

(AD)MINISTERING JUSTICE: EXPERT EVIDENCE AND THE PROFESSIONAL RESPONSIBILITIES OF PROSECUTORS

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I INTRODUCTION: TRIAL BY THEORY

A system that allows prosecutors, police, and prosecution experts to present scientific evidence without effective challenge, a system that is adversarial in name and theory but non-adversarial in reality, is likely to create habits and attitudes conducive to the abuse of scientific evidence.¹

This article offers a reassessment of the professional obligations of prosecutors in relation to forensic science and medicine evidence. Drawing upon longstanding and widely-referenced prosecutorial obligations, expressed and accepted in most common law jurisdictions, it endeavours to explain why traditional interpretations of obligations, codes and norms are no longer suited to decisions to prosecute, plea negotiations and many trial (and pre-trial) practices. Continuing adherence to traditional practices and commitments, in the face of confronting evidence about forensic science and medicine and critical insights into trial processes, means that fundamental criminal trial objectives and trial protections have, in effect, been denuded of substantial value or meaning.

This article examines the manner in which prosecutorial obligations are understood and applied in light of emerging evidence about system performance. It aims to challenge the longstanding, though empirically tenuous, commitment to adversarialism and trial safeguards as adequate responses to problems with incriminating expert evidence. In this way it is intended to encourage prosecutors (and, indirectly, other trial participants) to reconsider how their existing obligations ought to operate given this (*new*) state of affairs.

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1 Kevin C McMunigal, 'Prosecutors and Corrupt Science' (2007) 36 *Hofstra Law Review* 437, 443.

Rather than merely criticise and insist on the need for more rules and more aggressive disciplinary responses, this article embodies an attempt at consciousness raising and reconceptualisation. It suggests that fresh (and uncontradicted) insights into serious and widespread problems with the forensic sciences and medicine *in conjunction with* evidence of trial and appellate frailties require prosecutors, individually and collectively, to reconsider their approaches to the adduction and presentation of incriminating expert evidence. The article identifies the primary obligations of the prosecutor given the accusatorial trial's preoccupation with truth and justice (that is, rectitude and fairness).² It infuses these obligations – particularly the prosecutor's role as a 'minister of justice' – with substance. It then suggests ways of rehabilitating prosecutorial performance so that contemporary practice is reconciled with longstanding values and aspirations.

By focusing on evidence of system performance the risk of abstraction, and idealisation of legal processes and safeguards, is reduced. Moreover, this article is concerned with the ordinary criminal trial rather than some theoretical process or the rare, high-profile trial where well-resourced defendants are able to infuse some of the many rights and safeguards – such as defence counsel, admissibility standards, cross-examination, rebuttal experts, directions and warnings and appeals – with substance and/or effect.³

Rather than restrict itself to a particular jurisdiction or set of professional rules, the article invokes broad principles (and some specific rules that appear to be widely accepted) governing the conduct of trials and the performance of trial personnel, though especially prosecutors. It is focused almost exclusively on prosecutors, even though other participants (for example, investigators, judges, defence lawyers, expert witnesses and jurors) have vital roles to play in criminal proceedings, including their preparation and review. Without wanting to marginalise these other participants (and the need for parallel responses and/or reforms), the prosecutor's position is special, indeed privileged. Prosecutors are in the best position to regulate the appearance – in both senses – and reliance placed upon forensic science and medicine evidence. For, 'the prosecutor dominates the system, has exclusive control of the evidence, and decides ... how that evidence will be used.'⁴

2 See, eg, *Polk County v Dodson*, 454 US 312, 318 (Powell J) (1981); *Mackey v Montrym*, 443 US 1, 13 (Burger CJ) (1979); *R v Handy* [2002] 2 SCR 908; *Dietrich v The Queen* (1992) 177 CLR 292; *M v The Queen* (1994) 181 CLR 487; *Grey v The Queen* (2001) 184 ALR 593; *R v Soma* (2003) 212 CLR 299; *Mallard v The Queen* (2005) 224 CLR 125; *Libke v The Queen* (2007) 230 CLR 559.

3 Judges typically assume that the system is organised so that it provides genuine protection to those accused of criminal acts. See, eg, *United States v Garsson*, 291 F 646, 649 (Learned Hand J) (SDNY, 1923).

4 Bennett Gershman, 'Misuse of Scientific Evidence by Prosecutors' (2003) 28 *Oklahoma City University Law Review* 17, 18. See also Bruce Green and Fred Zacharias, 'Prosecutorial Neutrality' (2004) 2004 *Wisconsin Law Review* 837; Erik Luna and Marianne Wade, 'Prosecutors as Judges' (2010) 67 *Washington and Lee Law Review* 1413.

II CONTEXTUAL BACKGROUND

This article emerges out of a particular historical milieu. The context includes two decades of critique, sometimes trenchant, of many forensic science and medicine techniques routinely used in investigations and routinely admitted in criminal proceedings.⁵ The context also includes revelations about the inconsistent, though typically poor, performance of adversarial legal systems in response to forensic science and medicine.⁶

These two factors, the value of forensic science evidence and the performance of the trial, are tightly coupled. Prosecutors and judges have played important roles in the (premature) recognition and social legitimation of many types of expert evidence. Significantly, oft valorised trial procedures and safeguards facilitated admission and reliance, without necessarily exposing widespread and serious deficiencies with many forensic science and medicine techniques – see Part IV(A).⁷ This background casts a bleak pall over criminal justice practice and the complacency of assumptions maintained (and defended) by prosecutors, defence lawyers, judges and those recognised by courts as

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- 5 Influential scholarly criticisms include: Michael Risinger, Mark P Denbeaux and Michael J Saks, 'Exorcism of Ignorance as a Proxy for Rational Knowledge: The Lesson of Handwriting "Expertise"' (1989) 137 *University of Pennsylvania Law Review* 731; Michael J Saks, 'Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science' (1998) 49 *Hastings Law Journal* 1069; David L Faigman, *Legal Alchemy: The Use and Misuse of Science in the Law* (WH Freeman, 1999); D Michael Risinger et al, 'The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion' (2002) 90 *California Law Review* 1; D Michael Risinger and Michael J Saks, 'A House with No Foundation' (2003) 20 *Issues in Science & Technology* 35; Margaret Berger, 'Expert Testimony in Criminal Proceedings: Questions Daubert Does Not Answer' (2003) 33 *Seton Hall Law Review* 1125; David L Faigman, *Laboratory of Justice: The Supreme Court's 200-Year Struggle to Integrate Science and the Law* (Henry Holt, 2004); Jane Campbell Moriarty and Michael J Saks, 'Forensic Science: Grand Goals, Tragic Flaws, and Judicial Gatekeeping' (2005) 44 *Judges' Journal* 16; Margaret A Berger, 'What Has a Decade of Daubert Wrought?' (2005) 95 *American Journal of Public Health* 59; William C Thompson, 'Analyzing the Relevance and Admissibility of Bullet-Lead Evidence: Did the NRC Report Miss the Target?' (2005) 46 *Jurimetrics* 65; Peter J Neufeld, 'The (Near) Irrelevance of *Daubert* to Criminal Justice' (2005) 95 *American Journal of Public Health* 107; Erica Beecher-Monas, *Evaluating Scientific Evidence: An Interdisciplinary Framework for Intellectual Due Process* (Cambridge University Press, 2007).
- 6 The context includes supplementary experimental and observational studies of trial practices, including some of my own. For analyses of specific techniques, their methodological problems and legal responses in Australia, see Gary Edmond et al, 'Law's Looking Glass: Expert Identification Evidence Derived from Photographic and Video Images' (2009) 20 *Current Issues in Criminal Justice* 337; Gary Edmond, Kristy Martire and Mehera San Roque, 'Unsound Law: Issues with ("Expert") Voice Comparison Evidence' (2011) 35 *Melbourne University Law Review* 52; Gary Edmond, Matthew B Thompson and Jason M Tangen, 'A Guide to Interpreting Forensic Testimony: Scientific Approaches to Fingerprint Evidence' (2013) 12 (forthcoming) *Law, Probability and Risk*.
- 7 There is a prevalent neo-Benthamite commitment to admission, sometime associated with 'free proof'. See, eg, Larry Laudan, *Truth, Error, and Criminal Law: An Essay in Legal Epistemology* (Cambridge University Press, 2006).

experts.⁸ Unavoidably, this background must inform the way we now approach professional obligations (and professional rules and adjectival law) and understand the performances of lawyers, judges and experts as well as past convictions.⁹

A Forensic Science (and Medicine)

Recent reviews of the forensic sciences have exposed serious and widespread problems.¹⁰ They suggest that the long and symbiotic relationship between courts, police, investigators, technicians and forensic analysts has produced a range of practices and conventions that have been inattentive to the actual value of techniques and the capabilities of analysts. Effectiveness in disposing of cases, witness experience, and judicial acceptance have played more conspicuous roles in the admission of *expert* opinion than formal scientific evaluation, transparency and attention to jury comprehension.¹¹ In order to convey some sense of these problems and their magnitude, the obvious place to begin is a report produced by the United States National Academy of Sciences ('NAS') in 2009.¹²

In 2006, following congressional appropriation, the NAS established a committee (the 'Committee') under the auspices of the National Research Council ('NRC') – composed of eminent scientists and biomedical researchers, engineers, mathematicians, physicians and lawyers – to inquire into the condition of the forensic sciences. The resulting report, *Strengthening the Forensic Sciences in the United States: A Path Forward*, was remarkably critical in tone. To its surprise, the Committee found serious problems across the forensic sciences.¹³ The Committee expressed genuine doubts about the evidentiary value of many techniques used routinely in criminal prosecutions. We can observe endemic problems, particularly the lack of scientific rigour, in the Committee's findings in relation to research, standards (and their application) and threats from contextual bias.

8 'Expert' is sometimes italicised to reinforce the point that in many cases we do not know whether those proffering opinions actually possess expertise (or 'specialised knowledge'). Generally, I have preferred 'forensic analyst' because many of those recognised by courts as 'experts' or 'forensic scientists' do not possess formal scientific qualifications.

9 On the implications for admissibility practice, see, eg, Gary Edmond, 'Specialised Knowledge, the Exclusionary Discretions and Reliability: Reassessing Incriminating Expert Opinion Evidence' (2008) 31 *University of New South Wales Law Journal* 1.

10 It is important, by way of caveat, to acknowledge that there are some very reliable techniques and interpretive practices in use. However, there are many types of evidence in routine use that are of unknown value – and there are good reason to believe some have serious limitations. Even techniques that are demonstrably reliable are often operated in ways that are unnecessarily error-prone (eg, by exposing analysts to domain irrelevant information).

11 See Special Issue, 'Impressions and Expressions' (2013) 45 *Australian Journal of Forensic Sciences* 248-322.

12 National Research Council of the National Academies, *Strengthening the Forensic Sciences in the United States: A Path Forward* (The National Academies Press, 2009) ('NRC Report').

13 Harry Edwards, 'Solving the Problems that Plague the Forensic Science Community' (2009) 50 *Jurimetrics* 5. Judge Edwards was co-chair of the NRC Committee.

