

# *Procedural Fairness, the Criminal Trial and Forensic Science and Medicine*

Gary Edmond\* and Andrew Roberts†

---

## *Abstract*

In early 2009 the National Research Council (NRC) of the US National Academy of Sciences published a report that was highly critical of many established areas of forensic science and the role of criminal courts in regulating them. In the same year, the Law Commission of England and Wales released a Consultation Paper, proposing that England and Wales should effectively embrace the approach to expertise associated with *Daubert*, guiding the US Federal Courts and many state courts (though criticised by the NRC). In 2011 the Law Commission formally recommended a reliability standard in a draft bill. In Australia, courts and reformers have done little in response to problems of reliability and the serious criticisms identified by the NRC have been muted. This essay aims to explain how notions of rectitude, practical authority, fair trial rights, and so called fundamental principles of evidence law (eg the presumption of innocence, the right to examine witnesses, the allocation of burdens and standards of proof, the premium placed on liberty and not convicting the innocent) can help us to reconsider legal approaches to the admission and use of expert evidence in adversarial criminal proceedings in response to emerging and institutionally unsettling empirical evidence.

## **I Introduction**

Criminal trials, in the adversarial tradition, are concerned with truth (or rectitude) and justice. They aim, so the dominant rationalisations suggest, to identify the fact(s) of the matter according to law. Consequently, the rules and procedures that regulate the conduct of

---

\* Professor, School of Law and Director, Expertise, Evidence & Law Program, The University of New South Wales. This research was supported by the Australian Research Council (DP0771770 and FT0992041). Thanks to Andrew Ligertwood, David Hamer, Hock Lai Ho, Larry Laudan, Kent Roach and Mehera San Roque for their comments.

† Senior Lecturer, School of Law, University of Melbourne.

criminal trials serve two broad ends. They ought to ensure, as far as is possible, that trials (and, to some extent, the preceding investigation along with any plea negotiations) lead to accurate outcomes, and that they are conducted in a manner that is consistent with fundamental principles of fairness and justice. These objectives substantially overlap, in the sense that rules and procedures that conform to the demands of procedural fairness will often — though perhaps not always — yield more accurate outcomes. Images of fairness are often embedded in the procedural guarantees and rights provided by constitutions and rights documents. The content of these rights and guarantees are derived from more general moral and political ideas about the function of the criminal trial and the state's obligations in respect of those it accuses of wrongdoing. We contend that the rules and procedures regulating the course of the criminal trial should be shaped not only by these, occasionally abstract, principles and values, but also by the inevitable practical constraints and deficiencies of the fact-finding process. A serious commitment to the idea of a fair trial requires us to develop rules and procedures that accommodate empirical revelations concerning the tendencies and capacities of the actors involved in the trial process.<sup>1</sup>

This article focuses on the admissibility and use of incriminating expert opinion evidence at trial.<sup>2</sup> The law regulating the reception of this form of evidence is the subject of ongoing concern and controversy. There seem to be problems with the foundations of many, perhaps most, of the modern forensic sciences and much forensic medicine. A committee of the National Research Council (NRC) of the US National Academy of Sciences, for example, recently expressed doubt about the 'knowledge base' underpinning many areas of forensic science.<sup>3</sup> In doing so, the NRC Report, perhaps unwittingly, exposed

---

<sup>1</sup> Elsewhere this has been described as a reflexive or contextual approach; see Gary Edmond and Kent Roach, 'A Contextual Approach to the Admissibility of the State's Forensic Science and Medical Evidence' (2011) 61 *University of Toronto Law Journal* 343.

<sup>2</sup> We use the terms 'expert evidence' and 'expert opinion evidence' interchangeably because in practice, the division between expert evidence and expert opinion evidence is often not particularly clear and even experts purporting to provide factual evidence are almost invariably providing evidence of opinion.

<sup>3</sup> Committee on Identifying the Needs of the Forensic Science Community, National Research Council of the National Academies (NRC), *Strengthening the Forensic Sciences in the US: A Path Forward* (The National Academies Press, 2009) 5, 7: 'With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source... . The law's greatest dilemma in its heavy reliance on forensic evidence, however, concerns the question of whether — and to what extent — there is science in any given forensic science discipline.' See also Michael J Saks and David L Faigman, 'Failed Forensics: How Forensic Science Lost Its Way and How It Might Yet Find It' (2008) 4 *Annual Review of Law and Social Science*, 149; Michael J Saks and Jonathan J Koehler, 'The Coming Paradigm Shift in Forensic Identification

the parlous condition of much forensic science and medicine evidence across *all* jurisdictions.<sup>4</sup> In this essay, in response to ongoing problems and the emergence of largely unanticipated, though authoritative, critiques of forensic science, forensic medicine and legal practice, we consider the normative question: ‘How should principles of criminal justice and evidence law shape the reception of incriminating expert opinion evidence?’ Courts have exhibited a very conspicuous tendency to admit incriminating expert opinion evidence and leave questions about its probative value (or weight) for the tribunal of fact. This approach, we suggest, sits awkwardly with some of the fundamental principles that are constitutive of both a fair trial and an accurate outcome, and is difficult to reconcile with the findings of empirical studies and recent experience of wrongful convictions.

As things stand, considerable, and largely unwarranted, faith seems to be placed in the efficacy of legal rules and procedures — often characterised as mechanisms assisting the search for truth — and safeguards that are presumed to address effectively the risk of wrongful conviction. Lawyers and trial judges, and consequently appellate judges, seem generally indifferent to the practical limitations of admissibility rules, trial safeguards and a range of problems peculiar to incriminating expert opinion.<sup>5</sup> Indifference to (or disinterest in) the shortcomings of the procedural arrangements governing the reception and evaluation of expert evidence among those officials responsible for administering the criminal process ought to be a matter of concern.

In what follows, we develop some thoughts about how principles underpinning evidence law and the idea of a fair trial (including proliferating rights discourses), might require us to reconsider the ways our courts approach incriminating expert evidence.<sup>6</sup> We are primarily interested in the admissibility and, to a lesser extent, presentation and assessment of expert evidence in criminal proceedings. Our discussion involves drawing attention to the

---

Science’ (2005) 309 *Science*, 892–5; Erica Beecher-Monas, *Evaluating Scientific Evidence: An Interdisciplinary Framework for Intellectual Due Process* (Cambridge University Press, 2007).

<sup>4</sup> Obviously there are exceptions, but many areas of forensic science and medicine appear to lack a knowledge base and research culture. The apparent absence of (or inability to identify) underlying research in one jurisdiction will almost always mean there is no relevant research in any jurisdiction.

<sup>5</sup> These issues are discussed below. One interesting insight pertains to concerns about the influence of popular television programs (such as *CSI*). Bizarrely, legal actors seem to be more likely to speculate about, and frequently decry, the *potential* influence of *CSI* than worry about the practical and substantial operation of actual procedures and protections. Compare Simon A Cole and Rachel Dioso-Villa, ‘Investigating the “*CSI* Effect”: Media and Litigation Crisis in Criminal Law’ (2009) 61 *Stanford Law Review* 1335.

<sup>6</sup> Rights discourses have tended to be relatively ineffective in relation to the treatment of incriminating expert evidence. They tend to focus on fairness in abstract ways that privilege legal tradition.

inconsistent operation, and frequent failure, of many of the procedures and safeguards routinely invoked to support (or perhaps rationalise) the admission of incriminating expert opinion that is either unreliable or of unknown reliability. The weakness of so-called safeguards makes admissibility practice of fundamental importance to both fairness and rectitude.<sup>7</sup>

It is our contention that the state has a duty to take all reasonable steps to ensure that the outcome of a criminal trial is factually accurate and that the trial is conducted in a way that is, as far as reasonably possible, substantially fair. As we explain, this requires that particular attention be focused on the quality and trustworthiness of expert evidence adduced and relied upon against persons accused of wrongdoing. Existing approaches are difficult to reconcile with these obligations. Vindication of the procedural rights of the accused requires courts (or legislatures) to adopt effective procedures that lead to the exclusion of incriminating techniques and opinions that are not *demonstrably reliable*.<sup>8</sup> It may, as we suggest later, be necessary to rethink some of the institutional arrangements regulating the admission and assessment of incriminating expert opinion.

## II Rectitude and the Right to Procedural Accuracy

Central to almost all normative accounts of the criminal trial is the idea that its primary function is to establish the truth of the matters that gave rise to the allegations of wrongdoing. Within the rationalist tradition, pursuit of this end — characterised by Bentham as *rectitude* — is the principal purpose of the body of rules and procedures that govern the reception and presentation of evidence. Of course, the law of evidence also serves non-epistemic objectives. Concern for the dignity of those accused of crime might lead to the adoption of rules and procedures that are occasionally sub-optimal in respect of inquiries into truth. Similarly, concern with fairness (particularly to the accused) might also define what evidence is admitted and how it is used. Nevertheless, it is widely accepted, even among those who argue that notions of fairness and justice ought to be given special

---

<sup>7</sup> Our analysis is primarily conceptual and, consequently, we have drawn quite eclectically from a range of relevant common law jurisdictions. Without wanting to trivialise jurisdictional differences, common law courts (and many courts in civil traditions) tend to be broadly consistent in their willingness to admit forensic science and medicine evidence at trial, and even in their treatment of such evidence in the trial and on appeal.

<sup>8</sup> On ‘demonstrable reliability’, see Gary Edmond, ‘Pathological Science? Demonstrable Reliability and Expert Pathology Evidence’ in Roach (ed), *Pediatric Forensic Pathology and the Justice System* (Queen’s Printer for Ontario, 2008), 96–149.

weight in determining the contours of the criminal trial, that the pursuit of truth must be the foundation of a rational criminal justice process.<sup>9</sup> With this we concur.

Our concern is with incriminating expert opinion, and the question of how to use this potentially valuable evidence in ways that are both conducive to rectitude and substantially fair. The premise for much of what we want to say flows from what Dworkin refers to as the profound moral right that innocent defendants have against conviction for crimes of which they are wrongly accused.<sup>10</sup> If we accept that those accused of crime have such a right, then it must follow that *all* defendants have a right to the most accurate procedures for establishing guilt and non-guilt. The substantive right that innocent defendants have to a particular outcome — namely acquittal — is contingent on the right to procedures that provide the best means of securing that outcome. We characterise this as an entitlement (or right) to *procedural accuracy*. We recognise, of course, that criminal justice systems operate on limited resources and the state may not be able to discharge its duty to provide the most accurate means of establishing the innocence or guilt of those it accuses of wrongdoing. As Galligan explains, however, this should not lead to the conclusion that the right to procedural accuracy is qualified, but rather in some circumstances the state might be excused for failing to discharge this duty on grounds that it has insufficient resources or what is asked is beyond current abilities.<sup>11</sup>

Nevertheless, it seems to us that the notion of a fair trial must encompass some form of consequentialist calculus. A process might be thought of as fair or just if it leads in some sense to the best consequences. What counts as the ‘best consequences’ depends on the particular context in which the question is asked (and by whom). For us, the question relates primarily to ensuring that the innocent are not wrongly convicted. Where the state or its agents have a range of procedural options and the available resources are such that any of these could be adopted, justice requires adoption of the procedure that

---

<sup>9</sup> Hock Lai Ho, *A Philosophy of Evidence Law: Justice in the Search for Truth* (Oxford University Press, 2008); Alex Stein, *Foundations of Evidence Law* (Oxford University Press, 2005); William Twining, *Rethinking Evidence: Exploratory Essays* (Blackwell, 1990). This principle has been given high judicial endorsement, see, eg, *Funk v United States*, 290 US 371, 380 (1933); *Tehan v United States* 382 US 406, 416 (1966); *R v Nikolovski* [1996] 3 SCR 1197, 1206.

