reforming a “procedurally legitimate” system*

Acharya contemplates and indeed appears to accept the possibility of reform in ways that are consistent with “procedural legitimacy.” For example, she suggests that:

...the utility of the adversarial process should be appreciated and enhanced rather than altered with a view to better accommodate science. The enhancement can be facilitated by: providing experts with codes of conduct clarifying that their role is to assist the court, not to advocate for a party; providing juries with charges that assist them in preventing over-deference to distinguished experts and over reliance on scientific constructs; ensuring that disclosure principles are complied with so that cross-examination occurs as informed as possible; increased education of all legal players.<sup>119</sup>

These examples represent an attempt to refine existing practices. For Acharya, these “enhancements to the existing adversarial procedure are all likely to improve the legal system’s ability to understand and

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119. Acharya, *supra* note 1 at 44.

use science."<sup>120</sup> In reality, most are already in place across the common law world. Experts, by way of example, always knew they had a formal obligation to be truthful, juries in most common law jurisdictions obtain some kind of directions or warnings about expert evidence, and cross-examination is universally available. These refinements have not exerted a discernible influence on the quality of forensic science and medicine or the ability of the criminal justice system to process it.<sup>121</sup>

Acharya goes beyond this conventional response to suggest that "better protection of the accused could be achieved by advocating for an increase in the standard of proof required to convict an accused person."<sup>122</sup> Although original, this proposal seems unlikely for a variety of theoretical and practical reasons. The standard "beyond reasonable doubt" is already so onerous, at least theoretically, that there is really nowhere to go. It is, however, consistent with Acharya's confidence in the ability of the burden of proof to regulate the assessment of evidence.

We doubt whether any of the proposed reforms, including Justice Goudge's admissibility proposal and even our demonstrable reliability standard, will dramatically change legal practice without attendant changes to legal culture(s).<sup>123</sup> Nevertheless, there are deeper, structural problems with Acharya's approach to legal reform. We are not sure why some changes and recommendations appear to be procedurally legitimate and others, including our own, seem to be illegitimate.

Acharya accepts the Supreme Court's recent jurisprudence and goes even further, suggesting that Justice Goudge's recommendation, especially with respect to better funding of the defence, enhance "procedural legitimacy."<sup>124</sup>

Thus, rather than compromising the pre-existing admissibility rules, Goudge J.'s recommendations serve to enhance the application of these rules.<sup>125</sup>

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120. *Ibid.*

121. Gary Edmond, S Cole, Emma Cunliffe & Andrew Roberts, "Admissibility compared: The reception of incriminating expert opinion (i.e., forensic science) evidence in four adversarial jurisdictions" (2013) *U Denv Crim L Rev* (forthcoming).

122. Acharya, *supra* note 1 at 27-28.

123. In New South Wales there seems to be a slow change in judicial thinking and practice, though with limited reform to the actual admissibility standards themselves. See, e.g., *Morgan v The Queen*, [2011] NSWCCA 257; *Wood v The Queen*, [2012] NSWCCA 21; *Gilham v The Queen*, [2012] NSWCCA 131.

124. Acharya, *supra* note 1 at 30.

125. *Ibid* at 30.



In the end, support for Justice Goudge's recommendations flows from Acharya's "*impression...that it presents a balanced and principled assessment of the science and law interaction.*"<sup>126</sup>

Acharya's support for the Goudge recommendations and rejection of our position and its purportedly deleterious system implications is all the more curious when their respective implications are actually considered. In practice, the differences between the Goudge recommendations and our own proposal are, as explained in Part V, relatively minor. The major practical difference would be that in some modest proportion of cases the tribunal of fact will have to assess incriminating expert opinion evidence that would have been excluded on our proposal. Moreover, in a large proportion of these cases, it will be a trial judge making decisions about admissibility and weight.<sup>127</sup> In practice, the difference would only manifest in cases where the expert opinion meets "threshold reliability" but does not satisfy the "demonstrably reliable" standard.<sup>128</sup> That is, the judge or jury would no longer be expected to assess expert opinions of unproven or unknown reliability under our proposals. Only opinions that had some credible grounding could inform determinations of guilt. This, we contend, is not especially radical—legally or epistemologically. Certainly, it is not as radical as raising the standard of proof.