Speaking generally at the introduction of the NRC Report, the Committee explained:

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.¹⁴

The Committee emphasised both the importance and feasibility of undertaking research, particularly validation studies:

One particular task of science is the validation of new methods to determine their reliability under different conditions and their limitations. ... To confirm the validity of a method or process for a particular purpose (eg, for a forensic investigation), validation studies must be performed.¹⁵

And, yet:

Little rigorous systematic research has been done to validate the basic premises and techniques in a number of forensic science disciplines. The committee sees no evident reason why conducting such research is not feasible ...¹⁶

Moreover, the Committee placed considerable emphasis on gauging uncertainty and error:

All results for every forensic science method should indicate the uncertainty in the measurements that are made, and studies must be conducted that enable the estimation of those values. ... [T]he accuracy of forensic methods resulting in classification or individualization conclusions needs to be evaluated in well-designed and rigorously conducted studies. The level of accuracy of an analysis is likely to be a key determinant of its ultimate probative value.¹⁷

Validation studies determine the conditions in which techniques work as well as the level of error. They provide an empirical foundation for the development of standards and protocols and help to guide the way results are reported.

On standards, the Committee found:

Often there are no standard protocols governing forensic practice in a given discipline. And, even when protocols are in place ... they often are vague and not enforced in any meaningful way. In short, the quality of forensic practice in most disciplines varies greatly because of the absence of adequate training and continuing education, rigorous mandatory certification and accreditation programs, adherence to robust performance standards, and effective oversight. These shortcomings obviously pose a continuing and serious threat to the quality and credibility of forensic science practice.¹⁸

Significantly, the absence of research means that even where standards are in place they are not necessarily empirically warranted or effective.

Lack of research also manifested in wide discrepancies in the terms used by forensic scientists to express their conclusions in reports and testimony:

14 NRC Report, above n 12, 9, 87 (emphasis in original).

15 Ibid 113.

16 Ibid 189.

17 Ibid 184, 122.

18 Ibid 6.

[T]he forensic science disciplines have not reached agreement or consensus on the precise meaning of ... terms. ... This imprecision in vocabulary stems in part from the paucity of research in forensic science and the corresponding limitations in interpreting the results of forensic analyses.¹⁹

The Committee also voiced concern about widespread indifference to threats from contextual bias. There was, it explained, a conspicuous need for

research programs on human observer bias and sources of human error in forensic examinations. Such programs might include studies to determine the effects of contextual bias in forensic practice (eg, studies to determine whether and to what extent the results of forensic analyses are influenced by knowledge regarding the background of the suspect and the investigator's theory of the case). In addition, research on sources of human error should be closely linked with research conducted to quantify and characterize the amount of error.²⁰

These findings and their implications are unsettling. In response to 'identification' (or comparison) techniques used routinely in criminal investigations and prosecutions (for example, voice, image, foot, shoe and tyre mark comparisons, ballistics, latent fingerprints and toolmarks, etc), the Committee's conclusions are disturbing:

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 simple reality is that the interpretation of forensic evidence is not always based on scientific studies to determine its validity. This is a serious problem.²¹

In response to the lack of research and widespread failure to use (or even recognise the need for) orthodox methodological practices to support techniques routinely relied upon by investigators and in criminal proceedings, the NRC Report embodied doubts about the ability of legal institutions to address the problems.²² Rather than rely on legal responses, the Committee recommended 'upstream' solutions based around establishing a national institute capable of providing research leadership, undertaking or supervising the necessary research, developing research-based standards and managing quality control.²³

Significantly, the NRC is not alone in its critical appraisal. More recent reports focused specifically on latent fingerprint evidence – one of the oldest techniques in the forensic science arsenal – have confirmed serious limitations with underlying assumptions, comparison practices, the expressions used by

19 Ibid 185–6.

20 Ibid 24, 191.

21 Ibid 7–8, 87.

22 Ibid 85, 12, 53, 96, 109, 110.

23 The NRC Committee was composed mainly of scientists so it might not be surprising that they were unimpressed with legal practice and saw the establishment of a national institute supervised by scientists as the appropriate solution. Some commentators have emphasised these problems, as well as the lack of sufficient technical expertise or a research culture among forensic science practitioners. See Jennifer L. Mnookin et al, 'The Need for a Research Culture in the Forensic Sciences' (2011) 58 *UCLA Law Review* 725.

fingerprint examiners (that is, equating a ‘match’ with positive identification and individualisation), as well as the lack of research.²⁴

A report jointly sponsored by the United States National Institute of Standards and Technology (‘NIST’) and the National Institute of Justice (‘NIJ’) reinforced the critical assessment of the dominant approach to latent print comparison known by the acronym ACE-V – intended to capture the four stages of Analysis, Comparison, Evaluation, and Verification.²⁵ The NIST/NIJ report explains:

Although ACE-V is a systematic process, meaning that the examination proceeds in an orderly and logical fashion, this does not, by itself, demonstrate that the results are accurate and reproducible. In 2009, a committee of the National Research Council (NRC) stated that ACE-V is ‘a broadly stated framework for conducting friction ridge analyses. However, this framework is not specific enough to qualify as a validated method for this type of analysis. ... Merely following the steps of ACE-V does not imply that one is proceeding in a scientific manner or producing reliable results.’ Additional study is required to ascertain precisely how well examiners using the process perform under either controlled conditions or in casework ...

Although many in the latent print community describe the ACE-V process as a scientific method, the issue is not the label that can or should be attached to the process with respect to human factors. ACE-V is a systematic, skill-based, and widely used process for determining whether two impressions have a common origin. ACE-V designates a logical sequence for a complex process of judgment, but ACE-V itself does not provide substantive guidance about standards to be applied within this sequence. Therefore, even though two examiners might both assert (correctly) that they are using ACE-V, they may be employing different cognitive processes. Those differences create opportunities for human factors to come into play.²⁶

Simultaneously, a review of fingerprint evidence and practice in Scotland, following a high profile misattribution, produced findings consistent with those reported by the NRC and NIST/NIJ.²⁷ Reports from both sides of the Atlantic advocated the need for substantial changes to procedures and practice. Recommendations include: not equating a ‘match’ with a positive identification (that is, individualisation); not claiming that fingerprint comparison methods are

24 Earlier research by Simon Cole and the Habers had been critical of many of the practices associated with latent fingerprint comparison and reporting. See Simon Cole, *Suspect Identities: A History of Fingerprinting and Criminal Identification* (Harvard University Press, 2001); Simon A Cole, ‘More than Zero: Accounting for Error in Latent Fingerprint Identification’ (2005) 95 *Journal of Criminal Law and Criminology* 985; Simon A Cole, ‘Is Fingerprint Identification Valid? Rhetorics of Reliability in Fingerprint Proponents’ Discourse’ (2006) 28 *Law & Policy* 109; Lyn Haber and Ralph Norman Haber, ‘Scientific Validation of Fingerprint Evidence under Daubert’ (2008) 7 *Law, Probability and Risk* 87. The Habers concluded: ‘We have reviewed available scientific evidence of the validity of the ACE-V method and found none’: 105.

25 Expert Working Group on Human Factors in Latent Print Analysis, *Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach* (US Department of Commerce, National Institute of Standards and Technology, National Institute of Justice, 2012) 1 (‘NIST/NIJ Report’).

26 *Ibid* 9, 39, 123–4. The quote embedded in this extract is taken from the NRC Report, above n 12, 142.

27 An inquiry was conducted in Scotland by Lord Campbell in the aftermath of controversy surrounding the case of Shirley McKie. See Anthony Campbell, *The Fingerprint Inquiry Report* (APS Group Scotland, 2011) (‘Campbell Report’).

basically infallible; and developing probabilistic approaches to reporting results. Consider the following:

Recommendation 3.7

Because empirical evidence and statistical reasoning do not support a source attribution to the exclusion of all other individuals in the world, latent print examiners should not report or testify, directly or by implication, to a source attribution to the exclusion of all others in the world.²⁸

Recommendation 3

Examiners should discontinue reporting conclusions on identification or exclusion with a claim to 100% certainty or on any other basis suggesting that fingerprint evidence is infallible.²⁹

Here, again, contextual bias was highlighted as a threat requiring immediate attention:

Recommendation 3.3

Procedures should be implemented to protect examiners from exposure to extraneous (domain-irrelevant) information in a case.³⁰

Recommendation 6

The SPSA [Scottish Police Services Authority] should review its procedures to reduce the risk of contextual bias.³¹

Revealingly, the lack of research, weak methods and superficial standards, misleading expressions, and inattention to the threats from bias were identified about a century after latent fingerprints were first admitted in common law courts. The reports imply that latent fingerprint examiners have historically exaggerated the value of their opinions – as positive evidence of identification – in thousands of investigations and prosecutions *and continue to do so*.³² They also expose the surprising lack of sophistication and insight developed by lawyers and judges across thousands of contested adversarial proceedings. Notably, for prosecutorial practice, the critical findings, particularly the need for research, and dozens of recommendations for change, were directed at one of the relatively few ‘identification’ techniques that has been validated – albeit only in 2011.³³

Significantly, as the NRC Report insisted, the dearth of underlying research, the lack of validation studies and information about error, indifference to bias,

28 NIST/NIJ Report, above n 25, 72. The NIST/NIJ Report also recommended that ‘examiners should qualify their conclusions instead of stating an exclusion of identification in absolute terms’: at 77.

29 Campbell Report, above n 27, 741.

30 NIST/NIJ Report, above n 25, 44.

31 Campbell Report, above n 27, 741.

32 Risks have become more significant in recent decades with the emergence of automated fingerprint systems that confront analysts with very similar non-matching prints. See Itiel E Dror and Jennifer L Mnookin, ‘The Use of Technology in Human Expert Domains: Challenges and Risks Arising from the use of Automated Fingerprint Identification Systems in Forensic Science’ (2010) 9 *Law, Probability and Risk* 47.

33 See Jason M Tangen, Matthew B Thompson and Duncan J McCarthy, ‘Identifying Fingerprint Expertise’ (2011) 22 *Psychological Science* 995; Bradford T Ulery et al, ‘Accuracy and Reliability of Forensic Latent Fingerprint Decisions’ (2011) 108 *Proceedings of the National Academy of Sciences of the United States of America* 7733.

and inattention to the effects of different forms of expression (on decision-makers) all extend beyond latent fingerprint comparison to other forensic techniques. Serious problems persist with ballistics and tool marks, shoe, foot and tyre prints, bite marks, the use of images and voice recordings, gait, hair, fibre and document comparison, soil analysis and so on.³⁴ These techniques, most lacking formal validation and research-based standards, are routinely admitted and relied upon in courts in Australia (and England, Canada, New Zealand and the United States ('US')).³⁵

B Is Australia Exceptional?

