

Before the High Court

Honeysett v The Queen: Forensic Science, ‘Specialised Knowledge’ and the Uniform Evidence Law

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Abstract

In *Honeysett v The Queen*, the High Court will consider whether image interpretation and comparison evidence — so called ‘body mapping’ evidence — was properly admitted as expert opinion evidence, based on ‘specialised knowledge’ under s 79 of the *Evidence Act 1995* (NSW). Almost two decades after the enactment of the first of the Uniform Evidence Acts, Australian courts lack an authoritative definition of ‘specialised knowledge’ and have been reluctant to engage with the importance of assessing the reliability of incriminating opinions presented as ‘expert’. Recent reviews by peak scientific bodies suggest that the deficiencies in the evidence admitted in *Honeysett* are symptomatic of broader problems affecting the evidentiary value of forensic comparison and identification evidence. This appeal provides an opportunity to address a serious deficiency in the jurisprudence, by providing guidance on how lawyers and judges might identify insufficiently reliable expert opinion evidence.

I Introduction

A *A Time to Know*

The appeal from *Honeysett v The Queen*¹ presents an opportunity for the High Court to provide critically important guidance on the admissibility of expert opinion evidence in criminal proceedings under the now (almost) Uniform Evidence Law (‘UEL’).² The High Court has been asked to consider whether

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¹ [2013] NSWCCA 135 (5 June 2013) (*‘Honeysett’*). *Honeysett*’s trial before Judge Bozic in the District Court of New South Wales was heard in early 2011: *R v Honeysett* (Unreported, District Court of New South Wales, Bozic J, 26 August 2011). Edmond observed the image evidence at trial and the appeal. Both authors have collaborative research links with Dr Glenn Porter, who appeared as a defence witness in the trial.

² *Evidence Act 1995* (NSW); *Evidence Act 1995* (Cth); *Evidence Act 1995* (ACT); *Evidence Act 2001* (Tas); *Evidence Act 2008* (Vic); *Evidence (National Uniform Legislation) Act 2011* (NT). Queensland and Western Australia are still outside of the regime.

incriminating image interpretation and comparison evidence — so-called ‘body mapping’ evidence — was properly admitted, either as ‘specialised knowledge’ under s 79(1) of the *Evidence Act 1995* (NSW) or as ‘ad hoc expert’ evidence, in an appeal that has squarely raised the question of whether s 79(1) requires expert opinion evidence to be reliable.³ Almost two decades after the introduction of the first of the Uniform Evidence Acts, judges lack an authoritative definition of ‘specialised knowledge’ to assist with their admissibility decision-making under s 79(1).⁴ In addressing the appeal, the High Court can provide direction to lawyers and judges struggling to understand the meaning of ‘knowledge’ in their admissibility decision-making. In this column, we explain the need for an interpretation of s 79(1) of the UEL that will assist judges and lawyers seeking to prevent unreliable evidence from contaminating criminal proceedings and undermining the values embodied in accusatorial trials within an adversarial system.

We contend that too much weak, speculative and unreliable opinion is allowed into criminal proceedings, particularly in New South Wales. The problems with the contested image comparison evidence in *Honeysett* are representative of widespread problems with forensic science evidence more broadly. Following an extended review of the forensic sciences, involving submissions and hearings, a committee of the National Research Council of the United States National Academy of Sciences concluded that:

With the exception of nuclear DNA analysis ... no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source. ... 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.⁵

The *NAS Report* cast serious doubts over a range of investigative techniques, both novel and longstanding. These include those relating to: latent fingerprints; foot, shoe and tyre prints; ballistics; tool marks; bite marks; handwriting and documents; the use of images; and voice recordings. Further problems identified by the National Academy of Sciences — such as the dearth of formal evaluation and research (particularly validation studies), the lack of meaningful standards governing practice, interpretation and the way opinions are expressed, and the indifference to contextual and cognitive biases — seem to be

³ Section 79 is an exception to the exclusionary opinion rule in s 76. ‘Ad hoc’ expertise is a common law category also used as an exception to the opinion rule.