<sup>10</sup> Ronald Dworkin, *A Matter of Principle* (OUP, 1985), 72.

<sup>11</sup> Denis J Galligan, *Due Process and Fair Procedures: A Study of Administrative Procedures* (Clarendon, 1996), 112–22. See also, *Patterson v New York* 432 US 197, 208 (1977): ‘Due process does not require that every conceivable step be taken, at whatever cost, to eliminate the possibility of convicting an innocent person.’ However, this is not an excuse for failing to undertake ‘do-able’ research. See Joan H Fujimura, ‘Constructing “Do-able” Problems in Cancer Research: Articulating Alignment’ (1987) 17 *Social Studies of Science* 257.

there are good grounds to believe will generally produce the most accurate outcomes. It ought to be acknowledged that the criminal trial is an imperfect procedure, and that a fair trial might result in a miscarriage of justice. The difficulty of reconstructing past events means that fact-finders will inevitably have to deal with epistemic uncertainty, and this uncertainty is attended by the risk of error.<sup>12</sup> The aspect of procedural fairness with which we are concerned does not require the risk of error to be eliminated for there can be no duty to achieve the impossible. Rather, it requires that the state and its agents strive to mitigate such risks.

While the general right to procedural accuracy is entirely consistent with the rationalist goal of rectitude, it provides this enterprise with a moral foundation: a justification for the imposition of duties on the state that is grounded in respect for the dignity of the accused and the socio-political desirability of a fair process. The general right to procedural accuracy provides a broad foundation for evidentiary principles and a range of more specific procedural rights — such as the right to produce witnesses and cross-examine witnesses called by other parties; the best evidence principle; relative equality of arms; and the right of disclosure — that further a defendant's interests in securing an accurate outcome.<sup>13</sup> While the general right to procedural accuracy provides the justification for various specific rights, it is also residual, so that where the scope of particular rights is exhausted, the state's duty to provide the procedure most conducive to accurate outcomes remains in place. Implications for the law regulating the reception and use of incriminating expert evidence may well flow from various specific rights, but an inquiry that is narrowly focused on these rights may not reveal the systemic problems that are of particular interest here. The question to which we turn initially, therefore, is whether — in view of the forensic shortcomings of the criminal trial with respect to expert evidence — the goal of rectitude is served by the doctrine of free proof (resulting in a very accommodating approach to incriminating expert evidence), and concomitantly whether a commitment to this kind of approach is consistent with the right to procedural accuracy.

---

<sup>12</sup> Emma Cunliffe, *Murder, Medicine and Motherhood* (Hart Publishing, 2011).

<sup>13</sup> (In)equality of arms is rarely addressed but should not be ignored. Ordinarily, empirical support for reliability of expert evidence is within the scope or ability of the state and its considerable resources. Consider *Blatch v Archer* (1774) 98 ER 969, 971.

*A Free Proof and the Forensic  
Limitations of the Criminal  
Trial*

The idea of *free proof*, described in broad terms by Twining as ‘an absence of formal rules that interfere with free inquiry and natural or commonsense reasoning’ has been promoted by a range of commentators and practitioners.<sup>14</sup> Laudan, one of the leading contemporary proponents, suggests that ‘[t]he only factor that should determine the admissibility or inadmissibility of a bit of evidence is its relevance to the hypothesis that a crime occurred and the defendant committed it.’<sup>15</sup>

To be admissible, incriminating expert opinion evidence must be relevant. This means it must have the ability to influence the assessment of facts in issue in some logical way. In many jurisdictions the relevance of expert evidence tends to be taken for granted, on the basis that the evidence may be relevant if the fact-finder *accepts* it.<sup>16</sup> While this might be a comprehensible response to many forms of evidence, such as lay testimonial accounts that depend on the credibility imputed to the witness, it does not make much sense as a response to incriminating expert opinion.<sup>17</sup> Lawyers and judges routinely take the relevance of expert opinion for granted (or on trust), even though it would be possible to assess the validity of most forms of expert evidence, along with the proficiency of analysts, to ascertain whether the evidence, in fact, has probative value and is relevant. Notwithstanding the tendency to allow well-credentialed and/or experienced individuals to express their opinions at trial, if expert witnesses cannot actually do what is claimed, or the likelihood of them being able to do this is little better than chance, then their incriminating opinion is not logically relevant and they should not be allowed to express it. It is a mistake, and this point relates to our subsequent

---

<sup>14</sup> Twining, above n 9, 195, 232.

<sup>15</sup> Larry Laudan, *Truth, Error, and Criminal Law: An Essay in Legal Epistemology* (Cambridge University Press, 2006), 2. Laudan considers rectitude to be more important than and separate from fairness, thus recognising that reliability may have a role to play in admissibility determinations.

<sup>16</sup> *Evidence Act 1995* (Cth): ss 55–56. See, eg, *R v Shamouil* (2006) NSWLR 228; Tim Smith and Stephen Odgers, ‘Determining “Probative Value” for the Purposes of Section 137 in the Uniform Evidence Law’ (2010) 34 *Criminal Law Journal*, 292. For cases belying the seeming simplicity of ‘relevance’ see *Smith v The Queen* (2001) 206 CLR 650, [56]; *Evans v The Queen* (2007) 235 CLR 521; *Bain v The Queen* [2009] NZSC 16.

<sup>17</sup> In terms of admissibility the demeanour and confidence of the expert witness is trivial. See *Wiki v Atlantis Relocations (NSW) Pty Ltd* (2004) 60 NSWLR 127, 136–8, [60]–[68] (Ipp J).

discussion of admissibility standards, to assume that merely because a person has qualifications or experience, or purports to use a widely accepted technique, their opinion has probative value.<sup>18</sup>

Predicated upon logical relevance, the concept of free proof possesses a superficial attraction. The idea that providing the tribunal of fact with all relevant evidence that the parties are able (or willing) to muster will lead to more accurate adjudication has intuitive appeal. However, there may be good reasons to withhold even relevant evidence from the tribunal of fact in a criminal trial.<sup>19</sup> The intuitive appeal of free proof relies on various assumptions regarding the effectiveness of the traditional means of testing evidence, and the ability of fact-finders to comprehend and use it responsibly. Proponents of free proof tend to overlook the frailties of legal practice, the asymmetrical distribution of resources (and some types of expert) as well as the way that evidence might be assembled synergistically and rhetorically to support a case that appears more persuasive than it actually is. Empirical evidence suggests that the adversarial trial and its various safeguards are not always well positioned to explore incriminating expert opinion and reliability problems. There are good grounds for doubting whether traditional means of testing the veracity of such testimony, along with judicial warnings and instructions, intended to ensure that juries engage in rational deliberation, are consistently effective.

## ***B Cross-Examination and Judicial***

### ***Directions***

A defendant's right to examine witnesses is inherently and instrumentally valuable.<sup>20</sup> In respect of the former, it facilitates his or her participation in the trial and demonstrates respect for his or her autonomy. There can be no doubt that in some circumstances cross-examination is instrumentally valuable in securing accurate verdicts. But its value is probably overplayed generally, and may be very limited where it is directed at expert testimony.<sup>21</sup> The fact that the

---

<sup>18</sup> We appreciate that assessing the credibility of the expert witness and his or her opinion evidence will be required if the underlying techniques are admissible.

<sup>19</sup> Many of these arguments have implications for civil justice and judge-only trials, but they are beyond the scope of this article. See Andrew J Wistrich, Chris Guthrie and Jeffrey J Rachlinski, 'Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding' (2005) 153 *University of Pennsylvania Law Review* 1251.

<sup>20</sup> Mike Redmayne, 'Confronting Confrontation', in Paul Roberts and Jill Hunter (eds) *Criminal Law and Human Rights: Reimagining Common Law Procedural Traditions* (Hart Publishing, 2012) (forthcoming).

<sup>21</sup> See generally, Michael Lynch and David Bogen, *The Spectacle of History: Speech, Text and Memory at the Iran-Contra Hearings* (Duke University Press, 1996).



defendant is provided with an opportunity to exercise the right to examine witnesses against him or her should not be accorded too much weight in any inquiry to establish whether the state has discharged its duty to provide the most accurate procedures for determining innocence and guilt in cases that incorporate, and especially when they turn on, incriminating expert evidence.

Empirical studies, reviews of innocence project cases, the NRC report, and Edmond's ethnographic observations (of image and voice comparison evidence) suggest that in many cases cross-examination appears to be ineffective in exposing — let alone conveying the significance of — limitations, exaggeration and fraud. According to a recent review of the empirical literature by McQuiston-Surrett and Saks:

studies have found little or no ability of cross-examination to undo the effects of an expert's testimony on direct-examination, even if the direct testimony is fraught with weaknesses and the cross is well designed to expose those weaknesses. ... [I]t is unlikely that defense cross-examination ... will reduce the impact of the forensic expert witness's direct testimony.<sup>22</sup>

Many adversarial skirmishes appear to be perfunctory, misconceived or deliberately misleading. Advocates, and particularly defence lawyers, frequently focus their attention upon the chain of custody and conflicts of interest — the 'low-hanging fruit' — rather than more substantial methodological and interpretive issues.<sup>23</sup> Plausible sounding responses and appeals to experience and personal authority often mark the limits of cross-examination. Confronted with incriminating expert opinion evidence, defence lawyers may too often be content to negotiate pleas or focus their attention upon other aspects of the case rather than attempting genuinely to contest incriminating scientific and technical evidence.

Even where cross-examination is sophisticated, informed and *apparently* effective it is not obvious that its deconstructive potential will be appreciated (by the tribunal of fact or trial and appellate

---

<sup>22</sup> Dawn McQuiston-Surrett and Michael J Saks, 'The Testimony of Forensic Identification Science: What Expert Witnesses Say and What Factfinders Hear' (2009) 33 *Law and Human Behavior* 436, 439.

<sup>23</sup> Keith A Findley, 'Innocents at Risk: Adversary Imbalance, Forensic Science, and the Search for Truth' (2008) 38 *Seton Hall Law Review* 893; Brandon L Garrett and Peter J Neufeld, 'Invalid Forensic Science Testimony and Wrongful Convictions' (2009) 95 *Virginia Law Review* 1. In consequence there have been 'administrative fixes' to some of the re-occurring problems with particular technologies, see: Michael Lynch et al, *Truth Machine: The Contentious History of DNA Fingerprinting* (University of Chicago Press, 2008).

judges).<sup>24</sup> Moreover, the utility and efficacy of cross-examination in exposing unreliable or even speculative scientific and medical evidence may be undermined by other aspects of a prosecution case that work to overcome fragility in the incriminating expert opinion.