It might be tempting to think that problems with the forensic sciences in the US and Scotland are jurisdictionally constrained, with limited application to Australia.³⁶ For a variety of reasons such a response seems misguided. Australian investigators routinely use many of the techniques and practices criticised in the NRC, NIST/NIJ and Campbell reports. While there are some important differences in the organisation, training and funding of the forensic sciences, as well as in legal practice and cultures across these jurisdictions, most of the fundamental concerns explained in the reports have direct application to Australia. Many of the techniques criticised by authoritative multidisciplinary committees in the US and in Scotland are substantially similar, or the same, as those used in Australia (and England, Canada and New Zealand and so on). Many of the forms of reporting and expressions employed by forensic analysts are shared, indeed directly mimicked, across these jurisdictions.

Most conspicuous, and most detrimental to claims of Australian exceptionalism, is the shared dearth of research – especially validation studies. Notably, the NRC, NIST/NIJ and Campbell reports did not appeal to Australian research or the Australian example as a solution to the serious problems they each identified and confront. The reports confirm the breadth of the research crisis. In almost all cases, because of the universal nature of the modern sciences, if there is no research available to attentive publics in the US then there is no relevant research elsewhere (and vice versa). This, in effect, means that many of the criticisms in the NRC Report, especially those critical of the research base, apply more or less across the board. The lack of research is not a jurisdictional problem but a global one. This means that Australians must also be uncertain about whether many techniques in routine use are reliable. The lack of validation studies also means that any standards in place in Australia and the way in which

34 NRC Report, above n 12, ch 5. It is the techniques that were derived from mainstream scientific applications, such as DNA profiling and various chemical assays, which tend to be well understood and standardised. They are not, however, free from interpretive difficulties and other forms of error.

35 See, eg, *Western Australia v Rayney* [No 3] [2012] WASC 404 and the discussion of the forensic pathology evidence against Kathleen Folbigg in Emma Cunliffe, *Murder, Medicine and Motherhood* (Hart Publishing, 2011).

36 Two of the reviewers questioned this assessment of the forensic sciences. There seems to be a widespread belief in the reliability of most forensic science and a faith in the ability of trial mechanisms to credibly identify and explain weaknesses.

forensic analysts express their conclusions often lack empirical foundations. Consequently, in very many cases the opinions of Australian forensic analysts are (also) impressionistic and speculative, lacking demonstrable scientific foundations.

Given the lack of research, the lack of research-driven standards and expressions, and the indifference to contextual bias and cognitive contamination, it seems simply wrong to assume that Australia is exceptional or insulated from criticism on the basis of differences in organisation, training and levels of funding.³⁷ Given the serious concerns expressed by authoritative committees and reviewers, it seems misguided to simply assume, in the absence of positive evidence to the contrary, that Australian forensic science and medicine are qualitatively different. Those who claim that the Australian forensic sciences are special or that the various criticisms raised in this essay are inapposite should, given the stakes and the countervailing consensus among authoritative reviewers and commentators, provide positive evidence.³⁸

The example of fingerprint evidence is instructive for those who might insist upon Australian exceptionalism. Latent fingerprint examiners in Australia use the same method – namely ACE-V – as that employed by their counterparts in the US. They report their conclusions in absolute terms: equating a ‘match’ with positive identification. Australian examiners are also exposed to case information that is not relevant to their analyses. To suggest that the criticisms of these practices, described in detail in the NRC, NIST/NIJ and Campbell reports, do not apply to Australian fingerprint practice is inconsistent with the available evidence.³⁹

C Implications for Trials

In the wake of revelations about the lack of underlying research, and therefore uncertainty about the value of many forensic science and medicine techniques, there seems to be a need to reconsider conventional legal practice as a regulatory mechanism. The failure of lawyers and judges to have unilaterally recognised these problems suggests that trials and appeals have very real limitations when it comes to regulating forensic science and medicine evidence. To the extent that prosecutors and judges disregard (or trivialise or ignore) these issues, criminal justice systems are seriously compromised and very likely to produce inconsistent, and incoherent, responses to incriminating *expert* evidence.

37 Part IV(A) will consider whether trial and appellate safeguards are capable of filling the research void.

38 They should, for example, be able to point to published validation studies and indicative error rates.

39 Interestingly, in the wake of the NIST/NIJ Report, the Federal Bureau of Investigation has begun to restrict information provided to ‘verifiers’ as part of its ACE-V process. See Office of the Inspector General, *A Review of the FBI’s Progress in Responding to the Recommendations in the Office of the Inspector General Report on the Fingerprint Misidentification in the Brandon Mayfield Case* (U.S. Department of Justice 2011) available at <www.justice.gov/oig/special/s1105.pdf> (accessed 6 Nov 2013).

Simultaneously, they threaten the goal of doing justice in the pursuit of truth.⁴⁰ Insufficient attention to the reliability of expert evidence and the effectiveness of trial processes means that legal institutions are very likely to mismanage incriminating expert evidence into the foreseeable future.

While prosecutors in earlier decades might reasonably have claimed ignorance of the deep structural and epistemic problems with many forms of forensic science and medicine, the same cannot be said for prosecutors practicing today. In the wake of authoritative reports and continuing scholarly engagement bearing directly on these issues, today's prosecutors are *on notice*. In assessing, adducing and relying upon forensic science and medicine evidence, they are obliged to be conversant with and attend to the concerns of mainstream scientific organisations and the attentive community of scholars.

III PROSECUTORIAL OBLIGATIONS: WHAT IS REQUIRED OF A 'MINISTER OF JUSTICE'?

[M]ore than any other lawyer, [the prosecutor] must be especially careful to avoid misconduct because as a prosecutor well knows, her comments carry the imprimatur of the government ...⁴¹

In attempting to delineate the primary obligations of a prosecutor this article draws on influential common law expressions manifested in judgments from England, Canada, Australia, the US and supranational organisations.⁴² These formulations, many longstanding, encapsulate the obligations owed by the prosecutor that flow from accusation and the adversarial nature of proceedings. In many jurisdictions they are supplemented by detailed codes or rules and, conspicuously in recent decades, influenced by human rights discourses.⁴³ It is my contention, not that the following argument strictly depends upon it, that the primary professional obligations of the prosecutor are a consequence of his or her privileged position as a representative of the state in conjunction with the objectives of the accusatorial trial – concerned as it is with truth and justice.⁴⁴ Unavoidably, how we understand prosecutorial obligations and performance must depend on what we know about the evidence – and the underlying technique – and the abilities of various legal actors to understand and evaluate it.

40 Hock Lai Ho, *A Philosophy of Evidence Law: Justice in the Search for Truth* (Oxford University Press, 2008).

41 Gershman, above n 4, 35. See also Bennett Gershman, 'The Prosecutor's Duty to Truth' (2001) 14 *Georgetown Journal of Legal Ethics* 309; American Bar Association, 'Prosecution Function' (Criminal Justice Standards, 7 October 2013) Commentary to Standard 3-5.8.

42 See also Fred C Zacharias, 'Structuring the Ethics of Prosecutorial Trial Practice: Can Prosecutors Do Justice?' (1991) 44 *Vanderbilt Law Review* 45; Fred C Zacharias, 'The Professional Discipline of Prosecutors' (2001) 79 *North Carolina Law Review* 721; David Luban, 'The Conscience of a Prosecutor' (2010) 45 *Valparaiso University Law Review* 1.

43 See, eg, Jeremy Gans et al, *Criminal Process and Human Rights* (Federation Press, 2011).

44 See the discussion in John D Jackson and Sarah J Summers, *The Internationalisation of Criminal Evidence: Beyond the Common Law and Civil Law Traditions* (Cambridge University Press, 2012) ch 1.

Decisions about incriminating expert evidence also depend upon the effectiveness of actual (rather than putative) trial and appellate processes. In consequence, they must consider the actual abilities of the decision-maker (whether judge or jury) as well as the effectiveness of safeguards.

Some of the more influential formulations of prosecutorial duties are reproduced below. These convergent judicial expressions tend to reinforce the obligation to act as a ‘minister of justice’ but simultaneously recognise additional obligations and duties that occasionally create practical tensions:

It is true prosecuting counsel ought not to press for a conviction. ... They should ‘regard themselves’ rather as ‘ministers of justice’ assisting in its administration than as advocates.⁴⁵

The United States Attorney is the representative not of an ordinary party to a controversy, but of a sovereignty whose obligation to govern impartially is as compelling as its obligation to govern at all, and whose interest, therefore, in a criminal prosecution is not that it shall win a case, but that justice shall be done. As such, he is in a peculiar and very definite sense the servant of the law, the twofold aim of which is that guilt shall not escape or innocence suffer. He may prosecute with earnestness and vigor – indeed, he should do so. But, while he may strike hard blows, he is not at liberty to strike foul ones. It is as much his duty to refrain from improper methods calculated to produce a wrongful conviction as it is to use every legitimate means to bring about a just one.⁴⁶

It cannot be over-emphasized that the purpose of a criminal prosecution is not to obtain a conviction, it is to lay before a jury what the Crown considers to be credible evidence relevant to what is alleged to be a crime. Counsel have a duty to see that all available legal proof of the facts is presented: it should be done firmly and pressed to its legitimate strength but it must also be done fairly. The role of prosecutor excludes any notion of winning or losing ...⁴⁷

Prosecuting counsel in a criminal trial represents the State. The accused, the court and the community are entitled to expect that, in performing his function of presenting the case against an accused, he will act with fairness and detachment and always with the objectives of establishing the whole truth in accordance with the procedures and standards which the law requires to be observed and of helping to ensure that the accused’s trial is a fair one.⁴⁸

Most jurisdictions have, in addition to such common law formulations, a code or set of guidelines to assist prosecutors understand and manage their multiple obligations and discretions.⁴⁹ In New South Wales these guidelines draw upon and effectively reiterate common law authority:

45 *R v Banks* [1916] 2 KB 621, 623 (Avory J). This approach to ‘advocacy’ seems inconsistent with modern authority. See also *R v Puddick* (1865) 4 F & F 497, 499 (Compton J).

46 *Berger v United States*, 295 US 78, 88 (1935) (Sutherland J).

47 *Boucher v The Queen* (1954) 110 CCC 263, 270 (Rand J) (‘*Boucher*’).

48 *Whitehorn v The Queen* (1983) 152 CLR 657, 663–4 (Deane J).

49 Ellen S Podgor, ‘The Ethics and Professionalism of Prosecutors in Discretionary Decisions’ (2000) 68 *Fordham Law Review* 1511.