⁴ Prior to *Honeysett*, the only significant High Court cases dealing with s 79 in the context of criminal proceedings have been *HG v The Queen* (1999) 197 CLR 414 (‘HG’) and *Veleviski v The Queen* (2002) 76 ALJR 402. In *Dasreef Pty Ltd v Hawchar* (2011) 243 CLR 588 (‘*Dasreef*’), the High Court considered the requirements of s 79, but it was a civil case, and did not engage directly with ‘specialised’ knowledge’: see below n 37. The recent, unanimous, five-judge decision in *Dupas v The Queen* (2012) 218 A Crim R 507 adds a further dimension, signalling that Victorian courts may adopt a more cautious approach to the admissibility of expert evidence of unknown reliability under the UEL.

⁵ National Academy of Sciences, *Strengthening the Forensic Sciences in the United States: A Path Forward* (National Academies Press, 2009) 7–8, see also 87 (‘*NAS Report*’); see especially Harry T Edwards, ‘Solving the Problems that Plague the Forensic Science Community’ (2009) 50 *Jurimetrics* 5.

endemic.⁶ In the context of the *Honeysett* appeal, it is important to emphasise that the Committee's most disconcerting findings — those pertaining to the lack of underlying research and validation studies — appear to apply directly to Australia.⁷

We argue that the High Court should approach s 79(1) of the UEL cognisant of the serious and unanswered questions concerning many types of forensic science and medicine evidence. The High Court has the advantage of considering these issues more than two decades after the seminal United States Supreme Court decision of *Daubert v Merrell Dow Pharmaceuticals Inc*,⁸ and in the light of the recent findings about the condition of the forensic sciences outlined above. Fortunately, the very terms of the UEL s 79(1) contain the seeds of a solution. It is in the unpacking of the term 'specialised knowledge' that the appeal in *Honeysett* offers an opportunity to read *reliability* into s 79(1) and develop criteria that will assist legal actors to identify expert opinions that are susceptible to rational evaluation, within the confines of the adversarial trial. Towards this end, we suggest the kinds of criteria that will ordinarily be of assistance to trial judges and appellate courts when trying to determine whether forensic science and medicine evidence is based on 'knowledge'.

Thus, the challenge to the comparison technique and derivative opinion at the heart of the *Honeysett* appeal is of considerable moment for several reasons. First, such evidence (that is, face and/or body mapping) and others like it (such as gait, handwriting, ballistics, bite marks, tool marks, shoe, foot, tyre and latent fingerprint comparisons) is being used regularly in investigations, and, to varying degrees, is relied upon in criminal proceedings — usually to assist with contests about the identity of an offender. Second, although courts have not recognised this, there are structural similarities across the comparison (or identification) 'sciences'. While the issue to be resolved in *Honeysett* might be developed in a narrow way, restricted to the particular facts and the interpretation of images where the person of interest is disguised, there are compelling reasons to approach admissibility, particularly the meaning of 'specialised knowledge' and the implications for forensic science and medicine evidence, in a more principled fashion. There is a grave need for guidance with respect to the kinds of 'knowledge' that is capable of grounding opinion represented as 'expert'.

⁶ See also Expert Working Group on Human Factors in Latent Print Analysis, *Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach* (US Department of Commerce, National Institute of Standards and Technology, 2012); Sir Anthony Campbell, *The Fingerprint Inquiry Report* (APS Group Scotland, 2011); Stephen T Goudge, *Report of the Inquiry into Pediatric Forensic Pathology in Ontario* (Queens Printer, 2008).

⁷ There are some important differences between the organisation and funding of the forensic sciences in Australia and the United States, but the fundamental problem is, unfortunately, shared; Australian forensic scientists do not have access to a repository of scientific research unavailable to their international counterparts. See Symposium, 'What Judges Should Know about the Forensic "Sciences"' (2014) 36 *Adelaide Law Review* (forthcoming).

⁸ 509 US 579 (1993) (Blackmun J) ('*Daubert*').