Similarly, instructions, warnings and directions loom large in judicial fairness rationalisations and trial management strategies.<sup>25</sup> The English Court of Appeal has acknowledged the problem of ensuring verdicts are rational in cases where conflicting medical evidence is the only material presented to the jury. In *R v Henderson*, the Court observed that '[t]o suggest, in cases where the expert evidence is fundamental to the case, that the jury should approach that expert opinion in the same way as they do in every other criminal case, is inadequate.'<sup>26</sup> It also accepted that juries, if left to their own devices are likely to flounder and resort to general impressions. The Court's response to these problems was to suggest that the jury be directed to consider: whether the witness had strayed beyond matters in respect of which he possessed expertise; whether the witness could point to a 'recognised' peer-reviewed source for the opinion; and whether the witness's clinical experience was current and equal to the experience of others whose evidence he sought to contradict. (Whether these sorts of considerations are useful for assessing the value of expert opinion is an issue to which we will return.) There is, however, a significant body of empirical research that suggests instructions, directions and warnings do not work well, particularly when given seriatim at the end of the trial.<sup>27</sup> Appellate courts seem to place inordinate faith in such apparently weak safeguards, but also in the ability of trial judges — dependent on evidence adduced by the parties — to discharge them adequately. Lawyers and judges appear to rely upon their experiential impressions and a belief that directions, instructions and warnings (must) work.<sup>28</sup>

---

<sup>24</sup> See Sheila Jasanoff, *Science at the Bar* (Harvard University Press, 1995); Michael Lynch, 'The Discursive Production of Uncertainty: The OJ Simpson "Dream Team" and the Sociology of Knowledge Machine' (1998) 28 *Social Studies of Science* 829. Compare Edmond, 'Science in Court: Negotiating the Meaning of a "Scientific" Experiment During a Murder Trial and Some Limits to Legal Deconstruction for the Public Understanding of Law and Science' (1998) 20 *Sydney Law Review* 361.

<sup>25</sup> Law Commission (UK), *Expert Evidence in Criminal Proceedings in England and Wales* (2011) [1.20]–[1.21], [3.41].

<sup>26</sup> [2010] EWCA Crim 1269 [13].

<sup>27</sup> In the main this has produced efforts to improve instructions rather than think about alternative and more effective approaches. See eg, the NSW Law Reform Commission, *Consultation Paper 4: Jury Directions* (2008). More generally, consider: Joel D Lieberman and Bruce D Sales, 'The Effectiveness of Jury Instructions' in Walter F Abbott and John Batt (eds), *A Handbook of Jury Research* (American Law Institute-American Bar Association, 1999).

<sup>28</sup> Lee E Teitelbaum et al, 'Evaluating the Prejudicial Effects of Evidence: Can Judges Identify the Impact of Improper Evidence on Juries?' (1983) *Wisconsin Law Review* 1147. See also Gary Edmond, Kristy Martire and Mehera San Roque, "'Mere guesswork": Cross-Lingual Voice Comparisons and the Jury' (2011) 33 *Sydney Law Review* 395.

These responses may make institutional sense but they are, nevertheless, if rectitude is the fundamental aim of the procedural system, irrational. They disregard decades of studies that suggest the value of directions, instructions and warnings is at best questionable and may undermine the attempt to obtain an accurate result fairly.<sup>29</sup> They also tend, and here *Henderson* provides a useful illustration, to focus attention on issues (eg experience and peer review) that are generally poor substitutes for empirical investigation and evidence of validity and reliability.

### *C The (In)Ability of the Jury to Determine the Reliability of Expert Evidence*

The underlying rationale for exempting experts from the prohibition on witnesses proffering opinions is that the subject matter might assist the jury in their fact-finding.<sup>30</sup> The function of the expert witness might be perceived as one of educating the jury generally on matters of which it has little or no knowledge.<sup>31</sup> However, as Roberts and Zuckerman explain, where the opinion relates to complex evidence or methodological issues, the idea that an expert can equip the jury with sufficient knowledge to enable it to conduct a satisfactory assessment is implausible.<sup>32</sup> The more realistic view, they suggest, is one of jury deference: from its disadvantaged (and sometimes functionally illiterate) position the jury can either defer to and accept the opinion advanced by an expert, or reject or ignore it on grounds that may not be entirely rational.<sup>33</sup> The judgment in *Henderson* provides an example of judicial acknowledgement of the problems of leaving the jury to determine the weight to assign to

---

<sup>29</sup> Those complacent about the clarity and value of judicial instructions, directions and warnings should consider the damning comments about the incoherence of many legal terms and doctrines, including beyond a reasonable doubt and the presumption of innocence in Laudan, above n 15.

<sup>30</sup> *R v Turner* (1974) 60 Cr App R 80, 83.

<sup>31</sup> Judges in most common law jurisdictions beyond the US have been remarkably reluctant to allow academic psychologists to testify about research pertaining to perception, memory, suggestion and identification and their problems. This restriction is predicated upon the highly questionable contention that such insights are common knowledge and within the experience of the jury.

<sup>32</sup> Paul Roberts and Adrian Zuckerman, *Criminal Evidence* (Oxford University Press, 2004) 294–5; Learned Hand, ‘Historical and Practical Considerations Regarding Expert Testimony’ (1901) 15 *Harvard Law Review* 40.

<sup>33</sup> Ronald J Allen and Joseph S Miller, ‘The Common Law Theory of Experts: Deference or Education?’ (1993) 87 *Northwestern University Law Review* 1131; Ronald J Allen, ‘Expertise and the *Daubert* Decision’ (1994) 84 *Journal of Criminal Law and Criminology* 1157.

expert opinion.<sup>34</sup> Implicit in the Court of Appeal's concern, that if left to its own devices the jury might use evidence improperly (and produce an irrational verdict), is the recognition that juries are not usually well-placed to evaluate complex or conflicting expert evidence.

There is empirical evidence suggesting that while lay persons are able to comprehend many forms of expert advice and even their underlying bases they nevertheless frequently encounter difficulties — especially when confronted with probabilistic and statistical evidence.<sup>35</sup> There is less evidence about jury responses to complex technical and methodological critiques, or how exposure to gratuitous contextual information has a tendency to corrupt expert interpretation and opinion.<sup>36</sup> The limited empirical research suggests that as expert testimony becomes more complex, juries tend to resort to peripheral matters and heuristics, such as the expert's credentials, in their evaluation of expert opinion.<sup>37</sup> The significance of this for our purposes is twofold. First, much incriminating expert opinion evidence is not credibly challenged even where there are serious methodological and reliability problems. Secondly, many of the substantial problems with forensic science and medicine seem to be methodological, statistical or linked to subtle forms of contamination. Whether we can expect lay individuals to follow critiques in these areas, or fully appreciate how they might undermine the probative value of incriminating opinion evidence, is open to doubt — though susceptible to empirical investigation. Where such evidence is not challenged we can confidently assume that juries will generally have few, if any, ideas about the evidentiary limitations or magnitude of risks. In many situations, liberal admissibility standards will systematically advantage the state with little evidence of corresponding improvements in the accuracy of decisions.

---

<sup>34</sup> *R v Henderson* [2010] EWCA Crim 1269.

<sup>35</sup> Research by experimental psychologists suggest such mistakes are common and widespread: Thomas Gilovich, Dale W Griffin and Daniel Kahneman (eds), *Heuristics and Biases: The Psychology of Intuitive Judgment* (Cambridge University Press, 2002). Continuing problems with the presentation of DNA evidence suggest that many lawyers and judges share these difficulties. Consider Margaret Bull Kovera and Bradley D McAuliff, 'The Effects of Peer Review and Evidence Quality on Judge Evaluations of Psychological Science: Are Judges Effective Gatekeepers?' (2000) 85 *The Journal of Applied Psychology* 574.

<sup>36</sup> Itiel E Dror, David Charlton and Alisa E Péron, 'Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications' (2006) 156 *Forensic Science International* 74; Michael D Risinger et al, 'The *Daubert/Kumho* Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion' (2002) 90 *California Law Review* 3.

<sup>37</sup> Joel Cooper, Elizabeth A Bennett and Holly L Sukel, 'Complex Scientific Testimony: How Do Jurors Make Decisions?' (1996) 20 *Law and Human Behavior* 379.

There is an extensive literature on public understanding of science and a range of psychological studies about juror capabilities. However, few studies replicate the complexities of the trial, where jurors are asked to determine weight in the context of an often powerful prosecution narrative. Nor do they address circumstances in which an opposing expert, if there is one, may appear — or be characterised — as a hired gun or from an ivory tower when compared to the apparently disinterested and experienced forensic scientist called by the prosecution.<sup>38</sup> We simply do not know enough about how such circumstances influence jurors. What we do know, however, does not present a positive portrait of current legal practice.

The fundamental question is whether the inclusion of apparently relevant but unreliable evidence, or apparently relevant evidence of unknown probative value, undermines the ability of the trier of fact to make an accurate overall assessment of evidence and determination of guilt.<sup>39</sup> On the basis of the available empirical evidence, there are sufficient grounds for doubting whether juries generally possess the ability to undertake a satisfactory evaluation of expert evidence of unknown probative value — regardless of cross-examination, expert disagreement or directions and warnings. Where such reservations are harboured in relation to other forms of evidence, hearsay or confession evidence for example, it is usual to find that the admissibility of such evidence is subject to restriction, or more rigorous scrutiny. This is a form of epistemic paternalism that some have argued ought to be extended to encompass expert opinion evidence. Because we cannot assume that the jury is capable of handling expert evidence of unknown reliability, so the argument goes, restrictions are justified on the grounds that they serve the pursuit of the truth. Consequently, they are generally in the best interests of the parties to proceedings, particularly the interests of an innocent defendant in a criminal trial.<sup>40</sup>

It is difficult to conceive how expert opinion evidence that is not demonstrably reliable would, in fact, assist a jury. A rational process cannot place blind faith in a lay jury, in the absence of evidence of

---

<sup>38</sup> Public understanding of science and technology is both complex and variegated. See Alan Irwin and Brian Wynne (eds), *Misunderstanding Science? The Public Reconstruction of Science and Technology* (Cambridge University Press, 1996).

<sup>39</sup> There is also the issue of fairness. Why should the accused bear the risk of unreliable evidence, especially if the mechanisms at their disposal are unlikely to persuade the fact-finder of limitations or the magnitude of failings?

<sup>40</sup> On epistemic paternalism generally see Alvin I Goldman, 'Epistemic Paternalism: Communication Control in Law and Society' (1991) 88 *The Journal of Philosophy* 113. On epistemic paternalism in relation to expert evidence, see Brian Leiter, 'The Epistemology of Admissibility: Why Even Good Philosophy of Science Would Not Make for Good Philosophy of Evidence' [1997] *Brigham Young University Law Review* 803; Joseph Sanders, 'The Merits of the Paternalistic Justification for Restrictions on the Admissibility of Expert Evidence' (2002) 33 *Seton Hall Law Review* 881.

reliability and in the midst of accusatorial criminal proceedings, to resolve complex or subtle technical questions.<sup>41</sup> If juries have difficulty, even if only occasionally, appreciating the limitations of expert opinion — such as *ipse dixit* based on speculative methods, or where there has been gratuitous exposure to potentially biasing information — then cross-examination and rebuttal evidence may not be an effective means of exposing the flaws in such evidence. Judicial warnings, to the extent that they address these issues, are unlikely to remedy them.<sup>42</sup> It seems to us that the adequacy of the procedures governing the reception of expert evidence will determine whether the state has discharged its primary duty in respect of procedural accuracy. In the context of the trial, the state must adopt the most effective procedure for ensuring that only expert evidence that is demonstrably reliable is admitted and presented to the tribunal of fact. Moreover, the tribunal of fact must be capable of understanding *and* evaluating any argument or disagreement — however complex or technical — with which it is presented.