A prosecutor is a ‘minister of justice’. The prosecutor’s principal role is to assist the court to arrive at the truth and to do justice between the community and the accused according to law and the dictates of fairness.⁵⁰

Most prosecutors are also subject to bar rules. The New South Wales Barristers’ Rules include:

- Rule 82. A prosecutor must fairly assist the court to arrive at the truth, must seek impartially to have the whole of the relevant evidence placed intelligibly before the court, and must seek to assist the court with adequate submissions of law to enable the law properly to be applied to the facts.
- Rule 83. A prosecutor must not press the prosecution’s case for a conviction beyond a full and firm presentation of that case.
- Rule 84. A prosecutor must not, by language or other conduct, seek to inflame or bias the court against the accused.
- Rule 85. A prosecutor must not argue any proposition of fact or law which the prosecutor does not believe on reasonable grounds to be capable of contributing to a finding of guilt and also to carry weight.
- Rule 88. A prosecutor must call as part of the prosecution’s case all witnesses: (a) whose testimony is admissible and necessary for the presentation of all of the relevant circumstances ...⁵¹

The following provisions, by way of supplementation, are taken from the International Association of Prosecutors’ *Standards of Professional Responsibility and Statement of the Essential Duties and Rights of Prosecutors*:

Prosecutors shall perform their duties without fear, favour or prejudice. In particular they shall:

- (a) carry out their functions impartially; ...
- (c) act with objectivity;
- (d) have regard to all relevant circumstances, irrespective of whether they are to the advantage or disadvantage of the suspect;
- (e) in accordance with local law or the requirements of a fair trial, seek to ensure that all necessary and reasonable enquiries are made and the result disclosed, whether that points towards the guilt or the innocence of the suspect;
- (f) always search for the truth and assist the court to arrive at the truth and to do justice between the community, the victim and the accused according to law and the dictates of fairness. ...

50 Office of the Director of Public Prosecutions (NSW), ‘Prosecution Guidelines of the Office of the Director of Public Prosecutions for New South Wales’ (1 June 2007) Guideline 2. Guideline 3 commences: ‘Having regard to the role and duties of the prosecutor as described in Guideline 2, a prosecutor must act impartially and fairly according to law. This will involve the prosecutor informing the defence and the court of directions, warnings or authorities which may be appropriate in the circumstances of the case, even where unfavourable to the prosecution. It will also involve identifying portions of evidence which may be objectionable and declining to open on such evidence.’ More recently, see *Gilham v The Queen* [2012] NSWCCA 131 (‘*Gilham*’); *Wood v The Queen* [2012] NSWCCA 21 (‘*Wood*’).

51 New South Wales Bar Association, ‘New South Wales Barristers’ Rules’ (15 April 2013). See also Law Society of New South Wales, ‘Professional Conduct and Practice Rules’ (7 October 2013) r A62–72.

Prosecutors shall perform an active role in criminal proceedings as follows: ...

- (d) in the institution of criminal proceedings, they will proceed only when a case is well-founded upon evidence reasonably believed to be reliable and admissible, and will not continue with a prosecution in the absence of such evidence.⁵²

These formulations place a premium on truth (establishing the whole truth and assisting the court to arrive at the truth), justice (to do justice and seeing that justice shall be done) and fairness (according to law and the dictates of fairness). Many of the statements require prosecutors to act objectively, impartially and ‘with fairness and detachment’.⁵³ In theory and practice, if there is doubt about what a prosecutor should do, ‘seeking justice’ should always predominate over adducing or pressing evidence and securing a conviction. Acting as a ‘minister of justice’, the prosecutor is obliged to seek truth fairly. This must mean to prosecute only as vigorously as *the evidence* and *the system* allow. The prosecutor cannot ignore the frailties of the evidence, the actual constraints and limitations of the system, nor the circumstances attending the individual trial (or appeal).

In relation to evidence and proof, there are expectations: ‘that all available legal proof of facts is presented’, ‘to assist the court to arrive at the truth’ and ‘to ensure that the accused’s trial is a fair one.’ The prosecutor’s response to incriminating expert evidence should be driven by the need for both an accurate outcome and a fair process. The more detailed guidelines tend to require, and this would seem particularly apposite to dealing with incriminating expert evidence, that the prosecution should proceed using ‘evidence reasonably believed to be reliable and admissible’.⁵⁴ In *Boucher* this was characterised as using ‘credible evidence ... pressed to its legitimate strength’.⁵⁵ Rule 83 of the New South Wales Barristers’ Rules requires ‘a full and firm presentation of [the] case’. The International Association recommends that ‘all necessary and reasonable enquiries are made and the results disclosed’ – whether they point ‘towards the guilt or the innocence of the suspect’.⁵⁶ Prosecutors are responsible for the integrity of proof. While concerns other than conviction should motivate their performance, they carry the burden of removing all reasonable doubts about the guilt of the accused.

Crucial to the operation of the accusatorial trial, particularly in a system purporting to be rational, the tribunal of fact (and trial and appellate judges)

52 International Association of Prosecutors, ‘Standards of Professional Responsibility and Statement of the Essential Duties and Rights of Prosecutors’ (7 October 2013) statements 3, 4.

53 Samuel Levine, ‘Taking Prosecutorial Ethics Seriously: A Consideration of the Prosecutor’s Ethical Obligation to “Seek Justice” in a Comparative Analytical Framework’ (2004) 41 *Houston Law Review* 1337.

54 See American Bar Association, ‘Model Rules of Professional Conduct’ (7 October 2013) r 3.8.

55 *Boucher* (1954) 110 CCC 263, 270 (Rand J).

56 International Association of Prosecutors, above n 52, statement 3. See also Gershman, above n 4, 28. Gershman explains that ‘nondisclosure, or incomplete or untimely disclosure, is often aggravated by the inability of a defendant to challenge effectively the scientific evidence that the prosecutor presents to the jury’: at 28.

‘must be capable of understanding *and* evaluating all evidence and any disagreement – however complex or technical – with which it is presented.’⁵⁷ In consequence, the prosecutor has a non-revocable obligation to set out both the incriminating expert evidence and its limitations in a manner that is simultaneously accurate and comprehensible to lay persons. Obligated to act with fairness and detachment, to make enquiries and disclose results, and present the case fully, prosecutors must not transfer the obligation to explain incriminating expert evidence and its limitations to the judge or the accused – via his defence lawyer. The failure to identify, disclose and explain limitations with expert evidence is inconsistent with the goals of truth and justice, inconsistent with the responsibilities of a minister of justice, and seems to have a subversive tendency to shift the burden of proof and/or discount proof beyond reasonable doubt.

It is useful to reflect on these generic formulations, both the injunctions of appellate courts and the more particularised bar rules and guidelines, in the light of recent revelations about the forensic sciences. This exercise (developed in Part IV), particularly the conspicuous failure to appreciate, and proactively disclose, evidentiary weaknesses, suggests that prosecutorial obligations need rethinking. It is not safe to assume that the defence and the trial judge will compensate for the omissions and failures of the prosecutor (and *expert* witnesses). Prosecutorial obligations, with respect to forensic science and medicine, are being interpreted via traditional practice with its implicit faith in both the expert evidence and adversarial trial mechanisms.⁵⁸

Before moving to consider prosecutorial obligations in light of the overarching commitment to truth and justice, it is worth reflecting on the role and value of expert evidence that is unreliable or speculative (that is, of unknown reliability) in the accusatorial trial. There is no place in a rational system of criminal prosecution for forensic science and medicine that is not demonstrably reliable. This would seem incontrovertible in jurisdictions that actually require expert evidence to be relevant and reliable (for example, in Canada and US federal courts), but it would also seem to provide the most serviceable guide to prosecutors in jurisdictions where admissibility standards – and the interpretation of prosecutorial responsibilities – are lax.⁵⁹

In the US, where DNA exonerations have exposed widespread problems with prosecutorial practices (and recalcitrance, extending beyond conviction), forensic

57 Ronald J Allen and Joseph S Miller, ‘The Common Law Theory of Experts: Deference or Education’ (1993) 87 *Northwestern University Law Review* 1131; Gary Edmond and Andrew Roberts, ‘Procedural Fairness, the Criminal Trial and Forensic Science and Medicine’ (2011) 33 *Sydney Law Review* 359, 372 (emphasis in original).

58 The evidence seems to suggest that ‘otherwise conscientious prosecutors ... fail to screen out weak scientific evidence at the front end of the process’: Daniel Medwed, *Prosecution Complex: America’s Race to Convict and Its Impact on the Innocent* (NYU Press, 2012) 98.

59 Notwithstanding the need, in many jurisdictions (including New South Wales), for the opinion to be based on ‘knowledge’ or ‘specialised knowledge’. On lax admissibility standards, see the Law Commission (UK), *Expert Evidence in Criminal Proceedings in England and Wales*, Report No 325 (2009), [3.3] and [6.10].

science evidence and the limited value of trial safeguards and appeals in cases where those convicted were factually innocent, prosecutors and judges have been repeatedly criticised for their reliance on insufficiently reliable forensic science and medicine evidence.⁶⁰

[P]rosecutors, by using unreliable forensic evidence and questionable expert witnesses, and judges, by failing to exercise their gatekeeping role in a sufficiently diligent manner, have become part of the mechanism by which misconceptions occur.⁶¹

Responding to *Daubert v Merrell Dow Pharmaceuticals* ('*Daubert*') and the revised *Federal Rules of Evidence* (US), several (American) scholars have insisted that prosecutors should attend to the reliability of incriminating expert evidence.⁶² Moriarty, for example, proposes that expert evidence should not be adduced if there is 'a factual basis to believe that the proposed evidence is incorrect, inaccurate, incomplete, misleading ... or without solid foundation'.⁶³ Raeder endorses Saks' proposal for attention to validity and a reasonable good faith belief in reliability – a 'good faith basis for believing'.⁶⁴ Giannelli and McMunigal propose supplementing the (US) Model Rules with an obligation preventing prosecutors from 'knowingly, recklessly, or negligently offering false scientific evidence'.⁶⁵

In contrast to the approach advanced in this article, most of these proposals call for more detailed rules and more stringent review of prosecutorial discretions.⁶⁶ However, it is not merely a matter of identifying limitations because, in many cases, the value of the evidence is uncertain precisely because analysts have not undertaken the requisite studies. In many, perhaps most, cases we have no idea about the value of techniques or opinions. Identifying and

60 Brandon L Garrett, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong* (Harvard University Press, 2011).

61 Jane Campbell Moriarty, "'Misconceptions,'" Science and the Ministers of Justice' (2007) 86 *Nebraska Law Review* 1, 3. The author defines 'misconceptions' as 'the miscarriage of justice when an innocent person is convicted': at 2.

62 *Daubert v Merrell Dow Pharmaceuticals*, 113 S Ct 2786, 2798 (1993). *Daubert* and most of the subsequent US federal admissibility jurisprudence were civil appeals. See also *General Electric Co v Joiner*, 522 US 136 (1997); *Kumho Tire Co v Carmichael* 526 US 137 (1999). On differences between civil and criminal justice, see Gary Edmond and Mehera San Roque, 'Just(,) Quick and Cheap: Do We Need More Reliable Expert Evidence in Civil Proceedings?' in Michael Legg (ed), *The Future of Dispute Resolution* (LexisNexis, 2013) 72.

63 Moriarty, above n 61, 29.

64 Myrna Raeder, 'See No Evil: Wrongful Convictions and the Prosecutorial Ethics of Offering Testimony by Jailhouse Informants and Dishonest Experts' (2007) 76 *Fordham Law Review* 1413, 1450. See also Michael J Saks, 'Scientific Evidence and the Ethical Obligations of Attorneys' (2001) 49 *Cleveland State Law Review* 421, 426.

65 Paul C Giannelli and Kevin C McMunigal, 'Prosecutors, Ethics and Expert Witnesses' (2007) 76 *Fordham Law Review* 1493, 1535. This proposal, less formal, extends to evidence of unknown reliability (not just unreliable or false evidence).