B *The Case against Honeysett at Trial and Appeal*

On 17 September 2008, the Narabeen Sands Hotel, in Sydney's Northern Beaches, was robbed of \$4800 by three armed persons. Eyewitness accounts offered limited, and to some degree inconsistent, descriptive information,⁹ but the robbery was captured on the hotel's CCTV system. The offenders each wore long dark clothing and had disguised their heads and faces with 'a white pillow or T-shirt wrapped around' them.¹⁰ DNA recovered from a hammer found at the crime scene matched Honeysett's DNA profile, and it was the Crown case that he was the offender pictured in the CCTV footage carrying the hammer: see Figure 1. A DNA profile obtained from a T-shirt found in the alleged (stolen) getaway vehicle, recovered more than two months after the robbery, also matched Honeysett's profile.¹¹ The images were made available for the jury for their own interpretation and evaluation, but the prosecution supplemented this evidence by adducing, over objection, interpretations of the images by a Professor of Anatomy, Maciej Henneberg, from The University of Adelaide.¹² His opinion was adduced as circumstantial evidence that went to the issue of identity;¹³ it was used to suggest that the DNA results were not mistaken, and to rebut the defence contention that DNA recovered from the hammer and T-shirt were from innocent contacts (or transfer).¹⁴

Having examined the CCTV images of the robbery, focusing particularly on the images of the robber carrying the hammer, Henneberg testified about eight common features that he claimed he could discern.¹⁵ These were:

⁹ See *Honeysett* [2013] NSWCCA 135 (5 June 2013) [4]–[7]. Dark skin colouring was a common feature.

¹⁰ *Ibid* [1].

¹¹ Images taken by a speed camera of a person driving a car thought to be the getaway vehicle in the aftermath of the robbery show something, apparently white, wrapped around the driver's head. Both profiles were reported to occur in fewer than one in 10 billion individuals in the general population. The volume of DNA on the T-shirt was said to be inconsistent with secondary transfer. It was, therefore, extremely likely that it was Honeysett's DNA on the T-shirt and hammer. The question was how/when it was deposited, taking into account, not only the delay in the recovery of the t-shirt, but also that in the CCTV footage, the offender carrying the hammer appears to be wearing gloves.

¹² This commentary, unavoidably, focuses in some detail on the evidence and techniques of Professor Henneberg, but similar practices are common among image comparison witnesses. Undoubtedly, Henneberg is a well-credentialed anatomist. Our concern is not with Professor Henneberg or anatomy, but rather with the interpretation of images (and other traces) for purposes related to identification. Assigning a Latin name to a body part reveals nothing about the ability reliably to discern features in CCTV images, let alone images where the body is distorted and disguised.

¹³ See *Honeysett* [2013] NSWCCA 135 (5 June 2013) [38], relying on *Festa v The Queen* (2001) 208 CLR 593. The reference to 'circumstantial identification evidence' is unhelpful. *Festa* was an eyewitness identification case that did not require the opinion to be based on 'specialised knowledge'. Even if there is a category of circumstantial expert opinion evidence applicable to image comparison, the prosecutor must satisfy the terms of s 79(1).

¹⁴ The defence explanation for the presence of Honeysett's DNA relied, in part, on expert evidence about the shared economy of 'the Block', an area in the inner city suburb of Redfern, with a concentrated Indigenous population: *Honeysett* [2013] NSWCCA 135 (5 June 2013) [34].

¹⁵ *Ibid* [19], [22]–[27], [59]. The evidence led at trial was narrower than originally proposed, and Professor Henneberg's conclusion from his written report, that there was 'a high degree of anatomical similarity between the Offender and ... Honeysett' was not put before the jury in those terms.

1. ‘an adult male’;
2. ‘had a “skinny body build”, that is, that he was ectomorphic’;
3. ‘was of medium body height’;
4. ‘[H]e carries himself very straight so that his hips are standing forward while his back is very clearly visible and here’s an anatomical term, lumbar lordosis, which means well-bent small of his back, and this is overhung by the shoulder area’;
5. ‘the offender’s hair was short’;
6. ‘his brain case [is] Dolichocephalic’ and ‘he had a head shape that was more like a football than a soccer ball’ and described the distinction as one of ‘the best studied variable features in the human population’;
7. ‘right-handed’;
8. ‘the offender had skin that was a dark colour’.