### **D Formal Scrutiny of Reliability at the Admissibility Stage**

Relatively few judges, in any jurisdiction, have been particularly attentive to the reliability — in the sense of trustworthiness — of expert opinion. Indeed, at its most accommodating, the common law has allowed formally qualified experts to testify in the face of apparently universal dissent.<sup>43</sup> With the exception of the US and Canada, most common law jurisdictions make only occasional or incidental reference to the ‘reliability’ of expert evidence. ‘Availability’ and perceived ‘necessity’, in the sense that expert evidence is available and considered necessary for the case to proceed (or succeed), seem to motivate many admissibility decisions.<sup>44</sup> Apart

---

<sup>41</sup> There is also the problem of what to do when the questions are not raised, regardless of whether for tactical reasons, oversight or ignorance.

<sup>42</sup> There is also the problem, following from judicial scientific illiteracy, of the judges’ own comprehension of some of these issues. See Jennifer L Groscup et al, ‘The Effects of *Daubert* on the Admissibility of Expert Testimony in State and Federal Criminal Cases’ (2002) 8 *Psychology, Public Policy & Law* 339.

<sup>43</sup> The anachronistic response to expert opinion in the civil appeal of *Commissioner for Government Transport v Adamcik* (1961) 106 CLR 292 seems to resemble responses to emerging technologies in contemporary criminal proceedings, particularly in Uniform Evidence Law jurisdictions. See also *R v Robb* (1991) 93 Cr App Rep 161 (*‘Robb’*).

<sup>44</sup> The availability of (CCTV) images, of tremendously varying quality, has led many jurisdictions to find ways of admitting (often speculative) interpretations. See, eg, *Re Attorney-General’s Reference No 2 of 2002* [2002] EWCA Crim 2373; Edmond et al, ‘*Atkins v The Emperor*: The “Cautious” Use of Unreliable “Expert” Opinion’ (2010) 14 *International Journal of Evidence & Proof* 146.

from some marginal and non-prescriptive allusions in a handful of cases, courts in England and Wales, Australia (both common law and Uniform Evidence Law ('UEL') jurisdictions) and New Zealand have declined to impose any reliability threshold as part of their routine admissibility practice.<sup>45</sup>

Two influential appeals provide some indication of the manner in which English and Australian judges approach admissibility in criminal proceedings. These decisions, in response to admissibility challenges to incriminating expert opinions that were *not based on demonstrably reliable techniques*, illustrate how willing judges are to admit such evidence — including opinions of apparently low probative value.

In the first case, *Robb*,<sup>46</sup> identification evidence provided by a lecturer in phonetics was admitted, over objection, at trial. This witness was permitted to express an expert opinion about the identity of a speaker after listening to a recording, notwithstanding that the:

great weight of informed opinion, including the world leaders in the field, was to the effect that auditory techniques unless supplemented and verified by acoustic analysis were an unreliable basis of speaker identification. ... He had published no material which would allow his methods to be tested or his results checked. He had conducted no experiments or tests on the accuracy of his own conclusions. ... While accepting that he could be wrong, Dr Baldwin was led by his experience and training to believe that his conclusions were reliable.<sup>47</sup>

The Court of Appeal, nevertheless, found that the opinion (on the ultimate issue of identity) was admissible. *Robb* usefully illustrates how limitations that are evident in expert opinion evidence tend to be left for trial and the jury. This approach, and the interest in experience and/or qualifications and the existence of a 'field' of knowledge, remain the standard admissibility criteria.

---

<sup>45</sup> See, eg, *HG v The Queen* (1999) 197 CLR 414; *Velevski v The Queen* (2002) 187 ALR 233, 253 [82]; *Lewis v The Queen* (1987) 88 FLR 104; *Carroll v The Queen* (1985) 19 A Crim R 410; *Bonython v The Queen* (1984) 38 SASR 45 ('*Bonython*'); *DPP v Farquharson (No 2) (Ruling No 4)* [2010] VSC 210; *R v T* [2010] EWCA Crim 2439; *R v Reed* [2009] EWCA Crim 2698; *R v Cannings* [2004] EWCA Crim 1; *R v Henderson* [2010] EWCA Crim 1269; *R v Weller* [2010] EWCA Crim 1085; *R v Luttrell* [2004] EWCA Crim 1344. The exceptions tend to be reviews of wrongful convictions, some cases involving infant deaths, and DNA evidence (where there is a large non-forensic set of experts available to comment on practices and interpretations). New Zealand recently enacted its own Evidence Act; see *Evidence Act 2006* (NZ) s 26 and *Aryan v The Queen* [2010] NZCA 57.

<sup>46</sup> (1991) 93 Cr App Rep 161.

<sup>47</sup> *Ibid* 165. Contrast Malcolm Coulthard and Alison Johnson, *The Routledge Handbook of Forensic Linguistics* (Routledge, 2010); Philip Rose, *Forensic Speaker Identification* (Taylor & Francis, 2002).

Generally speaking, once the qualifications are established the methodology will be relevant to the weight of the evidence and not to the competence of the witness to express an opinion. The suitability and adequacy of the methods used may well be themselves a matter of expert opinion.<sup>48</sup>

More recent English decisions, particularly in response to controversy surrounding DNA and paediatric pathology evidence, have made more frequent reference to reliability. For example:

The probative value of such [expert identification] evidence depended on the reliability of the scientific technique, a matter of fact which was fit for debate and for exploration in evidence. So long as the field was sufficiently well-established to pass the ordinary test of relevance and reliability, no enhanced test of admissibility should be applied, but the weight of the evidence should be established by the same adversarial forensic techniques applicable elsewhere.<sup>49</sup>

Such decisions purport to capture long-standing convention. Generally, where an individual possesses qualifications in an established field, or experience considered relevant, English courts will undertake no further — or ‘enhanced’ — scrutiny. English judges are not particularly demanding about the existence of ‘fields’ and seem to be enthusiastic to readily embrace the products of technological progress.<sup>50</sup>

Most Australian judges have also been inattentive to the reliability of incriminating expert evidence.<sup>51</sup> The second case, one of the leading decisions, concerned the admissibility of an anatomist’s interpretation of low quality CCTV images associated with a robbery, for the purpose of identification. Unpacking the meaning of ‘specialised knowledge’ under s 79(1) of the UEL, the NSW Court of Criminal Appeal formally disavowed interest in ‘reliability’. According to the Chief Justice, ‘[t]he focus must be on the words “specialised

<sup>48</sup> *Bonython* (1984) 38 SASR 45, 46: ‘[W]hen it is established that the witness is an expert in the relevant field of knowledge, he will be permitted to express his opinion, however unconvincing it might appear to be ... The weight to be attached to his opinion is a question for the jury.’ *Bonython* has been, curiously, influential in England and Wales.

<sup>49</sup> *R v Dallagher* [2002] EWCA Crim 190. Endorsed, though, as ‘sufficiently reliable’ in *R v Reed* [2009] EWCA Crim 2698 and *R v T* [2010] EWCA Crim 2439.

<sup>50</sup> *R v Clarke* [1995] 2 Cr App R 425, 430, endorsed in *R v Dallagher* and *R v Murdoch* [2005] NTSC 78.

<sup>51</sup> The exception is, perhaps, *Lewis v The Queen* (1987) 88 FLR 104. There have been a few, rather casual, references to ‘reliability’, but no interest in enforcing a reliability standard. Indeed, judges tend to admit incriminating opinions in circumstances where the evidence is novel, speculative and developed in circumstances that are likely to make it unreliable. See also Law Commission, above n 25 [2.12].



knowledge”, not on the introduction of an extraneous idea such as “reliability””.<sup>52</sup>

In most Australian jurisdictions, and notwithstanding the statutory need for ‘specialised knowledge’ under the UEL, reliability seems to play no role in the determination of admissibility. Australian judges prefer to admit incriminating expert opinion evidence and leave its assessment to the tribunal of fact. Sometimes decisions about admissibility seem to be informed by whether the defence will adduce a rebuttal expert. That is, decisions about whether to admit incriminating expert opinion evidence are often eased by allowing each side to adduce expert evidence (even though the defence expert is merely challenging the value of the expert opinion adduced by the prosecution).<sup>53</sup>

Judges in most adversarial traditions place great confidence in the trial and the various safeguards, even though empirical studies have cast doubt on their actual capabilities. A clear expression of the preference for admission and contestation in the adversarial trial comes from the seminal *Daubert v Merrell Dow Pharmaceuticals, Inc* decision. There the majority accepted:

Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. ...the court remains free to direct a judgment...and likewise to grant summary judgment.<sup>54</sup>

In *Daubert*, notably a civil appeal, the US Supreme Court addressed the question of the admissibility of ‘scientific knowledge’ under the Federal Rules of Evidence (‘FRE’) enacted in 1975.<sup>55</sup> It concluded that an older and influential admissibility standard, based on whether a novel theory or technique had attained *general acceptance* in the relevant *field* (from *US v Frye*<sup>56</sup>), no longer governed the admission of scientific evidence.<sup>57</sup> The majority explained that for admission via

---

<sup>52</sup> *R v Tang* (2006) 65 NSWLR 681, 712 [137] (Spigelman CJ). See Gary Edmond and Mehera San Roque, ‘Quasi-justice: Ad Hoc Expertise and Identification Evidence’ (2009) 33 *Criminal Law Journal* 8.

<sup>53</sup> See, eg, *R v Jung* [2006] NSWSC 658.

<sup>54</sup> *Daubert v Merrell Dow Pharmaceuticals, Inc.*, 509 US 579, 596 (1993) (‘*Daubert*’). Note the inconsistency between the need for ‘reliability’ (discussed below) and the willingness to admit ‘shaky’ evidence.

<sup>55</sup> *Act of Jan 2, 1975*, 40 USC §472 (1988).

<sup>56</sup> 293 F 1013 (DC Cir 1923) (‘*Frye*’).

<sup>57</sup> Paul C Giannelli, ‘The Admissibility of Novel Scientific Evidence: *Frye v United States*, a Half Century Later’ (1980) 80 *Columbia Law Review* 6, 1197; David L Faigman, Elise Porter and Michael J Saks, ‘Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present, and Worrying about the Future of Scientific Evidence’ (1994) 15 *Cardozo Law Review* 1799.

Rule 702, ‘scientific’ evidence must be both ‘*relevant and reliable*’.<sup>58</sup> The majority provided four criteria (‘the *Daubert* criteria’) to help trial judges assess the *reliability* of scientific evidence.<sup>59</sup> These were whether the theory or technique: (1) has been tested (referring to Karl Popper’s concept of falsification); (2) has been published and/or peer reviewed; (3) has a known or potential rate of error; and (4) is ‘generally accepted’ in the relevant specialist community (from *Frye*).<sup>60</sup> The criteria, which according to the majority would ‘ordinarily’ be helpful, replaced (or subsumed) the ‘general acceptance’ standard and a range of other approaches to admissibility emerging across the various federal circuits.<sup>61</sup>

The influence of *Daubert*, however, has extended beyond the civil sphere and well beyond the boundaries of the jurisdiction in which it was decided. It provides the basis for recent proposals for law reform in England and Wales, and in a series of criminal appeals, dating from 2000, the Supreme Court of Canada has effectively supplemented its admissibility jurisprudence from *R v Mohan* with the *Daubert* criteria.<sup>62</sup> Culminating in *R v Trochym*<sup>63</sup> where a majority placed renewed emphasis on the need for reliability in response to Canadian experiences of wrongful convictions, along with an emerging awareness of some of the frailties of the adversarial trial, the Supreme Court of Canada has been an international leader in relation to admissibility in criminal proceedings. In *Trochym*, the majority moved the issue of the reliability of expert evidence to centre stage:

---

<sup>58</sup> Rule 702 of the FRE was designed to govern the admissibility of expert opinion evidence in US Federal Courts (as an exception to the general prohibition on opinion evidence provided by the exclusionary Rule 701). The original version of Rule 702 read: ‘If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.’ Amendment in 2000, in response to *Daubert*, *General Electric Co. v Joiner*, 522 US 136 (1997) (‘*Joiner*’) and *Kumho Tire Co v Carmichael* (1999) 526 US 127 (1999) (‘*Kumho*’), formalised the need for reliability in the FRE.