66 Medwed, above n 58, for example, calls for 'modest legal, ethical, and institutional reforms': at 165. See also Fred C Zacharias, 'Specificity in Professional Responsibility Codes: Theory, Practice, and the Paradigm of Prosecutorial Ethics' (1993) 69 *Notre Dame Law Review* 223; Ellen Yaroshefsky, 'Wrongful Convictions: It Is Time to Take Prosecution Discipline Seriously' (2004) 8 *University of the District of Columbia Law Review* 275.

explaining methodological limitations does not somehow enable a decision-maker to rationally evaluate incriminating opinion. Merely disclosing and explaining limitations is unlikely to cure the risk of error and unfair prejudice.

In the absence of appropriate studies and research, neither the NRC nor any other scientific organisation or attentive commentator has suggested that we should admit evidence and leave ordinary citizens to work out the value of the techniques and derivative opinions based on what transpires at trial. While explaining limitations and notorious risks, such as the biases that can flow from exposing analysts to gratuitous information, might put the value of the incriminating opinion evidence in a clearer light, this illumination cannot overcome the fundamental obligation on the state to evaluate the techniques it relies upon, especially where these are used routinely. Evidence should be produced using processes that eliminate (or reduce) notorious risks. Where techniques have not been evaluated, and notorious dangers ignored, it is inappropriate for lawyers, judges or jurors to speculate about the meaning and value of the derivative opinions at trial. Where there are doubts, the commitment to truth and the fair (that is, 'full and frank' or 'warts and all') presentation of expert evidence, including the identification and explanation of methodological deficiencies, should override strategic (and selective) representations that might advance the prosecution's case (and the chance of victory) while disadvantaging the accused both procedurally and substantially. If in doubt, or where there is little or no experimental evidence substantiating a technique or opinion, prosecutors should not lead the incriminating expert evidence.

Whatever the prosecutor does, she should not partake in activities that are likely to subvert fact-finding in a manner detrimental to the accused or partake in activities that might produce substantial unfairness. This article approaches prosecutorial obligations on the basis that there is a non-derogable obligation to fairly present incriminating expert evidence. That obligation falls squarely on the state, and therefore the prosecutor (and indirectly the judge). A fair proceeding, and a proceeding that is concerned with rectitude through the elimination of reasonable doubts, is obliged to have expert evidence presented in a manner that enables the tribunal of fact to rationally evaluate it.

It is premature, at this stage, to confidently answer the question of whether existing frameworks and guideline (rules and codes) will be adequate to the challenge. What we can say is that insufficient attention has been directed to them, given the dramatic changes to our understanding of the value of many forms of forensic science and medicine evidence. The remainder of this article attends to some of the emerging issues and how they might impact on prosecutorial performance.

IV OBLIGATIONS IN CONTEXT: RETHINKING PROSECUTORIAL RESPONSIBILITIES AND DUTIES

This section endeavours to encourage prosecutors to think about their obligations in relation to what we know about the forensic sciences and ordinary

criminal justice practice rather than persisting with traditional assumptions and beliefs.

Reflecting on this revised approach to conventional prosecutorial obligations one issue stands front and centre. Presenting forensic science and medicine evidence in ways that endeavour to convey the actual value of the evidence could hardly be thought to be an unreasonable imposition on a ‘minister of justice’.⁶⁷

A Adduction and Trial Safeguards

Unreliable, weak and speculative forensic science and medicine evidence would be far less of a problem if trial mechanisms consistently *identified and conveyed* limitations with expert evidence.⁶⁸ Unfortunately, the rules regulating the trial along with the range of trial safeguards (that is, mostly protections for the accused) seem to be weak (or weakly applied), and are often ineffective in relation to expert evidence. Notwithstanding the need to identify and convey infirmities to facilitate the rational assessment of evidence (and guilt), the kinds of problems with expert evidence identified in the various reports are neither systematically identified nor explained in courtrooms. Indeed, the identification and explanation of evidentiary infirmities occurs so haphazardly and infrequently that the phrases ‘admissibility standards’ and ‘trial safeguards’ might reasonably be considered misnomers.⁶⁹ Admissibility rules, trial safeguards, jury participation and scope for appellate review, currently afford much more limited protection than safeguards genuinely indexed to truth and justice ought to provide.

One of the clearest expressions of doubt about traditional trial safeguards (outside the NRC Report) can be found in a recent report, *Expert Evidence in Criminal Proceedings in England and Wales*, in which the Law Commission of England and Wales concluded:

Cross-examination, the adduction of contrary expert evidence and judicial guidance at the end of the trial are currently assumed to provide sufficient safeguards in relation to expert evidence ... However, ... it is doubtful whether these are valid assumptions.⁷⁰

67 It may have resource and competency implications, but these are separate issues. See generally, Peter A Joy, ‘The Relationship between Prosecutorial Misconduct and Wrongful Convictions: Shaping Remedies for a Broken System’ (2006) 2006 *Wisconsin Law Review* 399, 407.

68 There is also the problem of lay decision-making in legal contexts. This is not simply a question of jury (and judicial) competence, but the more complex issue of evaluating evidence in circumstances that are not always conducive to decision-making. This includes restricted exposure to information, limited ability to ask questions, inability to consult additional materials or discuss beyond the jury and so on. See Alan Irwin and Brian Wynne (eds), *Misunderstanding Science? The Public Reconstruction of Science and Technology* (Cambridge University Press, 1996).

69 Claims that trials are effective can be refuted by the routine failure to identify or concede the kinds of concerns identified by the NRC Committee. Where are the judicial references to the failure to undertake validation studies and proficiency tests, the significance of not having access to error rates, the way that analysts have exaggerated their abilities, the potentially corrosive potential of contextual factors and biases, cautious approaches to experience and confidence, and so on?

70 Law Commission, above n 59 at [1.20].

This assessment is consistent with the work of innocent projects, criminal cases review commissions and my own observations of criminal trials and appeals in Australia.⁷¹ It is also consistent with the NRC Report, insofar as common law legal systems have allowed unreliable and speculative evidence into trials for decades on the erroneous assumption that techniques are inherently reliable and/or that any limitations will be exposed (or disclosed) and clearly explained.⁷²

Trial safeguards, particularly in the way they have traditionally been understood and resourced, are not sufficient to deal with unreliable, speculative and ‘shaky’ forms of expert evidence.⁷³

B Admissibility Standards

The responsibilities of prosecutors are not necessarily fulfilled by adherence to conventional practice or the satisfaction of adjectival rules. Admissibility standards governing expert evidence are a good example. ‘Weak forensic evidence’, as Medwed notes, ‘continues to pour, not drip, into criminal trials’.⁷⁴ Medwed is concerned with practice in the US in the aftermath of *Daubert*. Similar problems persist in Canada in the aftermath of *R v Trochym*,⁷⁵ and will no doubt continue to haunt English practice even if the draft Criminal Evidence (Experts) Bill, requiring expert opinion evidence to be ‘sufficiently reliable’, is eventually enacted.⁷⁶ Australian admissibility jurisprudence is largely inattentive to the reliability of techniques. Our judges have preferred to focus their attention on less informative heuristics such as the existence of a ‘field’, formal qualifications, the experience of the analyst and tortured inquiries into the (admissibility of) facts underlying the opinion.⁷⁷

Accommodating responses to expert evidence reflect the belief that questions of reliability and probative value are the exclusive province of the jury – issues of weight to be determined at trial. The problem, of course, is that very often

71 See also Keith A Findley, ‘Innocents at Risk: Adversary Imbalance, Forensic Science, and the Search for Truth’ (2008) 38 *Seton Hall Law Review* 893; Garrett, above n 60.

72 NRC Report, above n 12, 85.

73 See Gary Edmond and Mehera San Roque, ‘The Cool Crucible: Forensic Science and the Frailty of the Criminal Trial’ (2012) 24 *Current Issues in Criminal Justice* 51. The term ‘shaky’ is taken from *Daubert* 113 S Ct 2786, 2798 (1993), where the US Supreme Court explained that ‘[v]igorous 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’: at 2798 (emphasis added). The Court simultaneously characterised concerns about ‘the capabilities of the jury and of the adversary system generally’ as ‘overly pessimistic’: at 2798.

74 Medwed, above n 58 at 102.

75 [2007] 1 SCR 239. See Gary Edmond et al, ‘Admissibility Compared: The Reception of Incriminating Expert Opinion (ie, Forensic Science) Evidence in Four Adversarial Jurisdictions’ (2013) 3 *University of Denver Criminal Law Review* 31.

76 See Gary Edmond, ‘Is Reliability Sufficient? The Law Commission and Expert Evidence in International and Interdisciplinary Perspective’ (2012) 16 *International Journal of Evidence and Proof* 30.

77 See generally *Clark v Ryan* (1960) 103 CLR 486; *R v Bonython* (1984) 38 SASR 45; *HG v The Queen* (1999) 197 CLR 414; *Veleviski v The Queen* (2002) 187 ALR 233; *Dasreef Pty Ltd v Hawchar* (2011) 85 ALJR 694.

limitations with expert evidence are neither identified nor conveyed during the course of proceedings. Widespread legal ignorance of the methodological problems with fingerprint comparisons, along with the failure to require analysts to disclose limitations, shield themselves from gratuitous information, and express their conclusions in scientifically defensible terms, represent conspicuous examples of such oversights.

Satisfying the often misguided, and frequently undemanding, (interpretation of) thresholds regulating the admission of incriminating expert evidence neither fulfills nor ends prosecutorial responsibilities. Regardless of whether there is a formal admissibility standard stipulating ‘reliability’, the prosecutor should be attentive to the reliability (or value) of incriminating expert evidence as well as its potential to mislead.⁷⁸ The prosecutor should not, as a minister of justice, adduce insufficiently reliable evidence or permit forensic science and medicine evidence to be presented in terms stronger than empirical evidence will (or would) allow. The trial and trial safeguards – and their *potential* to address evidentiary infirmities – do not relieve the prosecutor of these fundamental responsibilities. Where there are serious doubts about opinions, and limited empirical support for techniques, prosecutors should not – regardless of historical practices – adduce the evidence. Accusatorial systems and adversarial mechanisms have repeatedly shown themselves incapable of responsibly handling unreliable, ‘shaky’ and speculative forms of incriminating expert evidence.⁷⁹

In this context it is important to acknowledge that there will be cases where the reliability of techniques and derivative opinions is open to reasonable disagreement.⁸⁰ In such cases, in good faith, the prosecutor would seem obliged to unilaterally identify substantial limitations (and credible criticism) if they decide to lead the evidence.⁸¹ In all cases prosecutors should not wait for the defence to object before drawing the court’s attention to issues that bear on the admissibility or evaluation of incriminating expert evidence. In practice, the prosecutor should not simply promote the positive case and leave the defence to contest admissibility and expose limitations. Where the prosecutor has a reasonable belief that the techniques are reliable and there is evidence to support that contention, then they might lead the evidence but only on condition that any presentation is ‘warts and all’ *and* the defence is able to make submissions or call appropriate witnesses.