On the basis of his subsequent examination of reference images of Honeysett provided by the police, Henneberg ‘indicated that the appellant shared these eight features’ and, that ‘he was not able to discern any differences between the offender and the appellant’.¹⁶

The defence objections to the admission of this evidence, raised on the voir dire, focused on the poor quality of the images, the relevance of the opinion evidence, and whether the evidence satisfied s 79. The defence called two rebuttal witnesses to challenge both the susceptibility of the images to meaningful interpretation, and the conclusions proffered by Professor Henneberg. The first, Dr Sutisno, is an anatomist working as a senior lecturer in forensic biology at the University of Technology, Sydney, whose participation (at least implicitly) endorsed the image comparison technique. She, however, disagreed with Henneberg’s interpretations, particularly conclusions around the sex of the robbers, the shape of the body and head, the presence of lumbar lordosis, length of hair, skin colour and right-handedness.¹⁷ The defence also called Dr Porter, a photographer and image specialist working in Forensic Science at the University of Western Sydney, and formerly employed by the Australian Federal Police. Porter’s evidence focused on the difficulty of interpreting colours, particularly skin colour, and problems created by image distortion¹⁸ — see Figures 1 and 2.

¹⁶ Ibid [28]; see also [35].

¹⁷ Ibid [30]. The anatomist called by the defence, Dr Sutisno, has given evidence for the prosecution in a number of cases, including *R v Tang* (2006) 65 NSWLR 681 (*‘Tang’*).

¹⁸ Ibid [31].

Figure 1. CCTV image of ‘Dolichocephalic man’ carrying a hammer.



Honeysett appealed his conviction on the grounds that the opinion evidence of Professor Henneberg was wrongly admitted and, in particular, ran counter to the decision in *Morgan v The Queen*, which had been handed down in the interim between Honeysett’s trial and the hearing of his appeal.¹⁹ Drawing now on the apparent precedent of *Morgan*, the defence arguments pointed again to a lack of basis for Professor Henneberg’s opinion, his failure to reveal his reasoning process, and a lack of relevant expertise in ‘body mapping’, particularly where an offender was disguised (in *Morgan* the offender was wearing a balaclava), or concealed his or her body with clothing.

Rejecting Honeysett’s appeal, Macfarlan JA (with whom Campbell J and Barr AJ agreed) first recounted the Professor’s eight points of similarity, his extensive qualifications, his experience in comparing images in forensic contexts, the preparation of many expert reports (and certificates) and a not inconsequential number of occasions where he provided oral testimony.²⁰ Macfarlan JA distinguished *Morgan* in a number of ways; most significantly, recasting the exclusion of Henneberg’s evidence in *Morgan* as primarily concerned with the *expression* of his opinion, rather than as a result of a challenge to his expertise in

¹⁹ (2011) 215 A Crim R 33 (*Morgan*). In *Morgan*, Henneberg’s ‘body mapping’ evidence, based on image comparisons, was found to be inadmissible. The High Court decision in *Dasreef* (2011) 243 CLR 588, handed down in June 2011, was also available to the appeal court: see below n 37.

²⁰ *Honeysett* [2013] NSWCCA 135 (5 June 2013) [17].

body mapping per se. Pointing out that in *Honeysett* Henneberg had merely described similarities, and expressed an opinion about a lack of differences, Macfarlan JA found that this did not equate to the evidence rejected in *Morgan* where he had suggested that the features shared by the person of interest and the accused amounted to ‘a high level of anatomical similarity’.²¹ Confining *Morgan* to its facts, he concluded that ‘Professor Henneberg’s expertise equipped him to express views about the shape of the offender’s head and face’.²² In response to the defence argument that the evidence in *Honeysett* was merely descriptive of features that were visible to the jury, and that therefore Henneberg’s evidence did not amount to an opinion based on specialised knowledge, Macfarlan JA pointed to the poor quality of the images. Accepting at face value Henneberg’s claim to be able to read useful information off the image, Macfarlan JA concluded that the evidence would have assisted the jury.²³ Finally, the argument based on concerns expressed in *Morgan* about a possible ‘white coat effect’ — where the expert might exert exaggerated, unfairly prejudicial, influence — was rejected, since *Honeysett* had not relied on ss 135 or 137 of the *Evidence Act 1995* (NSW).²⁴

Thus Macfarlan JA determined that the analyst’s opinion was admissible in the following, orthodox, terms:

In these circumstances, I conclude that the challenged evidence of Professor Henneberg was admissible and that this ground of appeal should be rejected. For the reasons I have given, he has specialist knowledge based on his training, study and experience and his evidence was based on that specialised knowledge.²⁵