<sup>59</sup> Some commentators, including the NRC Committee, incorporate the elaboration and compliance with standards as a fifth criterion: see NRC, *Strengthening the Forensic Sciences in the US*, above n 3.

<sup>60</sup> *Daubert* 509 US 579, 596 (1993), 593. *Daubert* also introduced a sharp distinction between ‘methods’ and ‘conclusions’. This distinction, subsequently read down in *Joiner* 522 US 136 (1997), suggests that the majority may have initially accepted that (Popperian) falsification embodied ‘the scientific method’. In *Kumho* (1999) 526 US 127 (1999), the Court endorsed the *Daubert* decision and explained that the four criteria might be flexibly applied to determine the admissibility of non-scientific expert opinion.

<sup>61</sup> See eg *DeLuca v Merrell Dow Pharmaceuticals, Inc.*, 911 F. 2d 941 (3<sup>rd</sup> Cir 1990); *United States v Downing*, 753 F. 2d 1224 (1985); *Brock v Merrell Dow Pharmaceuticals, Inc.*, 874 F. 2d 307 (1989) modified, 884 F. 2d 166 (1989); *Christopherson v Allied Signal Corp.*, 939 F. 2d 1106 (5<sup>th</sup> Cir 1991).

<sup>62</sup> See Law Commission, *Expert Evidence*, above n 25; *R v Mohan* [1994] 2 SCR 9.

<sup>63</sup> [2007] 1 SCR 239 (‘*Trochym*’).

*Reliability is an essential component of admissibility. Whereas the degree of reliability required by courts may vary depending on the circumstances, evidence that is not sufficiently reliable is likely to undermine the fundamental fairness of the criminal process.*<sup>64</sup>

Reiterating earlier interest in *Daubert*, the *Daubert* criteria were characterised as ‘establishing a framework for assessing the reliability of novel science and, consequently, its admissibility in court’. The majority went even further and insisted on the need for all expert evidence to satisfy a reliability threshold, regardless of the novelty of the techniques or previous admissibility practice.<sup>65</sup>

*Daubert* and its progeny (*Kumho* and *Joiner*) generated interest in the reliability of expert evidence. In terms of ensuring the exclusion of unreliable forensic science and forensic medicine evidence, however, the ‘revolution’ associated with *Daubert* has been an abject failure.<sup>66</sup> Empirical studies suggest that the significance of *Daubert* is primarily symbolic and presentational: admonishing trial judges to be more vigilant in their gatekeeping practice, though primarily invoked to rationalise the exclusion of plaintiffs’ expert evidence in civil suits.<sup>67</sup> Admissibility outcomes are not discernibly different when jurisdictions that have adopted *Daubert* (or a *Daubert*-like approach) are compared to those that have not.<sup>68</sup> Though limited in scope, studies of the impact of *Daubert* on criminal proceedings, now illuminated by the NRC report, reveal that in the two decades since the decision, the new standard has made little practical difference. Thus far, US judges have not been conspicuously more exclusionary in their response to proffers of incriminating expert evidence. Revealingly, US judges have been largely inattentive to reliability and the *Daubert* criteria, preferring to base admissibility decisions upon traditional indicia such as formal qualifications and experience.<sup>69</sup> They have consistently preferred to

---

<sup>64</sup> Ibid [27] (emphasis added). *Trochym* was focused on evidence derived from hypnosis. See also *R v DD* [2000] 2 SCR 275; *R v L-JL* [2000] 2 SCR 600.

<sup>65</sup> *Trochym* [2007] 1 SCR 239, [31]–[34]. Cf Bastarache J at [139]. Trial and appellate courts have experienced difficulty with the application of these new approaches, see, eg, *R v Abbey* [2009] ONCA 624.

<sup>66</sup> Saks and Faigman, above n 3; Saks and Koehler, above n 3; NRC, above n 3, [3-1].

<sup>67</sup> Lloyd Dixon and Brian Gill, *Changes in the Standard for Admitting Expert Evidence in Federal Civil Cases Since the Daubert Decision* (Rand, 2001); Carol Krafska et al, ‘Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials’ (2002) 8 *Psychology, Public Policy and Law* 309. Many of the most developed expert evidence decisions in Australia are also responses to civil appeals by well-resourced parties. See, eg, *Makita Pty Ltd v Sprowles* (2001) 52 NSWLR 705 and *Dasreef Pty Ltd v Hawchar* (2011) 277 ALR 611.

<sup>68</sup> Edward K Cheng and Albert H Yoon, ‘Does *Frye* or *Daubert* Matter? A Study of Scientific Admissibility Standards’ (2005) 91 *Virginia Law Review* 471. See also Rebecca C Harris, *Black Robes, White Coats* (Rutgers University Press, 2008).

<sup>69</sup> Krafska et al, above n 67.

admit long-standing forensic science techniques (so-called ‘grandfathering’) rather than require satisfaction of a credible reliability threshold.<sup>70</sup> Interestingly, the different standards governing admissibility in adversarial courts across the common law world (including those beyond the US) appear to make little practical difference. Regardless of the particular standard, most adversarial jurisdictions admit a range of incriminating expert opinions derived from similar techniques and practices, many of which are not demonstrably reliable.

Ironically, and perversely in terms of principle, *Daubert* seems to have made it more difficult for the defence to adduce expert evidence that supports the defendant’s claim not to have done what is alleged. Notwithstanding the burden carried by the state, empirical studies by Groscup et al, and Risinger, suggest that while criminal defendants are reasonably likely to lose their *Daubert* challenges to incriminating expert opinion evidence, the state in contrast, is reasonably likely to prevail in its challenges.<sup>71</sup> In a system that purports to place a premium on not convicting the innocent, the relative reluctance to receive critical expert opinions seems misconceived and difficult to reconcile with the goal of helping lay fact-finders (and appellate courts) appreciate the value of incriminating expert opinion.<sup>72</sup>

Against expectations (and principle), admissibility standards — but not necessarily the actual criteria — seem to be applied more fastidiously to (exclude) expert opinion adduced by plaintiffs in civil litigation than to incriminating expert opinions (and the techniques on which they are based) that are relied upon by the state in criminal proceedings. This suggests that judges are both dependent upon, and vulnerable to, the respective resources and abilities of parties and their lawyers and experts. Perhaps more troubling is the implication that admissibility decisions are not always strictly governed by the relevant rules and might be shaped by other factors, such as concerns about crime, impressions of civil justice in crisis, and legal institutional legitimacy.<sup>73</sup> This might help to explain the general tendency to admit the state’s incriminating expert evidence — even after *Daubert* — as

---

<sup>70</sup> Simon A Cole, ‘Grandfathering Evidence: Fingerprint Admissibility Rulings From *Jennings* to *Lera Plaza* and Back Again’ (2004) 41 *American Criminal Law Review* 1189.

<sup>71</sup> D Michael Risinger, ‘Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?’ (2000) 64 *Albany Law Review* 99, 135–52; Groscup et al, above n 41. See, eg, *R v Madigan* [2005] NSWCCA 170.

<sup>72</sup> On whether the same admissibility standard should apply to the defence, see Edmond and Roach, above n 1.

<sup>73</sup> Gary Edmond and David Mercer, ‘*Daubert* and the Exclusionary Ethos: The Convergence of *Corporate* and *Judicial* Attitudes Towards the Admissibility of Expert Evidence in Mass Toxic Torts’ (2004) 26 *Law & Policy* 231.

well as the sceptical and exclusionary disposition toward expert evidence adduced by plaintiffs and criminal defendants.

The unwillingness to consider reliability at the admissibility stage in England and Wales, and Australia, or to take difficult decisions to exclude evidence that is not reliable in the United States and Canada, accentuates disparities in the criminal justice process. It means that the safety of convictions is dependent on the quality of defence lawyers, their ability to access experts, and to challenge incriminating expert opinions during the trial *effectively* (in a way that is understood by lay juries and judges in the context of the overall proceedings).

### *E General Exclusionary Discretion*

In most jurisdictions, in addition to formal admissibility standards, judges have a discretion to exclude evidence if the danger of unfair prejudice, or risk that the trial will be unfair, outweighs the probative value of the evidence. Among the recognised dangers is the risk that the jury may misuse or misunderstand the evidence and that the defence will not be in a position to adequately test the evidence or convey its limitations. Predictably, judges do not always invoke this discretion to exclude incriminating expert evidence, even where the probative value of the evidence is unknown, and even in jurisdictions where the obligation to exclude is mandatory.<sup>74</sup>

The failure to exclude incriminating forensic science and medicine evidence — including untested techniques and speculative opinions — using judicial discretion is remarkable, because more than any other type of evidence, the validity and reliability of most techniques and the proficiency of individual experts can be determined. Many forms of forensic science and medicine are susceptible to empirical evaluation that would allow credible assessment of their actual probative value. This means that the balancing exercise does not need to be hypothetical or imaginary. Probative value, along with the actual dangers to the accused, could readily be ascertained.

The failure to attend to the actual probative value of incriminating expert evidence means that some of the real evidentiary dangers and procedural disadvantages confronting the accused are not seriously considered. Where, for example, an opinion is based on a subjective interpretation (or *ipse dixit*), as in the case of image or voice comparison, such as that proffered in *Robb*, conventional safeguards may not be practical or effective means of exploring or overcoming limitations. The same may be true where an expert utilises a process

---

<sup>74</sup> See, eg, *Evidence Act 1995* (Cth) s 137. On its face s 137 would seem to be more onerous, and therefore exclusionary, than similar provisions in England, also derived from *R v Christie* [1914] AC 545, and the US FRE (such as Rule 403).

that exposes him or her to a range of extraneous information that, regardless of scientific training, is likely to cause bias and substantially increase the chance of error. Where extraneous information and bias influence an expert's analysis and opinion, it will almost always be the case that they operate unconsciously, and procedural mechanisms such as cross-examination are unlikely to reveal such influences.

Where the probative value of expert evidence is low or unknown there will always be a very real danger that the jury will defer to the expert or accept the expert's opinion when they ought to reject it or be far more circumspect. This danger exists whether the opinion is central or merely part of a more comprehensive circumstantial case. Judges should be willing to exclude incriminating expert evidence, especially where it depends upon subjective interpretations, unless there is persuasive evidence that the opinion has genuine probative value. There will always be the danger that forensic safeguards are inadequate, that the defence will not be sufficiently competent, nor able to obtain the resources or support to mount effective challenges. The evidence might attract considerable attention resulting in weight being attached to it that is inconsistent with its actual probative value. Jurors may simply defer to prosecution experts, or use other incriminating evidence as a makeweight or independent corroboration. This last possibility might occur where experts have access to information about the case that is extraneous to their analysis thereby compromising the actual independence and value of apparently corroborative opinions.