78 It does not matter that the jury may have ultimate decision-making responsibility, prosecutors and judges should attend to the probative value of incriminating expert opinion evidence.

79 Desirable as *reliability* seems to be – as a prophylactic capable of eliminating the worst of the problems with incriminating expert evidence – it has not been widely embraced by prosecutors (or judges), even in jurisdictions with explicit reliability-based admissibility standards to inform their practice. See David S Caudill, ‘Lawyers Judging Experts: Oversimplifying Science and Undervaluing Advocacy to Construct an Ethical Duty?’ (2011) 38 *Pepperdine Law Review* 675; Gary Edmond, ‘Pathological Science? Demonstrable Reliability and Expert Pathology Evidence’ in Kent Roach (ed), *Pediatric Forensic Pathology and the Justice System* (Queen’s Printer for Ontario, 2008).

80 See Caudill, above n 79.

81 See, eg, *The General Medical Council v Meadow* [2006] EWCA Civ 1390, [206].

Where state laboratories and forensic analysts have not undertaken appropriate (or necessary) evaluation of their techniques, and thereby developed appropriate standards and empirically predicated terms for expressing opinions, the prosecutor cannot ignore, and should be reluctant to excuse, such oversights.⁸² The prosecutor is obliged to take these omissions into account when considering whether to lead expert evidence. Where evidence has not been assessed, and where notorious methodological vulnerabilities, such as exposing analysts to gratuitous though prejudicial information persist, it may be that the evidence has little or even no probative value (and is therefore logically irrelevant) regardless of how it might be represented (or was historically presented) at trial.

C Exclusionary Discretions

Prosecutors should pay attention to the risk of unfair prejudice (to the accused) in addition to formal admissibility standards.⁸³ If the probative value of the evidence is low then the risks of unfair prejudice will often be considerable. Where the probative value of the evidence is unknown there are serious risks that limits will not be clearly conveyed and that the evidence will be misunderstood and/or over-valued.

While the jury has discretion in the manner in which it approaches expert evidence and combines it with other evidence, a rational trial process cannot ignore the need to provide the decision-maker with information about ability and accuracy. Moreover, a jury should not be entitled to attribute any weight it deems appropriate to an expert's opinion – especially if there are validation studies and indicative error rates.⁸⁴ The probative value of an opinion must be constrained (certainly at the most probative end) by evidence of the value and accuracy of techniques.⁸⁵ The absence of such information should raise cautionary flags; signaling the need for serious consideration around whether expert evidence

82 See Special Issue, above n 11.

83 In many jurisdictions there may be additional obligations to attend to waste of time, resources and the risk of confusion.

84 Because the probative value of many techniques can be gauged – even if in some range – prosecutors and judges should not allow a jury to assign to the evidence (almost) any value. Generally, interpretations should be guided by validation studies and indicative error rates. This point is inconsistent with judicial approaches in NSW (see, eg, *R v Shamouil* (2006) 66 NSWLR 228), but unconstrained deference to the jury is unsustainable and irrational. The danger of jurors over-valuing unreliable, speculative and even weak (that is, error-prone) expert opinion evidence provide grounds for exclusion via mandatory and discretionary exclusions (see, eg, *Evidence Act 1995* (NSW) ss 135, 137) and possibly under admissibility rules (see, eg, *Evidence Act 1995* (NSW) s 79). In *Dupas v The Queen* [2012] VSCA 328 five judges of the Supreme Court of Victoria insisted that trial judges should consider the reliability of incriminating evidence (including expert evidence) when weighing probative value against the danger of unfair prejudice under s 137. Contrast the approach in the New South Wales Court of Criminal Appeal in *R v XY* [2013] NSWCCA 121. See also 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.

85 On the ability of the jury to cope with expert disagreement and uncertainty, see *R v Matthey* (2007) 17 VR 222.

should be adduced and how it should be presented. If the jury is unlikely to appreciate, or is incapable of appreciating, limitations with techniques and opinions then the benefit of reasonable doubt may be lost.

The obligation not to lead (and for judges to exclude) insufficiently reliable expert evidence is especially important because the persuasive burden is on the party adducing the evidence. Relying on exclusionary discretions shifts the onus to the party challenging admission. Given the need to present evidence fairly, in conjunction with a fair process, prosecutors should not exploit low admissibility standards thereby shifting responsibility for unpacking (un)reliability onto the accused. The accused should not bear the risk of systematic failures to evaluate techniques (and proficiency) or the risk of jury misunderstanding or over-valuing the evidence when it is presented at trial. The accused should not be obliged to prove that ‘shaky’ techniques are in fact ‘shaky’.

D The Courtroom Does Not Provide a Serious Test of Scientific and Medical Evidence

Techniques should be formally assessed prior to adduction in criminal proceedings.⁸⁶ Trials do not provide a credible assessment of new, emerging or impugned techniques. Where experts (and lawyers) appeal to earlier accommodating admissibility decisions and previous convictions as evidence of the reliability of techniques and opinions they are making a category error.⁸⁷

Techniques in routine use should be evaluated to determine whether they do what analysts claims as well as their accuracy. Analysts should be proficient and preferably experienced with techniques that have been evaluated. Evaluation should be independent – separate from litigation and the courtroom. While the criminal trial might on occasion hold experts to account, it is not a real test and is not the equivalent of independent empirical evaluation.⁸⁸ Admissibility decisions and success withstanding cross-examination often tell us more about admissibility standards, the resourcing and competence of lawyers and judges, than they reveal about the value of techniques and derivative opinions.

E Experience Does Not Equate to Reliability

The experience of analysts, their previous appearances in court and the widespread use of techniques – across jurisdictions, agencies and time – are often used to justify the admission and reliance placed on incriminating opinions.

86 This is similar to what Foster and Huber advocated in the sphere of civil litigation in Kenneth Foster and Peter Huber, *Judging Science: Scientific Knowledge and the Federal Courts* (MIT Press, 1997). The underlying principles are, however, much clearer and more persuasive in the criminal justice context, given higher levels of consensus around the espoused goals.

87 A notorious example is *United States v Harvard*, 117 F Supp 2d 848 (SD Ind, 2000).

88 See Sheila Jasanoff, *Science at the Bar: Law, Science and Technology in America* (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. Cf Gary Edmond, ‘The Building Blocks of Forensic Science and Law: Recent Work on DNA Profiling (and Photo Comparison)’ (2011) 41 *Social Studies of Science* 127.

Experience is useful once a technique has been assessed so that we have an idea of the value of the experience and how practices might be refined to improve performance. Experience alone is generally incapable of validating a technique. Similarly, prior convictions and experience do not validate techniques – see Part IV(D).

In most areas of forensic science and medicine, and especially in relation to techniques that are in routine use, experience should not be used to ground admissibility. Even though most admissibility rules make an exception to the exclusionary approach to opinion evidence for opinions based on ‘experience’, unambiguous scientific research confirms that experience is generally incapable of grounding techniques and can be misleading.⁸⁹ Where techniques can be evaluated experimentally, they should be.

Contesting the value of experience at trial can be challenging. It is difficult to effectively explain the limits of experience, particularly where the confident analyst is a very experienced investigator who has used the impugned technique, and been allowed to express untested opinions, for years and perhaps decades. In such cases, defence challenges tend to appear (and are often portrayed by prosecutors as) implausible, self-serving and desperate. The important issue is expertise, not experience. Experience, even long experience, is a poor substitute for independent evidence of actual ability and accuracy.

F On Notice

Prosecutors should be asking forensic analysts for evidence about the validity and reliability of techniques. They should expect to see, and insist upon, references to published validation studies in expert reports – see Part IV(N). In the absence of such evidence and good faith attempts by witnesses to respond to substantial challenges in earlier trials, and scholarly critiques, prosecutors should be very cautious about adducing their opinions.⁹⁰

Prosecutors, especially those in jurisdictions where they form part of an office or service, should maintain files documenting the techniques and individuals that require careful consideration before they are called upon.

G Prosecutors Must Disclose and Explain Serious Limitations with Expert Evidence

Notwithstanding the ability (at least in theory) of the defence to call rebuttal experts, in many cases the need to call such witnesses should be pre-empted by

89 See, eg. Daniel Kahneman, Paul Slovic and Amos Tversky (eds), *Judgment under Uncertainty: Heuristics and Biases* (Cambridge University Press, 1982); Daniel Kahneman and Gary Klein, ‘Conditions for Intuitive Expertise: A Failure to Disagree’ (2009) 64 *American Psychologist* 515.

90 See above nn 5, 6.

the prosecutor's 'full and frank' presentation of any incriminating expert evidence it intends to rely upon.⁹¹

It is simply not good enough for a 'minister of justice' to adduce opinions that are not demonstrably reliable, or do not include or respond to notorious limitations and criticisms, without disclosing that information. It is not, and should not be, the responsibility of the defence to identify and explain limitations with the practices and interpretations of forensic analysts, especially where techniques have been repeatedly criticised by authoritative multidisciplinary committees. The defence should only be obliged to respond to an even-handed (or 'impartial') presentation of incriminating expert evidence that includes explanation of non-trivial problems and limitations. The need for disclosure, along with the ability to explain limitations and oversights, should influence the decision to adduce incriminating expert evidence and will substantially reduce the need for the defence – whether or not they can afford it and regardless of whether such assistance is available to them – to adduce rebuttal expert evidence.⁹²

In *Gilham*, the Court of Criminal Appeal was highly critical of the decision not to call a senior medical pathologist because his opinions, about the significance of multiple stab wounds, were inconsistent with the case advanced by successive prosecutors. The Court explained:

[T]he decision not to call Professor Cordner was made because the Crown had assessed that he was 'plainly unreliable.' ...

[I]t was, in part, expressly based on the fact that he held a different opinion from that advanced by the witnesses the Crown intended to call. The Crown is simply not entitled to discriminate between experts, in particular between those whose views they have sought, calling only those that advance the Crown case ...

The failure to call Professor Cordner to give evidence that in his opinion that analysis [by other medical experts] lacks a legitimate scientific foundation constitutes a miscarriage of justice.⁹³

The other medical witnesses called by the Crown, had not 'undertaken any study ... or ... utilised any body of research into, the characteristics or patterns of stab wounds in multiple homicides'.⁹⁴ Professor Cordner was the only pathologist to direct his attention to the incidence of stab wounds in homicide cases by reviewing dozens of files. He is, in addition, a highly respected and internationally renowned forensic pathologist. The characterisation of his empirically-based critical insights as 'unreliable' was without foundation and

91 David Plater, 'The Development of the Prosecutor's Role in England and Australia with Respect to Its Duty of Disclosure: Partisan Advocate or Minister of Justice?' (2008) 25 *University of Tasmania Law Review* 111.

92 In many areas, such as latent fingerprint examination or ballistics for example, there is no ready supply of non-aligned 'experts' available to the defence. Moreover, where techniques have not been evaluated (but could have been) it is undesirable to have persons whose abilities are unknown appearing for the various parties and disagreeing during adversarial proceedings. See, eg, *Honeysett v R* [2013] NSWCCA 135, [62] and *R v Dastagir* [2013] SASCFC 109, [53].