In addition, the Court confirmed the trial judge’s decision that the opinions of Henneberg were also admissible on the alternative basis that, having viewed the CCTV images a number of times, he was qualified to give evidence as an ‘ad hoc expert’.²⁶

II Section 79(1) and ‘Specialised Knowledge’

A ‘Specialised Knowledge’ and Reliability

The ‘opinion rule’ in s 76 of the UEL is exclusionary. It appears to cover the field when it comes to the admissibility of opinions intended ‘to prove the existence of a fact about the existence of which the opinion was expressed’.²⁷ The exception for expert opinion evidence in s 79 of the UEL states:

Exception: opinions based on specialised knowledge

²¹ Ibid [56]–[57].

²² Ibid [58] ff. Compare *Morgan* (2011) 215 A Crim R 33 59–61 [138]–[144].

²³ Ibid [64].

²⁴ Ibid [65].

²⁵ Ibid [66].

²⁶ Ibid [53], [60].

²⁷ UEL s 76(1).

(1) If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.

The appellant's arguments before the High Court in *Honeysett* directly raise the question of what is meant, and required, by the phrase 'specialised knowledge'.²⁸ In this section, we focus on this phrase because explication will help lawyers and judges to determine if there is 'specialised knowledge', as part of their obligation to assess whether contested opinions are 'wholly or substantially based on' it and whether the witness 'has' it. As we explain, 'specialised knowledge' is not only important for grounding admissibility; simultaneously it provides information that facilitates the rational evaluation of expert opinion evidence.²⁹

Despite the recitation of the UEL's terminology in its reasons, the New South Wales Court of Criminal Appeal decision displays a profound lack of engagement with the requirements of s 79. Rather than focus on what the specialised *knowledge* might be, whether the analyst in fact possesses it, and whether the opinion is based upon it, the appeal and the Court of Criminal Appeal focused on a range of tangential and ultimately diversionary issues.³⁰ One might expect that, in criminal proceedings where the admissibility of incriminating expert opinion evidence was unsuccessfully challenged at trial and on appeal, the record would provide a clear indication of the 'specialised knowledge' possessed by the analyst. Instead, the existence of 'specialised knowledge' seems to have been taken for granted, apparently because the anatomist's claims — given his training, study and experience — appeared plausible. To some extent, 'specialised knowledge' seems to have been conflated with 'training, study or experience' and the admission of the opinion evidence was supported by considerations — such as perceived need and expediency — that do not feature in the text of s 79(1).³¹

²⁸ See Transcript of Proceedings, *Honeysett v The Queen* [2014] HCATrans 57 (14 March 2014); Honeysett, 'Appellant's Written Submissions', Submission in *Honeysett v The Queen*, No S 57 of 2014, 22 April 2014 <http://www.hcourt.gov.au/cases/case_s57-2014>.

²⁹ See, eg, Gary Edmond, Matthew B Thompson and Jason M Tangen, 'A Guide to Interpreting Forensic Testimony: Scientific Approaches to Fingerprint Evidence' (2014) 13 *Law, Probability and Risk* 1.

³⁰ For example, the existence of a 'field' recognised in earlier decisions. In this respect, *Honeysett* is typical of decisions on s 79 that emphasise the need to focus on the wording of the UEL, but nonetheless revert to common law concepts and patterns of reasoning, eliding the significance of the inclusion of terms such as 'specialised knowledge'. Section 79 does not replicate the common law; for example, there is no reference to 'field' in s 79, nor does the common law require 'specialised knowledge'.

³¹ Rather than evidence of 'specialised knowledge', in *Honeysett* there is evidence of previous legal practice and experience (that it, past appearances and prior admission of similar evidence) and of training and study in a cognate discipline: see, also *Tang* (2006) 65 NSWLR 681; *Morgan* (2011) 215 A Crim R 33; the common law decisions in *Murdoch v The Queen* (2007) 167 A Crim R 329 ('*Murdoch*'); *R v Dastagir* (2013) 118 SASR 83 ('*Dastagir*'). The Court also relies on the English decision in *R v Gardner* [2004] EWCA Crim 1639. The reference to English case law is curious given that there is no requirement for 'knowledge' in England and Wales. Moreover, English courts allow analysts, whether anatomists, artists or police officers, to express positive opinions about the identity of persons in images. See *Honeysett* [2013] NSWCCA 135 (5 June 2013) [46] and contrast *Attorney General's Reference (No 2 of 2002)* [2002] 1 Cr App R 321.