### III Presumption of Innocence

It has been suggested that its prevalence in human rights documents, national constitutions and the like, attests to the importance of a suspect's right to be presumed innocent until a formal finding of guilt is delivered.<sup>75</sup> In its broadest sense the presumption requires those involved in the administration of the criminal justice system to adopt a certain attitude towards the suspect; to treat him or her at all times prior to the issuing of a verdict as though he or she were innocent. However, it is more common for the presumption to be conceived in a narrower sense. This focuses on its role in the criminal trial, as the normative justification for allocating the burden of proof to the state and requiring the alleged wrongdoing to be proved beyond reasonable doubt (to avoid convicting an innocent person).

As Laudan explains, there is a logical nexus between the presumption and the burden of proof: '[I]f the defendant is genuinely presumed innocent, then it naturally follows that the state must defeat

---

<sup>75</sup> See Stefan Trechsel, *Human Rights in Criminal Proceedings* (Oxford University Press, 2005) 153; Andrew Ashworth, 'Four Threats to the Presumption of Innocence' (2006) 10 *International Journal of Evidence and Proof* 241.

that presumption by proving his guilt.’<sup>76</sup> Ashworth has offered an account of the presumption in which he suggests that the importance that is attached to it reflects the seriousness of the moral (and physical) harm that occurs when a defendant is wrongfully convicted. We suggested earlier that the innocent have a moral right to acquittal and that this provides the justification for a derivative right to the most accurate procedures for determining guilt and non-guilt. However, as Ashworth notes, no jurisdiction has produced a form of criminal trial that provides a guarantee of accuracy. The difficulty of reconstructing past events is such that fact-finding in criminal trials is inherently fragile and this fragility may be exacerbated by an imbalance in the resources available to the state and defendant respectively. In light of this, the presumption requires those engaged in the investigation and fact-finding process to adopt a protective attitude towards the defendant or, to put it another way, to approach the allegations against the accused with an appropriate degree of scepticism.<sup>77</sup> The requirement that the prosecution prove its case beyond reasonable doubt is an obvious manifestation of this goal, but the presumption has implications beyond the process of proof in criminal trials. We offer some brief observations on these broader implications after considering the implications of the burden and standard of proof for the reception and use of expert evidence.

### *A Allocating the Risk of Error: The Burden and Standard of Proof*

In adversarial criminal trials, the state carries the burden of proving *beyond a reasonable doubt* (or some similarly onerous standard) that the accused committed the criminal act or acts. ‘Beyond a reasonable doubt’ is the standard of proof conventionally imposed upon — really assumed by — the state. Failure to prove every element of the offence beyond a reasonable doubt should lead to acquittal.<sup>78</sup> In terms of proof, the accused is given the benefit of any deficiencies in the case and any doubt. In theory, it is the state that bears, or should bear, the risk of non-persuasion. If the state cannot persuade the tribunal of fact of guilt beyond reasonable doubt then the accused should go free. This includes persons who are probably, or even very likely, guilty. The very high standard of proof imposed upon the state is intended to embody an asymmetrical approach to proof of guilt reflecting the

---

<sup>76</sup> Laudan, above n 15, 90.

<sup>77</sup> Ho, above n 9, 179, 226–7, 331.

<sup>78</sup> There are exceptions, as with some defences and pleas of not guilty by virtue of mental illness, where burdens are imposed upon the accused.

premium placed on innocence and the desire to avoid convicting innocent persons.<sup>79</sup>

What impact, if any, should the existence of an overarching standard (of proof), and placing that burden upon the state, exert on the reception and use of expert opinion evidence? The admission of weak or unreliable expert opinions may undermine satisfaction of the standard and burden.<sup>80</sup> The main question is whether the imposition of proof beyond a reasonable doubt is sufficient — on its own or in conjunction with the other safeguards — to address the risks that unreliable expert opinion may result in the conviction of an innocent person. As argued above, in most adversarial jurisdictions, including those that formally impose a reliability threshold (eg the US and Canada), trial judges do not necessarily scrutinise incriminating forensic science and medicine evidence in much detail. As we have suggested, in most cases, scrutiny — even where a *voir dire* or *Daubert* hearing is held — tends to be perfunctory. Judges tend to be much more attentive to earlier admissibility decisions, both foreign and domestic, the professional qualifications and experience of experts, and the perceived ‘necessity’ of the expert evidence, than to the reliability of techniques and opinions or how incriminating expert opinions may affect proof.

If safeguards and protections are not particularly effective, then it may be that the burden and standard of proof has to assume the major — and occasionally the entire — responsibility for protecting the accused. Problems with the safeguards and with the synergistic effects of expert and non-expert evidence lead us to contend that the exclusion of expert evidence, including evidence that is (probably) relevant but not demonstrably reliable, might be the best response and one of the few means of ensuring that the innocent are not convicted.

Recently, Laudan offered a provocative critique of many exclusionary rules; deriding their tendency to generate false acquittals. It is his contention that relevance, and perhaps some notion of reliability, should govern the admission of all evidence. Laudan is concerned that the imposition of exclusionary rules in addition to the *formally* high standard of proof imposed upon the state is excessive and, in effect, encourages a kind of double counting *against* conviction. For Laudan, exclusionary rules that ensure fact-finders are deprived of

---

<sup>79</sup> Alexander Volokh, ‘n Guilty Men’ (1997) 146 *University of Pennsylvania Law Review* 173.

<sup>80</sup> Remarkably, this problem was acknowledged (at least) in response to an expert’s credentials by the English Court of Appeal in *Robb* (1991) 93 Cr App Rep 161, 166: ‘We are alive to the risk that if, in a criminal case, the Crown are permitted to call an expert witness of some but tenuous qualifications the burden of proof may imperceptibly shift and a burden be cast on the defendant to rebut a case which should never have been before the jury at all. A defendant cannot fairly be asked to meet evidence of opinion given by a quack or charlatan or an enthusiastic amateur.’



certain forms of incriminating evidence<sup>81</sup> confer an unwarranted benefit on defendants and skew errors in favour of unjustified acquittals.<sup>82</sup>

It is not entirely clear, from the few casual references in the text, whether Laudan would extend this argument to expert opinion evidence or approves of *Daubert*. That is, would he allow the admission of expert opinion evidence that is not demonstrably reliable, leaving it to the tribunal of fact to assign weight to this evidence based on the vagaries of the trial and the burden and standard of proof governing the case? This omission is particularly unfortunate because Laudan is an important and influential philosopher of science.<sup>83</sup> Nevertheless, even conceding that there is some strength in Laudan's various arguments, in relation to other types of evidence, forensic science and medicine generally deserve to be treated differently, regardless of whether they are epistemologically special. Most techniques from forensic science and medicine, especially those used repetitively, can be assessed to ascertain their validity and/or the proficiency of the analyst. This is in marked distinction to most other types of evidence and testimony. In addition, we contend that empirical studies of expert opinion evidence, along with the NRC report and analysis of DNA exonerations, indicate that safeguards and protections do not work well. (This is a point about which Laudan is generally agnostic and does not discuss in detail.) Further, empirical studies suggest that expert evidence may exert a disproportionate influence on decision-making, *even when experts are wrong*.<sup>84</sup> In consequence, we contend that Laudan's general argument about the adequacy of the overall standard and burden of proof does not apply, or should not be applied, to incriminating expert opinion evidence even were it considered persuasive in relation to other types of evidence.

While there is little doubt that weak scientific evidence might assist in the construction of a compelling circumstantial case, recourse to, and reliance at trial on, unreliable expert evidence or expert evidence of unknown probative value, demeans proof. Generally, where the state relies upon unreliable expert evidence or evidence of

---

<sup>81</sup> Confession evidence, and evidence that reveals that the defendant has been convicted of other offences, or has acted in a discreditable way on previous occasions, for example.

<sup>82</sup> Laudan, above n 15, 68. For Laudan, standards of proof (such as 'beyond reasonable doubt') are 'best conceived as a mechanism for distributing errors'.

<sup>83</sup> See, eg, Larry Laudan, *Progress and its Problems: Toward a Theory of Scientific Growth* (University of California Press, 1977), and 'Science at the Bar — Causes for Concern' (1982) 7 *Science, Technology & Human Values* 16.

<sup>84</sup> Laudan, above n 15, 215. Cf Richard Kemp, Stephanie Heidecker and Nicola Johnston, 'Identification of suspects from video: Facial mapping experts and the impact of their evidence', paper presented at the 18th Conference of the European Association of Psychology and Law, Maastricht, 2-5 July 2008; Findley, above n 23; Jim Dwyer, Peter J Neufeld and Barry Scheck, *Actual Innocence: Five Days to Execution and other Dispatches from the Wrongly Convicted* (Doubleday, 2000).

unknown probative value there is an unnecessary and unacceptable risk that an innocent person will be convicted. The risk is created by judges preferring admission (to exclusion) and allowing lay fact-finders to apportion any weight they like to incriminating expert opinion.

There is a further limitation with the allocation of the burden and standard of proof, even ostensibly asymmetrical allocations, as the primary vehicle for protection of the accused. It is not clear that they operate in the way superior courts suggest. Several scholars have suggested that jurors tend to prefer the most persuasive story. In consequence, actual standards of proof may play quite a variable role in jury decisions about guilt and non-guilt.<sup>85</sup> The story model is unsettling because in many trials only the state develops a coherent narrative or case theory. In some cases the only evidence adduced by the defence is rebuttal expert evidence or concessions obtained through cross-examination. Allowing the state to rely upon untested techniques and/or to adduce weak or speculative, but incriminating, expert opinions, may improve its narrative without any real addition to its substance. There is no guarantee that limitations, exaggeration, errors, forms of bias, and contamination, will be exposed or even considered. The reality is that the state has a near monopoly on most forensic sciences, and vastly greater resources at its disposal for the preparation and presentation of forensic science and medical evidence at trial. This, as well as the state's ability to mount significant challenges to the evidence of rebuttal witnesses and defence experts, merely accentuates these dangers.

Wrongful convictions demonstrate that the burden and standard of proof, even in conjunction with other trial safeguards, can and do fail. These are perhaps clearest in cases based on DNA exonerations associated with various innocence projects. In the majority of these cases, some involving the most serious offences, the individuals wrongfully convicted were not merely 'not guilty', they were factually innocent. The adversarial trial and the deliberately onerous burden of proof imposed upon the state did not prevent jurors from returning guilty verdicts and appellate courts from upholding convictions. One of the interesting findings of systematic review of the 'innocence project' cases is that mistaken, exaggerated and even fraudulent, forensic science evidence seems to feature regularly in the case against the accused. Such evidence was routinely corroborated, or at least appeared to be corroborated, by non-expert evidence — frequently, mistaken

---

<sup>85</sup> Nancy Pennington and Reid Hastie, 'A Cognitive Theory of Juror Decision Making: The Story Model' (1991) 13 *Cardozo Law Review* 519; Ronald J Allen and Brian Leiter, 'Naturalized Epistemology and the Law of Evidence' (2001) 87 *Virginia Law Review* 1491.

eyewitness identification evidence.<sup>86</sup> Rather than drawing upon demonstrably reliable techniques to provide independent support for other aspects of a case, or to generate doubt or reliable ‘feedback’ during the course of an investigation, incriminating expert evidence was often contaminated or developed in ways that were indifferent to contamination and reliability. In wrongful conviction cases, the criminal standard of proof, even in conjunction with judicial gatekeeping, defence lawyers, cross-examination, the occasional defence expert, judicial directions and warnings, and appellate review did not identify reasonable doubts. DNA exonerations should give proponents of the adversarial trial and its attendant safeguards grounds for pause. When it comes to incriminating expert evidence the right to procedural accuracy appears to require scrutiny of reliability at the admissibility stage to compensate for the evaluative shortcomings of the trial (and appeal).<sup>87</sup> But the state’s obligations in respect of this right go further; the accused is entitled to *the most effective* form of scrutiny.