Acharya promotes an idealized (or essentialist) approach to law and legal practice. Conventional legal processes, subject to some types of reform driven by judges, seem to be reified. We in contrast, reject the contention that changes to legal practice that are driven by principle and evidence about their effects, and possibly other factors such as cost, *necessarily* distort, compromise or undermine institutional legitimacy. We are, though, concerned with the performance of the system and outcomes rather than "enhanc[ing] the application of...rules."

Acharya has not provided a mechanism for reform, nor identified system values that would provide some justification for modifying procedures, nor a framework for evaluating change. In such circumstances we are left to wonder how "procedural legitimacy" can be maintained if the procedures are changed or even refined? On what basis are Justice Goudge's

126. *Ibid* at 4 [emphasis added].

127. This itself seems to be a problem, though one beyond the scope of this essay. See generally, A Wistrich, C Guthrie & J Rachlinski, "Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding" (2005) 153 U Pa L Rev 1251.

128. We were also concerned about the large volume of charges that are processed beyond the court and the public gaze. Acharya's essay, and the championing of procedural legitimacy, offers little assistance in relation to the use of unreliable and speculative opinions to induce guilty pleas. By requiring the state to actually evaluate and, if necessary, refine forensic science and medicine techniques and the expression of opinions, we hope to exert some, albeit weak, influence on practices beyond the courtroom.

recommendations acceptable and why do they not compromise procedural legitimacy? Why should judges take notice of the recommendations following the Goudge Inquiry but not those of the NAS or other bodies that have criticized the state of current forensic science and medicine? Similarly, why was *Mohan* acceptable and why does it bear an importance in her analysis that subsequent cases such as *JLJ* or *Trochym* do not? More to the point, if the Supreme Court subsequently adopted a *demonstrable reliability* standard would that be improper? And, extending this out, is Acharya's analysis limited to Canada? We wonder whether *Daubert* is procedurally legitimate? Alternatively, are systems that resist some kind of reliability threshold—such as Australian jurisdictions, England and Wales—procedurally illegitimate? In our view, Acharya has yet to provide a yardstick to determine when a particular change is (il)legitimate or what might count as a just measure of science.<sup>129</sup>

### Conclusion

Certainly, it is desirable to avoid legal decisions that are blatantly contrary to scientific knowledge.<sup>130</sup>

In ACA we were careful to place emphasis on the need for any revised admissibility standard to be *reflexive*—that is informed by the emerging evidence about wrongful convictions, recent and authoritative criticisms of the forensic sciences (e.g., NAS report), and empirical evidence about the performance of trial safeguards (e.g., Law Commission of England and Wales) and legal personnel.<sup>131</sup> In consequence, reform requires shifts in beliefs and commitments (some longstanding)—from lawyers and judges—and probably more dramatic changes to actual practice. Theoretically oriented commitments, in combination with insensitivity to critical discussions beyond the courts, are unlikely to lead lawyers and judges to improve their practices.

Given our emphasis on the need to consider developments beyond the law, it is useful to conclude this response with the recent reflections of two eminent judges. The first, Judge Harry T. Edwards, Senior Circuit Judge and Chief Judge Emeritus for the United States Court of Appeals for the D.C. Circuit, was one of the two chairs for the NAS inquiry and report. Before the NAS inquiry, Judge Edwards seems to have been confident about the state's forensic science and medicine as well as the performance

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129. D Nelken, "A Just Measure of Science" in M Freeman & H Reece, eds, *Science in Court* (Aldershot, UK: Dartmouth, 1998).