Notwithstanding the longstanding and expanding reliance on forensic science and medicine evidence in criminal proceedings, there has been limited interest in the meaning of ‘specialised knowledge’ in the Australian case law. In this regard, cases such as *Dasreef*,³² *HG*,³³ and *Morgan*³⁴ are unexceptional. In *HG*, the High Court offered an authoritative interpretation placing conspicuous emphasis on the form of opinion evidence:

[T]he provisions of s 79 will often have the practical effect of emphasising the need for attention to requirements of form. By directing attention to whether an opinion is wholly or substantially based on specialised knowledge based on training, study or experience, the section requires that the opinion is presented in a form which makes it possible to answer that question.³⁵

These requirements have been widely rehearsed.³⁶ Consequently, the jurisprudence and practice revolves primarily around the form rather than the substance of expert opinion evidence.³⁷ Trial courts have not been provided with definitions and criteria that might enable them to determine whether ‘specialised knowledge’ exists and, if so, is capable of supporting proffers of expert opinion.

Perhaps the most prominent exception to the apparent reluctance to develop the meaning of ‘specialised knowledge’ is the decision of the New South Wales Court of Criminal Appeal in *Tang*.³⁸ Considering the meaning of ‘specialised knowledge’ in response to an earlier challenge to the admissibility of image comparison evidence from an anatomist, the Court drew upon influential United States jurisprudence. Spigelman CJ explained:

The meaning of ‘knowledge’ in s 79 is, in my opinion, the same as that identified in the reasons of the majority judgment in *Daubert v Merrell Dow Pharmaceuticals Inc* 509 US 579 (1993) at 590: “[T]he word “knowledge” connotes more than subjective belief or unsupported speculation. The term “applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds”.”³⁹

However, Spigelman CJ nonetheless sought to contain the implications of this definition of ‘knowledge’. Curiously, given the reliance on *Daubert*, he insisted that the ‘focus of attention must be on the words “specialised knowledge”, not on the introduction of an extraneous idea such as “reliability”’.⁴⁰ When it came to

³² (2011) 243 CLR 588.

³³ *HG* (1999) 197 CLR 414.

³⁴ (2011) 215 A Crim R 33.

³⁵ *HG* (1999) 197 CLR 414, 427 [39] (Gleeson CJ).

³⁶ See, eg, *Ocean Marine Mutual Insurance Association (Europe) OV v Jetopay Pty Ltd* (2000) 120 FCR 146; *Pan Pharmaceuticals Ltd (in liq) v Selim* [2008] FCA 416; *Daniels v Western Australia* [2000] FCA 1334; *Gambro Pty Ltd v Fresenius Medical Care Australia Pty Ltd* (2007) 245 ALR 15; *Dura (Australia) Constructions Pty Ltd v Hue Boutique Living Pty Ltd (No 3)* [2012] VSC 99.

³⁷ *Dasreef* (2011) 243 CLR 588 did emphasise that compliance with the terms of s 79 went to admissibility, and not merely weight, but the decision is primarily concerned with the basis of the expert’s opinion, not the more fundamental question of whether the expert has ‘specialised knowledge’.

³⁸ (2006) 65 NSWLR 681.

³⁹ *Ibid* 712 [138]. The quoted definition is from an American dictionary.