### ***B Beyond the Burden and Standard of Proof***

Notwithstanding widespread naïve optimism about its capabilities, it is not obvious that the adversarial trial is capable of consistently identifying or adequately conveying the serious weaknesses or limitations of incriminating expert evidence, and the existence of other inculpatory evidence will often draw attention away from these limitations. In particular, it is not clear that the overall burden and standard of proof, even purportedly onerous standards such as beyond a reasonable doubt, operate in ways that consistently uphold the fundamental commitment to avoiding the conviction of the innocent or facilitating a fair trial — let alone assisting in the ascertainment of truth (ie factual rectitude). For, how can opinions based on a technique that could be assessed, but has not been, be said to contribute to truth?

These problems ought to encourage us to take more seriously the elimination of the risks of convicting an innocent accused. Vindication of the right of an innocent person not to be convicted cannot be achieved by procedural arrangements regarding the burden and standard of proof alone. If the presumption of innocence requires

---

<sup>86</sup> Garrett and Neufeld, ‘Invalid forensic science testimony’, above n 23. Cf Stephen T Goudge, *Inquiry into Pediatric Forensic Pathology in Ontario* (Queens Printer, 2008).

<sup>87</sup> Compare Ho, above n 9, 67. See also Shari Seidman Diamond, ‘Truth, Justice, and the Jury’ (2003) 26 *Harvard Journal of Law & Public Policy* 143, 150.

those in whose hands the fate of the accused lies to approach the allegations against him with an appropriate degree of scepticism, or to adopt a protective attitude, its demands seem rather more onerous. Trechsel, for example, suggests that the presumption is linked to the right to an impartial tribunal.<sup>88</sup> Trial judges should not harbour any preconceived ideas about the accused's guilt, nor exercise discretion on this basis, for example by favouring the prosecution in decisions about the admissibility of expert evidence. We referred earlier to empirical research that suggests the presumption seems to carry little weight in such circumstances. Defendants in criminal trials are unlikely to succeed in challenging the admissibility of prosecution expert evidence in admissibility (eg *Daubert*) hearings. Prosecutors, by comparison, tend to be relatively successful when challenging the admissibility of expert evidence — including rebuttal opinion — on which the defence seeks to rely.<sup>89</sup>

The presumption of innocence might also inform various aspects of professional ethics. The prosecutor's pursuit of conviction of the guilty is not incompatible with the presumption's requirement that he or she adopt a protective attitude and approach the allegations with an appropriate degree of scepticism. A broad conception of the presumption of innocence seems to be related both to the right to procedural accuracy and the best evidence rule.<sup>90</sup> A robust adherence to the presumption would require prosecutors to demonstrate that they have approached the allegations with appropriate scepticism, or have adopted a sufficiently protective attitude towards the suspect. In respect of expert opinion evidence, this might mean that a prosecutor who seeks, for example, to prove identity, and could avail him or herself of various forms of forensic science evidence, must use demonstrably reliable evidence in preference to a form of evidence based on a technique or theory the reliability of which has not been or cannot be tested (cf *Robb*). This ought to be the case even if the expert whose testimony is based on the latter is willing to provide an opinion that appears, at least superficially, more probative.<sup>91</sup> There would seem to be a duty to proffer the most reliable expert evidence that could reasonably be adduced.<sup>92</sup> Accordingly, this broad conception of the

---

<sup>88</sup> Trechsel, above n 75, 164.

<sup>89</sup> Risinger, above n 71; Groscup et al, above n 42.

<sup>90</sup> Dale A Nance, 'The Best Evidence Principle' (1988) 73 *Iowa Law Review* 227.

<sup>91</sup> Similarly, the prosecutor who is able to draw on a range of opinion within a particular scientific discipline ought to rely on assumptions that have the firmest scientific foundations, even if the expert qualifies his or her opinion in way that may undermine the probative value of evidence, and others who might be called to testify do not.

<sup>92</sup> If the case is one that turns on expert evidence, the presumption of innocence might require the prosecutor to refrain from proceeding to trial where that expert evidence takes the form of an untested technique or speculative opinion: see Ashworth, above n 75, 249. No citizen should be required to make a defence or to disprove guilt unless

presumption seems to provide the grounds for a substantive legal right that accommodates the moral right to procedural accuracy.

Of course all of this might be vulnerable to the criticism that it has no foundation in law. While our analysis is normative, it is also consistent with common law principles that pre-date the relatively recent trend that utilises human rights as an analytical framework. There is a long-standing view that the role of the prosecutor is not to obtain a conviction by any means possible.<sup>93</sup> Rather, he or she is under a duty to act as a minister of justice.<sup>94</sup>

#### IV Rules, Discretion and Authority: A Special Advisory Panel?

Rather than wilful judicial subversion of the relevant legal standards, the ineffectiveness of *Daubert* and other admissibility standards might, in part, be a manifestation of the judiciary's lack of scientific knowledge and understanding, along with exaggerated confidence in the adversarial trial. There is some empirical support for the concerns expressed by various commentators that *Daubert* might be unduly presumptuous when it comes to the judiciary's capacity to evaluate the reliability of the science (or expertise) that forms the basis of much forensic science and medicine evidence.<sup>95</sup>

What seems to be needed is some kind of mechanism to assist judges with the assessment of expert evidence.<sup>96</sup> This should apply not only to evidence based on novel and emerging techniques, but also to all forms of scientific, technical and experiential evidence. It should be concerned with reliability and the way information about the reliability of techniques and approaches is obtained and presented.

---

and until certain thresholds have been passed. Thus a defendant should not have to answer a charge at trial until the prosecution have produced sufficient evidence to establish a prima facie case.

<sup>93</sup> *Nyron Smith v The Queen* [2008] UKPC 34; *Randall v The Queen* [2002] 1 WLR 2237.

<sup>94</sup> *Boucher v The Queen* (1954) 110 Can CC 263, 270. See also *R v Puddick* (1865) 4 F & F 497, 499; *R v Banks* [1916] 2 KB 621, 623.

<sup>95</sup> Consider the comments, by Rehnquist CJ and Stevens J in their dissent in *Daubert*, along with the approach adopted by Kozinski J in the Fifth Circuit Court of Appeals in *Daubert v Merrell Dow Pharmaceuticals, Inc.* 43 F.3d 1311 (9th Cir. 1995). See also Déirdre Dwyer, *The Judicial Assessment of Expert Evidence* (Cambridge University Press, 2008) 343: 'On a practical level [*Daubert*] requires a degree of scientific literacy on the part of judges that it is unreasonable to expect.' Mike Redmayne, *Expert Evidence and Criminal Justice* (Oxford University Press, 2001) 113: 'It may be that, even with the *Daubert* guidelines judges are not well-placed to decide whether the methodology on which expert evidence is based is sound.'

<sup>96</sup> It might be that even a rigorously enforced reliability standard will not prove adequate to overcome trial and appellate limitations. If so, more radical reforms to procedures and institutions might be required.

Those who would be responsible for formulating an alternative approach need to take into account that the task of locating appropriate (theoretical) authority on the issue of reliability is one that must be undertaken with limited resources.<sup>97</sup> They would need to identify whose views on the validity of a particular technique should be taken as authoritative. It is here that the example of the NRC Committee would seem to have something to offer. In order to support this contention, first, let us explain some of the very real limitations with traditional attempts to solicit information about ‘acceptance’ from a particular scientific community before moving to discuss the creation of an advisory panel to assist with the assessment of the reliability of expert opinion evidence.

Ideas of community acceptance — like those associated with *Frye* — are both more complicated and less satisfactory than they might at first appear. Requiring trial judges to determine whether there is consensus (or acceptance) in the relevant field or scientific community sets them a task that is insufficiently determinate and insufficiently indexed to ability or the quality of the evidence. There really is no ‘scientific community’. The idea of a homogenous scientific community is largely imaginary.<sup>98</sup> Those engaged in science, biomedicine, engineering and other forms of technical practice participate in a broad range of heterogeneous practices that are not unified by a single method or universal set of norms, values or commitments.<sup>99</sup> In many situations, and this is an issue for legal practice and policy making, the field or fields that should be counted as the relevant community or communities will be legitimately contested and very often fractured.<sup>100</sup> There will be ever fewer cases where those with relevant expertise emerge uncontested from a single community, discipline or field.

Additionally, there is no ready means of ascertaining the beliefs or commitments of constituents, or even ascertaining the extent of the

---

<sup>97</sup> Joseph Raz, *Between Authority and Interpretation: On the Theory of Law and Practical Reason* (Oxford University Press, 2009) 136. Raz’s idea of a *theoretical authority* might be useful here. The word of a theoretical authority provides us with a reason to hold some belief. The directives of a *practical authority*, on the other hand, provide us with reasons to perform some act. See generally, Brian O’Shaughnessy, *The Will: A Dual Aspect Theory* (Cambridge University Press, 2<sup>nd</sup> ed, 1980) vol 1, 53–72.

<sup>98</sup> The scientific ‘community’ is as imaginary as Anderson’s political community. See Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (Verso, 1991).

<sup>99</sup> Harry M Collins and Trevor J Pinch, *The Golem: What Everyone Should Know About Science* (Cambridge University Press, 1993); Steven Shapin, *The Scientific Life: A Moral History of a Late Modern Vocation* (University of Chicago Press, 2008).

<sup>100</sup> Thomas F Gieryn, *Cultural Boundaries of Science: Credibility on the Line* (University of Chicago Press, 1998).

relevant membership. Apart from surveys, the views of ‘community’ members will often be the subject of speculation.<sup>101</sup> Moreover, the professional identity of many ‘members’, along with representations of their precise expertise and views on particular issues, may vary depending on the contexts in which they are engaged. These difficulties are rarely addressed, or even considered, when only one witness — or even a handful of witnesses — selected by the parties enters the courtroom. They are compounded if the witness is (or witnesses are) from a field or sub-field that is not representative or sufficiently familiar with methodological and practical issues that might influence the value of their practice and opinions. As a legal heuristic, ‘general acceptance’ tends to substitute interest in methodology and reliability for a superficial inquiry into whether there *appears* to be support beyond the courtroom. Historically, general acceptance has been enlivened with very limited interest in levels of acceptance or what precisely was accepted. Judges concerned with ‘acceptance’ have tended to devote very limited time and attention to the more fundamental issues of validity, reliability and proficiency.

General acceptance, along with many recent procedural reforms and proposals for reform, particularly those designed to reduce or eliminate partisanship or generate institutional efficiencies — such as via court-appointed experts, shared or joint experts, concurrent evidence (so-called ‘hot tubs’) and pre-trial meetings — may provide a range of procedural efficiencies and benefits, but they are not oriented to the most fundamental issues for procedural accuracy: the validity and reliability of techniques supporting incriminating expert opinions.<sup>102</sup> By diverting attention from the need to demonstrate reliability, judges (and proponents of many reform proposals) undermine the entitlement to procedural accuracy.

At this point, we can return to the example of the NRC committee. It is our contention that, rather than relying solely upon witnesses called by adversarial parties or deferring to the institutionalised forensic sciences, *initial admissibility determinations* should be guided by the advice of a specialist committee.<sup>103</sup> We

---

<sup>101</sup> Harry M Collins, ‘Tantalus and the Aliens: Publications, Audiences and the Search for Gravitational Waves’ (1999) 29 *Social Studies of Science* 163.