93 *Gilham* [2012] NSWCCA 131, [394]–[412], [351] ff, [383] ff.

94 *Ibid* [341].

improper. According to the Court, the prosecutor was obliged to call this evidence and the failure to do so constituted a miscarriage of justice.

The obligation to explain limitations should expose the prosecutor to the fact that many forensic science and medicine techniques have not been evaluated and a good deal of analysis is undertaken by individuals with few formal qualifications and without systematic experience. While such analysts *may* have formidable abilities they may not be in a position to identify and explain cognitive, methodological and statistical problems with their practices and operating assumptions. Latent fingerprint examiners are a good example. While recent research confirms their ability to discriminate between prints (making relatively few errors), their historical claims about a match being the equivalent of positive identification and the technique being infallible are, as the NRC and two subsequent inquiries concluded, ‘unrealistic’.⁹⁵ If assistance is required to explain the limitations with latent fingerprint evidence it may be that fingerprint examiners are unable (or unwilling) to respond. In such circumstances it will be incumbent on the prosecutor to call the evidence of cognitive scientists or statisticians to facilitate jury understanding of the magnitude of problems with the evidence.⁹⁶

The disclosure of limitations should be required for admissibility. It should not, however, guarantee admissibility. Expert evidence should be sufficiently reliable for admission, and susceptible to presentation in a manner such that limitations can be explained at trial and rationally evaluated within trial and appeal constraints, before the prosecutor adduces it. Merely conceding oversights, such as the failure to validate, should not provide a backdoor to the courtroom.⁹⁷

H Expert Rebuttal Evidence Adduced by the Defence

Scholars have noted that judges, regardless of admissibility standards, are often more critical and exclusionary in their response to expert evidence adduced on behalf of the accused than evidence adduced by prosecutors.⁹⁸ This may be a result of the effective monopoly maintained by the state in relation to many forms of technical practice (for example, fingerprint evidence and ballistics), it may reflect confidence vested in the experience of the state’s forensic analysts (though see Part IV(E)), it may be a result of more trial judges having been prosecutors than defence lawyers, it may be a result of the (poor) quality of expert evidence adduced by the defence, and it may be a result of the relative

95 NRC Report, above n 12, 143.

96 Though even here there may be difficulties, see Kristy Martire et al, ‘The psychology of interpreting expert evaluative opinions’ (2013) 45 *Australian Journal of Forensic Sciences* 305.

97 Contrast the English approach in *R v Atkins* [2009] EWCA Crim 1876; *Otway v The Queen* [2011] EWCA Crim 3; *R v Dlugosz* [2013] EWCA Crim 2.

98 Michael Risinger, ‘Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?’ (2000) 64 *Albany Law Review* 99; 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. See, eg, *R v Madigan* [2005] NSWCCA 170.

competence of, and resources available to, prosecutors relative to defence lawyers. It may be a combination of these and other factors.

Regardless, prosecutors should be cautious when challenging the admissibility of rebuttal expert evidence adduced by the defence. Generally, where a defence expert is making a methodological or technical challenge, prosecutors should not seek to unfairly trivialise the issue. Similarly, prosecutors should be reluctant to prevent the defence from calling rebuttal experts from *relevant* fields. The fact that they are research scientists, often from fields or disciplines different to the forensic analysts presenting the state's incriminating opinion evidence, should make little material difference.⁹⁹ We should not forget that the vast majority of the (many) problems with forensic science and medicine in recent decades – including the need to refine DNA processing, interpretation and reporting – were identified by those who were not practicing forensic analysts.¹⁰⁰ Most of the criticisms, subsequently endorsed by the NRC and other independent bodies, were first identified and explained by attentive scholars.¹⁰¹ The significance of these problems was often downplayed by forensic practitioners, and their professional associations, and discounted by courts.

Presenting incriminating expert evidence fairly will often require that the defence be allowed to adduce critical evidence from other species of expert. While scope for rebuttal tends to be conceived as important – in many adversarial contests – we should not assume that allowing (or expecting) the defence to rebut the opinions of experienced investigators represents an effective way to facilitate the evaluation of expert evidence. Similarly, the possibility of the defence calling rebuttal evidence should not be used to warrant the admission of insufficiently reliable incriminating opinion evidence.¹⁰² Forensic science and medicine evidence, adduced by the prosecutor and admitted by the trial judge, is very likely – regardless of its actual value – to exert a much stronger influence on decision-makers than methodological criticisms, often technical in nature, adduced by the defence.

I Ability to Identify, Explain and Convey Limitations to the Tribunal of Fact (and Basis)

When adducing and presenting incriminating expert evidence the prosecutor must realistically consider the ability of the jury to understand and assess the

99 Cf *R v Weller* [2010] EWCA Crim 1085. See also Simon A Cole, 'A Cautionary Tale about Cautionary Tales about Intervention' (2009) 16 *Organization* 121.

100 See Jay Aronson, *Genetic Witness: Science, Law, and Controversy in the Making of DNA Profiling* (Rutgers University Press, 2007); David H Kaye, *The Double Helix and the Law of Evidence* (Harvard University Press, 2010).

101 See above n 5.

102 The ability of the defence to obtain or afford independent advice does not alter this fundamental obligation. Should speculative, marginal or misleading opinions be adduced by the defence the prosecutor is usually well positioned to expose their vulnerabilities given the trial structure and relative resourcing.

evidence.¹⁰³ This will often require confidence that the jury will appreciate that the forensic science and medicine evidence is not independent of other evidence and should be used cautiously as corroboration.

The analytical and reasoning process, as well as the basis for the opinion, should be transparent or capable of being made transparent.¹⁰⁴ Careful consideration should also be given to the forms of expression. Greater transparency may well reveal or expose limitations and errors.¹⁰⁵ Greater attention to the lay assessment of evidence, particularly empirically derived probabilistic forms of expression, should improve fact-finding. Prosecutors should carefully consider the way that experts express their opinions. They should aim to avoid misleading impressions and to maximise comprehension by decision-makers.¹⁰⁶

J Admissibility Compromises

Prosecutors should generally be reluctant to obtain admission for unreliable and speculative techniques and opinions on the basis of admissibility compromises – that effectively restrict what the expert is allowed to say.¹⁰⁷ The problem with admissibility compromises, such as where an analyst comparing CCTV images of an offender with reference photographs of the accused is restricted to describing similarities and proscribed from making a positive identification (even though they believe they can), is that the compromises are not based on any independent evidence of ability.¹⁰⁸ This is why underlying research, such as validation studies, is fundamental. Studies provide information on performance and limitations, and assist with the formulation, expression and evaluation of opinion evidence. In the absence of such studies expression is speculative and may be impenetrable *ipse dixit*.¹⁰⁹

Restricting opinions to points of similarity is not particularly useful if the analyst does not have an effective method to determine whether features are in fact similar or a method to determine how common (or independent) features are in particular populations.¹¹⁰ In addition, compromises around what the expert is allowed (by prosecutors and judges as opposed to underlying research) to say at

103 See, eg, *Gilham* [2012] NSWCCA 131, [405]: ‘It is in the discharge of the different but allied obligations of the expert and the Crown Prosecutor that the jury is educated and informed about matters in issue between the Crown and the accused which are beyond the jury’s experience.’

104 See *Dasreef Pty Ltd v Hawchar* (2011) 85 ALJR 694.

105 Attention should, therefore, be paid the manner in which opinion evidence and its foundations are presented in reports and testimony. See, eg, *HG v The Queen* (1999) 197 CLR 414; *Makita (Australia) Pty Ltd v Sprowles* (2001) 52 NSWLR 705; *R v Morgan* [2011] NSWCCA 257.

106 They should not, for example, invoke the decision in *Aytugrul v The Queen* [2012] HCA 15 as a resource that enables them to disregard the issue of jury comprehension.

107 Simon Cole, ‘Splitting Hairs? Evaluating “Split Testimony” as an Approach to the Problem of Forensic Expert Evidence’ (2011) 33 *Sydney Law Review* 459.

108 See, eg, *R v Tang* (2006) 65 NSWLR 681.

109 See *Pan Pharmaceuticals Limited (in liq) v Selim* [2008] FCA 416.

110 National Research Council Committee on DNA Technology in Forensic Science, *DNA Technology in Forensic Science* (National Academies Press, 1992) 74.

trial are practically difficult to manage, especially if the expert does not personally accept the limitations. Restrictions on expression, particularly in the testimony of the analyst and in closing addresses, are not infrequently subverted.¹¹¹ Even adherence to pre-negotiated formulations does not prevent prosecutors and witnesses from conveying an alternative significance, albeit sometimes implicitly. These difficulties are compounded by the fact that there is no simple correlation between the terms lawyers, judges and experts select to convey the significance of the evidence and the way that jurors might understand those terms.¹¹²

As a general rule, admissibility compromises do not provide an appropriate basis for introducing and regulating evidence derived from techniques that have not been adequately studied.

K Combining Evidence: Independence and Corroboration

Prosecutorial screening and admissibility decisions are vitally important because once incriminating expert evidence is admitted it no longer stands by itself. It is frequently presented as independent *even when it is not*, and to corroborate other inculpatory evidence *even though it might not*. Because forensic scientists are routinely exposed to prejudicial domain irrelevant information (that is, not required for the analysis), if treated as independent support for the case against the accused, incriminating expert evidence may be over-valued.

Prosecutorial screening and admissibility are important because they ought to focus attention on the value of techniques and opinions separate from any other evidence relevant to the accused's guilt.¹¹³ When considering *the admissibility* of incriminating expert evidence, in most cases prosecutors and judges should not consider the existence of other incriminating evidence or the strength of the case against the accused. For *admissibility*, techniques and derivative opinions should stand or fall on their own. It does not matter if the case is strong or weak, the admissibility of expert evidence should generally be considered independently.

Once admitted, forensic science and medicine evidence no longer stands, or needs to be assessed, on its own. Once admitted the tribunal of fact may combine evidence and bolster weak evidence as part of the evidence (and story) it accepts. Decision-makers should not, however, ignore dependence and contamination if these were present in the production of incriminating expert opinions.

111 Notwithstanding facial mapping evidence being limited to description of similar features between a person of interest and the accused in NSW, in practice highly credentialed witnesses often testify in terms that attribute significance to similarities, such as 'high level of anatomical similarity'. See, eg, *Morgan v The Queen* (2011) 215 A Crim R 33, [76]; *Honeysett v The Queen* [2013] NSWCCA 135; *Gilham* [2012] NSWCCA 131.

112 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; Martire et al, above n 96.

113 Many of the issues in this section also apply to prosecutors. See Alafair Burke, 'Improving Prosecutorial Decision Making: Some Lessons from Cognitive Science' (2006) 47 *William & Mary Law Review* 1587; Alafair Burke, 'Talking about Prosecutors' (2010) 31 *Cardozo Law Review* 2119.