130. Acharya, *supra* note 1 at 2.

131. Edmond & Roach, *supra* note 1 at 397.

of trial and appellate courts. Of the following extracts, the first is taken from the NAS report and the other two from an essay written shortly after its release.

The report finds that the existing legal regime—including the rules governing the admissibility of forensic evidence, the applicable standards governing appellate review of trial court decisions, the limitations of the adversary process, and judges and lawyers who often lack the scientific expertise necessary to comprehend and evaluate forensic evidence—is inadequate to the task of curing the documented ills of the forensic science disciplines.<sup>132</sup>

I started this project with no preconceived views about the forensic science community. Rather, I simply assumed, as I suspect many of my judicial colleagues do, that forensic science disciplines typically are well-grounded in scientific methodology and that crime laboratories and forensic science practitioners follow proven practices that ensure the validity and reliability of forensic evidence offered in court. I was surprisingly mistaken...<sup>133</sup>

*Unfortunately*, the adversarial approach to the submission of evidence in court is not well suited to the task of finding “scientific truth.” The judicial system is encumbered by, among other things, judges, lawyers, and jurors who generally lack the scientific expertise necessary to comprehend and evaluate forensic evidence in an informed manner; defense attorneys who often do not have the resources to challenge prosecutors’ forensic experts; trial judges (sitting alone) who must decide evidentiary issues without the benefit of judicial colleagues and often with little time for extensive research and reflection; and very limited appellate review of trial court rulings admitting disputed forensic evidence. Furthermore, the judicial system embodies a case-by-case adjudicatory approach that is not well suited to address the systematic problems in many of the various forensic science disciplines.<sup>134</sup>

The second judge, Justice Ian Binnie, has written about the need to reform the rules concerning expert opinion evidence, contending that:

[t]he *theory* has always been that a trial of fiercely contending positions will ultimately reveal the truth, a theory not unlike Adam Smith’s vision of the Invisible Hand, which guides its warring participants towards production of the optimum result. In courtrooms, as well as in the investment banking business, the thought has belatedly occurred to people that the Invisible Hand has its limitations as a control mechanism.<sup>135</sup>

132. NAS report, *supra* note 2 at 85.

133. Harry T Edwards, “Solving the Problems That Plague the Forensic Science Community” (2009) 50 *Jurimetrics* J 5 at 8. See also HT Edwards, “The National Academy of Sciences Report on Forensic Sciences: What It Means for the Bench and Bar” (2010) 51 *Jurimetrics* J 1.

134. *Ibid* at 19 [emphasis added].

135. Justice Ian Binnie, “The Changing Role of the Expert Witness” (2010) 49 *Sup Ct L Rev* (2d) at 179-180.

He concludes that: "[t]he public is rightly shocked by the scandal of demonstrated miscarriages of justice based on flawed expert testimony as disclosed by the Goudge Inquiry into Dr. Charles Smith, and the Kaufman inquiry into the wrongful conviction of Guy Paul Morin. The Courts ignore public shock at their peril," he observes, adding that "[i]t seems evident that if the Courts are to continue to offer themselves as a credible source of dispute resolution, the traditional rather amateurish way of receiving and assessing expert evidence will have to be modified and improved."<sup>136</sup>

The time for appeals to legitimacy through the application of conventional legal procedure is over. Legal institutions need to come to terms with their complicity in the use and legitimation of many forms of forensic science and medical practices that have proven not to be reliable in a considerable number of cases. Even when procedurally regular, the wrongful convictions revealed in these cases have eroded the legitimacy of criminal justice systems throughout the world and engendered demands for reforms, including reforms to the rules governing the admissibility of expert opinion evidence. The challenge for the future concerns the terms on which legal and regulatory institutions develop procedures to engage with scientists and scientific knowledge and begin to evaluate their own performances. These are the only hopes for legal institutions interested in retaining autonomy, improving practices relative to espoused goals, and enhancing their social legitimacy.

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136. *Ibid* at 191, 186.