<sup>102</sup> See, eg, Lural L Hooper, Joe S Cecil, Thomas E Willging, ‘Assessing Causation in Breast Implant Litigation: The Role of Science Panels’ (2001) 64 *Law and Contemporary Problems* 139; Gary Edmond, ‘Merton and the Hot Tub: Scientific Conventions and Expert Evidence in Australian Civil Procedure’ (2009) 72 *Law and Contemporary Problems* 159.

<sup>103</sup> Institutionally, a less radical alternative would be to fund en banc/bene esse hearings (as in the case of *R v Henderson* [2010] EWCA Crim 1269), but this would probably be more expensive and consume the time of appellate judges rather than highly skilled specialists. The proposed panel should be distinguished from the less engaged stakeholder advisory committee formed under the Forensic Science Regulator in the UK.

propose the formation of a multidisciplinary advisory panel ('MAP') to review controversial forensic science techniques prior to their use in criminal proceedings.<sup>104</sup> Possessed of (theoretical) authority, arising from independence, demonstrated competence and disciplinary breadth, a standing MAP could provide transparent and reasoned assessments of techniques and technologies that are promoted as part of the forensic science and medicine arsenal.<sup>105</sup> Ideally, the panel should review techniques before trials in order to improve investigations, facilitate trial preparation, ease and standardise legal admissibility determinations, and reduce the redundancy associated with lax standards and recurring contests over 'weight' in individual trials.<sup>106</sup> Existing techniques, especially where they are used routinely and not supported by experimental studies, should also be obliged to undergo review. In effect, the MAP would function as a kind of certifying agency, transforming technical authority into legal institutional legitimacy.

Like the NRC committee, a MAP should be composed of a range of members with different scientific and technical training, though representation from statistics, biomedicine, engineering, chemistry and experimental psychology would seem to be highly desirable. One or two representatives of the forensic sciences should be included along with an experienced trial judge and a legal scholar. There ought, in addition, to be scope to extend membership should particular forms of expertise be required. Such a panel would bring together a wide range of experience and expertise, as well as avoiding the partisanship of the individual trial, the parochial nature of particular fields and sub-fields (whether scientific, technical or experiential), and questions about whether particular techniques derive from an established 'field'.<sup>107</sup> Its orientation should be primarily epistemological — exploring the 'knowledge base' (ie published experimental results) supporting techniques and methods.<sup>108</sup> The panel should be able to hear from relevant individuals, institutions and communities, and conduct appropriate inquiries into the validity and reliability of techniques and methods. Its primary purpose would be to

---

<sup>104</sup> Such a panel could be ad hoc, although there would seem to be considerable value in continuity of membership. We recognise that other models have been proposed, but believe this is quite different. See, eg, Benjamin N Cardozo, *The Growth of the Law* (Yale University Press, 1924) 117; Jerome Frank, 'The Place of the Expert in a Democratic Society' (1949) 16 *Philosophy of Science* 3, 23–4; Hand, above n 32, 56.

<sup>105</sup> Such a panel is not intended to prevent further controversy but to find socially and epistemologically credible ways of managing uncertainty and risk.

<sup>106</sup> In contrast, the Law Commission, above n 25, recommends increased use of court-appointed experts.

<sup>107</sup> The MAP should operate independently of any particular trial as it would be a body making recommendations about the reliability of techniques and interpretations of those techniques.

<sup>108</sup> NRC, above n 3.



review the available ‘knowledge base’ rather than undertake actual experiment or independent study. It should report on a technique: what is known, what is unknown, what research or refinements are required (as well as desirable), how accurate the technique is (if that can be ascertained), and how any results could be expressed — *all based on empirical evidence*. The panel’s assessment should be disseminated in a short, publicly accessible document that supports conclusions through reference to research and empirical evidence. It should make an assessment of, and recommendations about, reliability rather than admissibility.<sup>109</sup> Decisions about admissibility should remain with the trial judge or court of appeal.

With those who would contend that such a process is slow and unwieldy, we agree. But given the frailties of the current system and the premium placed on the need to avoid convicting the innocent; the need for rectitude and fairness and to use resources more efficiently, waiting to hear authoritatively that a technique is demonstrably reliable is consistent with procedural accuracy and a rational system of criminal justice.<sup>110</sup> There is, in addition, value in relying upon proven, or demonstrably reliable, techniques and practices for investigations and prosecutions. The unsatisfactory alternative is to admit scientific, technical and medical opinions of unknown reliability and hope that any weaknesses will be exposed and recognised in individual trials (and appeals) by lawyers, jurors and judges of varying abilities.

Use of a MAP facilitates engagement with independent experts without the need for radical institutional reform. It has the institutional benefit of partially circumventing the need for dramatically enhanced judicial scientific and technical literacy, and means that the expectations placed on adversarial safeguards will be reduced, though not eliminated.<sup>111</sup> It will also reduce the burden on the defence by requiring the state pro-actively to support incriminating expert opinion with evidence of capability. Recourse to the advice of a group of independent experts allows the focus to be on validity and reliability rather than crude and inadequate surrogates, such as: whether a ‘body of knowledge or experience’ (ie, a field) exists or is sufficiently mature; levels of acceptance; qualifications and experience; and previous admissibility decisions. We accept that an advisory panel may not be without problems and some controversy, but that is the nature of expertise.

---

<sup>109</sup> It may be that the panel will need to revisit earlier advice as new data emerges or techniques are substantially refined.

<sup>110</sup> There is, however, no need to wait for legal references. A panel could operate pro-actively as new techniques are developed and deployed by police and investigative organisations.

<sup>111</sup> There will still be a need for better training and funding for lawyers and judges. See Goudge, above n 86, vol 4, and discussion in David L Faigman, *Constitutional Fictions: A Unified Theory of Constitutional Facts* (Oxford, 2008) 159–67.

Use of an advisory panel to assist with inaugural admissibility determinations (and substantial refinements to methods and the expression of results) is not intended to replace or subsume the need for cross-examination, exclusionary discretions, or the other safeguards, however (in)effective they might be. Even ‘certified’ techniques may encounter problems or be used or interpreted improperly.

Our current legal personnel and procedures have difficulty with incriminating expert evidence. In the end our argument is about the institutional value of deferring, though not surrendering, to an authoritative group of experts rather than a defence of general acceptance or judicial gatekeeping, more generally. Trial and appellate judges should consider the reliability of expert opinion evidence and the advice of a MAP will substantially assist them in this goal.

## V Principle and Pragmatism: The Poverty of Free Proof

Evidence is the basis of justice: to exclude evidence is to exclude justice.<sup>112</sup>

Justice and truth are not separate and competing goals but integrated and concurrent aims ... justice must be done in the pursuit of truth.<sup>113</sup>

Bentham’s ideas about the need to include all relevant evidence have been influential on evidence scholars (from Thayer to Laudan) and trial practice across the common law world. However, drawing upon both principle and emerging empirical evidence, we have argued that inclusive approaches to incriminating expert opinion evidence are likely to threaten accuracy and subvert attempts to do justice ‘in the pursuit of truth’. The inclusion of unreliable expert opinion and expert opinion of unknown reliability increases the risk of convicting the innocent accused. Consequently, it is our contention that judges should be required, but should also be willing, to exclude incriminating expert evidence that is not demonstrably reliable. How they should determine reliability requires serious attention. Given the current limitations we propose formal admissibility standards incorporating reliability in conjunction with an independent multidisciplinary advisory panel (MAP), while recognising that more

---

<sup>112</sup> Jeremy Bentham, *The Works of Jeremy Bentham, vol 7 (Rationale of Judicial Evidence Part 2) Published under the Superintendence of his Executor John Bowring*, (William Tait, 1843) 24.

<sup>113</sup> Ho, above n 9, 268–339; Jack B Weinstein, ‘Some Difficulties in Devising Rules for Determining Truth in Judicial Trials’ (1966) 66 *Columbia Law Review* 223, 227.

fundamental and disruptive reforms are conceivable, and may yet be required.<sup>114</sup>

Even if none of the major principles guiding the application of rules and procedures require that incriminating expert evidence be reliable, we contend that the need for demonstrable reliability is a consequence of the limitations of the trial and legal practice, and the uncertain state of much forensic science and medicine. However, we believe that overarching criminal justice principles do require reliability. Either way, we wonder how a rational system of justice can be indifferent to the reliability of incriminating expert opinions, especially when in the vast majority of cases, validity (or proficiency) could be readily ascertained. If trial processes and protections are ineffective or inconsistent in their operation, then the great faith invested in the burden of proof, lay fact-finders and appellate processes is seriously undermined.

With the spread of *Daubert*-style admissibility standards, reliability discourse has become increasingly common. Nevertheless, reliability standards have yet to be credibly utilised. Lawyers and judges must develop procedures that demand evidence of reliability. Here they require assistance. They, along with relevant policy-makers, should be looking to experiment with institutional mechanisms that will provide better quality expert evidence. We should not admit incriminating expert opinions simply because a jury might accept them. The possibility of jury acceptance is a very unsatisfactory basis for assessing the relevance and admissibility of a kind of evidence that has repeatedly proven to be flawed, exaggerated and overvalued. Forensic science and medicine should be treated differently to other kinds of evidence. Not merely because of their potential to confuse and mislead, but because the state has advantages, such as resources and the ability to evaluate techniques, and because it is difficult to correct misleading or mistaken expert evidence. The state and the accused are not in similar positions when it comes to acquiring, let alone assessing (ie testing) or challenging (through preliminary hearings, at trial and on appeal), the value of incriminating expert evidence. In practice, the state is much better positioned to evaluate (and challenge) expert opinion evidence. The state is the only party capable of consistently resolving questions about the reliability of forensic science and medicine evidence. The state can sponsor research or choose not to rely upon expert opinions that are not empirically or even theoretically warranted.

---

<sup>114</sup> Overall the most valuable single reform available would be for trial and appellate judges to take their gatekeeping responsibilities seriously: that is, to develop and apply admissibility jurisprudence that takes account of the emerging empirical record (so-called reflexive gatekeeping) and holds the state to an admissibility standard based on demonstrable reliability.

Admissibility standards are currently undervalued and underutilised. They constitute a far more important aspect of trial practice than many lawyers and judges seem to appreciate. Jury trials and appeals are rather weak and inconsistent mechanisms for assessing the reliability, and therefore the probative value, of incriminating expert evidence. In consequence, many convictions rest — even if only in part — on unreliable expert opinion or expert opinion that is not sufficiently reliable to be part of an accusation made by the state. In many cases it is unlikely that these limitations were exposed or appreciated by the tribunal of fact or those reviewing convictions.

Following in Bentham's purportedly rationalist footsteps, proponents of free proof would seem to be misguided. They effectively ignore the substantial and ubiquitous frailties of adversarial criminal practice. In their appeal to rectitude, linked to strong claims about a rational legal order that requires all evidence to be admitted, they are insufficiently attentive to the relevance and reliability of incriminating expert opinion evidence, the efficacy of trial procedures and protections (eg cross-examination, the burden of proof and jury warnings), the adequacy of appellate review and, for our purposes, serious and yet to be answered questions about the 'knowledge base' supporting forensic science and forensic medicine. The philosophical elegance and intuitive appeal of free proof may have been mortally wounded by the limitations, inelegance and unintended asymmetries embedded in contemporary legal practice.