Despite the fact that forensic analysts are regularly exposed to domain irrelevant information, issues of contextual bias and cross-contamination tend to rise only rarely (and perfunctorily) in trials. Contextual bias and cross-contamination introduce serious threats to incriminating opinions and their relationship to other evidence and the standard or proof. If, for example, an analyst is exposed to prejudicial information that is not relevant to their analysis, then there is a real risk that this information will influence, and even contaminate, their interpretation.¹¹⁴ Studies have demonstrated that exposure to domain irrelevant information has the ability to lead fingerprint examiners to shift between classifying the same pair of prints as a match and a non-match, and cause DNA analysts to include or exclude a profile from a mixed sample in an electropherogram.¹¹⁵

The effects of contextual bias may persist notwithstanding the analyst's experience or training and regardless of whether they are aware of the risks. Cognitive biases are not moral or ethical failings. Rather, they are a result of our cognitive architecture, experience and socialisation.¹¹⁶ Often they influence unconsciously such that the analyst is oblivious. In consequence, as part of their concern with the reliability of incriminating expert evidence and the fair and impartial presentation of that evidence, prosecutors ought to consider the circumstances in which any expert evidence was developed. And, in presenting the case, they should refrain from suggesting that forensic science evidence provides independent support for, or corroborates, other evidence unless they are confident that the analyst was not affected by domain irrelevant information and other threats to accuracy.

L Opening and Closing Statements, Summing Up and Directions

Prosecutors must be careful not to mislead in opening and closing addresses. Appropriate terminology should be employed, and qualifications included, with references to incriminating expert evidence at trial.

The prosecutor should assist the trial judge with appropriate directions and/or warnings for incriminating expert evidence.¹¹⁷ This assistance should, as far as possible, draw upon relevant studies capable of assisting the tribunal of fact to understand the technique and evaluate the evidence. Where there are no studies, and the evidence is nevertheless admitted, the lack of study and its significance should be clearly conveyed to the tribunal of fact. They should also be told that peak scientific organisations and mainstream biomedical researchers stress the

114 The effects depend on a variety of factors and tend to be strongest when the analysis is difficult.

115 Itiel Dror, David Charlton and Ailsa Péron, 'Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications' (2006) 156 *Forensic Science International* 74; Itiel Dror and Greg Hampikian, 'Subjectivity and Bias in Forensic DNA Mixture Interpretation' (2011) 51 *Science & Justice* 204.

116 Itiel Dror, 'The Paradox of Human Expertise: Why Experts Get It Wrong' in Narinder Kapur (ed), *The Paradoxical Brain* (Cambridge University Press, 2011) 177.

117 These seem to be relatively ineffective, but while they persist this remains a responsibility. See also Supreme Court of Victoria, 'Simplification of Jury Directions Report' (Weinberg Report, 2012).

need for study and, where apposite, caution against placing reliance on speculative practices.

M Plea Bargains

Prosecutors have obligations that apply to pre-trial phases and plea and charge negotiations. Prosecutors should not rely on unreliable, speculative and ‘shaky’ expert evidence in plea and charge negotiations and should not (mis)use insufficiently reliable opinions to secure admissions and bargains from those accused of criminal acts. On all occasions where incriminating expert evidence is relied upon, limitations with techniques and opinions should be disclosed. Reliable techniques are likely to provide evidence valuable to plea and charge negotiations and prosecutions.

N Prosecutors Should Address Limitations with Expert Reports and Failure to Comply with Expert Codes

Prosecutors should require experts to produce reports (and testimony) that comply with jurisdictional reporting obligations – often outlined in codes of conduct.¹¹⁸ Expert reports should clearly identify limitations with the analysis and conclusion and draw the reader’s attention to both supportive and critical literatures. They should be a resource for the parties and the court. The expert is, after all, supposed to operate impartially and has a fundamental duty to the court. Prosecutors cannot simply accept an expert’s self-serving claim that they have complied with the Code of Conduct as the basis for reliance, particularly if there are no references to relevant studies, standards and protocols, limitations or error rates.¹¹⁹

O (What About) Defence Lawyers?

It might be argued that this instantiation of prosecutorial obligations gives defence lawyers an easy time. To some extent that may be true. However, the presence of a defence lawyer does not provide prosecutors with grounds for adducing insufficiently reliable scientific and medical evidence or abandoning responsibility for identifying and explaining limitations, including potentially debilitating limitations, to decision-makers. Similarly, the fact that limitations *might* be successfully explained to the tribunal of fact during an adversarial proceeding – through cross-examination, rebuttal expertise or in a closing address – does not provide grounds for making defence lawyers the primary bulwark against unreliable and speculative incriminating opinions. While the defence obviously has a role to play in relation to incriminating expert evidence,

118 See, eg, Chief Justice Allsop, Federal Court of Australia, ‘Expert Witnesses in Proceedings in the Federal Court of Australia’ (Practice Note CM 7, 4 June 2013). See also Bryan Found and Gary Edmond, ‘Reporting on the Comparison and Interpretation of Pattern Evidence: Recommendations for Forensic Specialists’ (2012) 44 *Australian Journal of Forensic Sciences* 193.

119 In *Wood*, the expert’s flagrant non-adherence to the code of conduct was said to be an issue for weight rather than admissibility: [2012] NSWCCA 21, [728]–[730] (McClellan CJ).

that role emerges once the prosecutor has clearly explained the incriminating expert evidence ‘warts and all’.

Where techniques and opinions adduced by the state and admitted are unreliable, speculative or ‘shaky’, the obligations upon defence lawyers become onerous. Generally, the defence should challenge admissibility. Where the contested evidence is admitted they are often obliged to expose limitations with the evidence in a manner that the jury can readily appreciate. No matter how prosecutors (re)interpret their professional responsibilities in response to emerging evidence about the frailties of both forensic sciences and the accusatorial trial, defence lawyers will continue to have substantial obligations in relation to the conduct of the trial and the scope for appeal.

Defence lawyers have important roles to play in relation to basically reliable techniques and competent analysis. For, there are always real dangers of error – from the collection of samples to the presentation of results – even where the underlying techniques are demonstrably reliable.¹²⁰ Defence lawyers need to maintain vigilance to make sure that prosecutors and experts meet their professional obligations to present incriminating evidence fairly and to intervene to correct any unfairness, misrepresentation, ambiguity and develop legitimate differences or alternatives.

V IF NOT PROSECUTORS, THEN... ?

Prosecutors are the most powerful players in the criminal justice system, capable of determining who should be charged and with what crimes. The duty to serve as a minister of justice is designed to limit abuse of this power and to compensate for the imbalance of resources that so often places the defense at a disadvantage. Demanding more of prosecutors than of other lawyers also fosters greater confidence in the legitimacy and accuracy of the criminal justice system.¹²¹

This article has been critical of the limited manner in which prosecutors have traditionally interpreted and applied their professional obligations with respect to expert evidence, largely insensitive to changing circumstances and emerging information about expert evidence and the adversarial trial. Insensitivity to the limits of forensic science and medicine evidence means that prosecutors may, to varying degrees, be oblivious to their complicity in the creation of many of the problems that now require attention. Prosecutors adduce(d) and judges admit(ted) opinions derived from techniques that have never been evaluated without explaining, or apparently recognising, the significance of such oversights. Rather than require evidence of ability and accuracy, courts accepted, and sometimes preferred, *apparent utility* and the *non-systematic experience* of those they deemed *experts*. Premature legal recognition and continued reliance on

120 Human involvement introduces the risk of error. See, eg, F H R Vincent, ‘Inquiry Into the Circumstances that Led to the Conviction of Mr Farah Abdulkadir Jama’ (Report No 301, Victorian Government Printer, May 2010).

121 Medwed, above n 58, 2.

insufficiently reliable techniques and opinions cannot continue. Such recognition and reliance is not consistent with overarching aspirations and the obligations of prosecutors and judges because they threaten the primary goals of the accusatorial trial – doing justice in the pursuit of truth.¹²²

Historically, responsibility for identifying and explaining limitations with incriminating expert evidence has fallen ‘between stools’. Prosecutors have been guided by liberal admissibility standards and a commitment to the jury determining the weight of all the evidence. In all common law jurisdictions judges have been accommodating of expert evidence on the ground that trial safeguards are effective means of controlling it. Judges, as a professional group, are yet to fully appreciate the extent of problems with forensic science and medicine and their shared responsibility for the unfortunate state of affairs. Forensic analysts have, in general, been willing to testify whenever called upon. Too often, and with confidence, they have proffered opinions that were not empirically grounded, and only occasionally (and often reluctantly) made appropriate concessions. They often omitted limitations on the ground that they were not asked, and invoked previous involvement in investigations and appearances in courts as evidence of their ability and accuracy. Defence lawyers have generally performed poorly at identifying and explaining the depth of problems with incriminating expert evidence. Given these unsatisfactory performances it seems incumbent upon prosecutors to change their approach.

Apprised of the various problems, prosecutors should begin to re-evaluate their practices in ways that improve the quality of incriminating expert evidence relied upon in and out of court. They should do this regardless of what judges do in relation to admissibility standards, regardless of the quality of the defence and resources available to the defence, and regardless of how forensic analysts and their institutions respond to authoritative calls for reform.

Prosecutors have formal obligations to systematically address notorious problems with forensic science and medicine in the exercise of their discretions and in their trial and appellate practice. They are ‘repeat players ... with access to vast sources of information’.¹²³ Though not necessarily well resourced, on average prosecutors are better resourced and better organised than defence lawyers and those accused of criminal offences. They are also in a much better position than judges to undertake inquires and review specialist literatures. Prosecutors need to reliably anchor the criminal justice system to what is *known* beyond the courts (that is, to knowledge). If prosecutors do not interpret their obligations in ways that require them to confront and address problems with forensic science and medicine evidence and engage with exogenous knowledge, then it is very likely that there will not be systematic responses to system problems.¹²⁴

122 Ho, above n 40.

123 Medwed, above n 58, 20.

124 Saks discusses this in terms of adjudicative and legislative facts: Saks, above n 64, 430.

There is little doubt that the vast majority of prosecutors are decent, conscientious lawyers. For a variety of reasons, however, they have not adapted their professional responsibilities and obligations to the changed circumstances and understandings of forensic science and the accusatorial trial. This article endeavours to provide some assistance in helping prosecutors to begin to reconceptualise the contemporary meaning and significance of their professional responsibilities in the light of emerging evidence. The alternative, legal indifference to consensual scientific opinion beyond the courts, is likely to embarrass criminal justice institutions, undermine limited public confidence and perpetuate the increasingly fraught relations with science and medicine.

Seventy years ago Robert Jackson wrote:

[T]he citizen's safety lies in the prosecutor who tempers zeal with human kindness, who seeks truth and not victims, who serves the law and not factional purposes, and who approaches his task with humility.¹²⁵

At the beginning of the 21st century, liberal democracies need prosecutors to pursue truth with greater epistemic humility.

125 Robert Jackson, 'The Federal Prosecutor' (1940) 24 *Journal of American Judicature Society* 18, 20. Jackson was US Attorney General, Associate Justice of the US Supreme Court and chief US prosecutor at Nuremberg.