⁴⁰ *Ibid* 712 [137].

explaining the implications for the appeal in *Tang*, the Court did not do much with its new definition. Precisely what constituted the relevant ‘specialised knowledge’, and how the anatomist’s opinions related to it, are far from obvious in *Tang*. The comparative technique relied on by the witness was untested, and the value of opinion derived from it was unknown.⁴¹ In the absence of formal evaluation, the opinion was subjective and speculative. Acknowledged limitations, and an apparent failure to comply with s 79, seem to have been overwhelmed by the confidence invested in the anatomist’s training and experience, the considerable time she had devoted to looking at the images (thereby becoming an ad hoc expert), along with the belief that the low quality images effectively precluded the jury from undertaking its own comparison.⁴²

Thus, the approach exemplified in *Tang* is not especially helpful. Not only does the rejection of ‘reliability’ appear inconsistent with the need for ‘known facts’, ‘accepted truths’, and more than ‘subjective belief’ and ‘unsupported speculation’, the decision does not provide trial judges (and lawyers) with criteria that might assist with decisions about admitting (and adducing and challenging) expert opinion evidence. As we explain, the reluctance to read ‘reliability’ into ‘knowledge’ is inconsistent with the interpretation favoured by the United States Supreme Court, as well as the approach to expert evidence adopted by the Supreme Court of Canada and recommended by the Law Commission of England and Wales.

In *Daubert*, in their attempt to define the meaning of ‘scientific knowledge’, drawn from the phrase ‘scientific, technical and other specialized knowledge’ in ‘Rule 702: Testimony by Expert Witnesses’ of the Federal Rules of Evidence (‘FRE Rule 702’), the United States Supreme Court went further than *Tang*. The Court explained that the phrase imposed ‘a standard of evidentiary reliability’:

But, in order to qualify as ‘scientific knowledge,’ an inference or assertion must be derived by the scientific method. Proposed testimony *must be supported by appropriate validation* — ie, ‘good grounds,’ based on what is known. In short, the requirement that an expert’s testimony pertain to ‘scientific knowledge’ *establishes a standard of evidentiary reliability*.⁴³

The Court stressed that the ‘overarching subject is the scientific validity — and thus the evidentiary relevance and reliability — of the principles that underlie a proposed submission’.⁴⁴

⁴¹ Cf *Morgan* (2011) 215 A Crim R 33, 59–61 [138]–[144].

⁴² *Tang* (2006) 65 NSWLR 681, 685 [14]. In *Tang*, the jury were said to be incapable of interpreting the low quality CCTV images of the robbery without assistance. Perceived need is not, however, a basis for admitting opinions that do not comply with the terms of s 79(1). There is never a ‘need’ to admit the speculative opinions of those characterised by the prosecutor (and perhaps the judge) as ‘experts’. There was also a question about the need for expert assistance in *Morgan* (2011) 215 A Crim R 33, 60–1 [144].

⁴³ *Daubert*, 509 US 579, 590 (1993) (Blackmun J) (emphasis added). The Supreme Court relied on *Webster’s Third New International Dictionary* (1986).

⁴⁴ *Ibid* 594–5. The Supreme Court explained, at 590 fn 9, that: ‘scientists typically distinguish between “validity” (does the principle support what it purports to show?) and “reliability” (does application of the principle produce consistent results?)’.

Endeavouring to provide practical assistance to trial judges, the Supreme Court provided a list of criteria (the ‘*Daubert* criteria’) conventionally associated with scientific practice and knowledge production. The criteria are: (1) whether the technique can be, and has been, tested; (2) the error rate; (3) whether the technique has been described in publication (and has been subjected to peer review); (4) whether appropriate standards were applied; and (5) whether the technique has received general acceptance.⁴⁵

Subsequently, when it came to interpreting the residual component of FRE Rule 702, namely ‘technical and other specialized knowledge’ in *Kumho Tire Co v Carmichael*, the Supreme Court explained that it was the word ‘knowledge’, and not qualifiers such as ‘scientific’ and ‘specialized’, that imposed the need for reliability.⁴⁶

In *Daubert*, the Court specified that it is the [Federal] Rule’s word ‘knowledge,’ not the words (like ‘scientific’) that modify that word, that ‘establishes a standard of evidentiary reliability.’ Hence, as a matter of language, the Rule applies its reliability standard to all ‘scientific,’ ‘technical,’ or ‘other specialized’ matters within its scope.⁴⁷

Significantly, the United States is not alone in directing explicit attention toward the reliability of expert opinion. Historically, Canadian admissibility jurisprudence has not been concerned with ‘knowledge’ per se,⁴⁸ however, just over a decade ago the Supreme Court of Canada imposed a reliability threshold on expert opinion evidence because of concerns raised by wrongful convictions, the quality of forensic science and medicine evidence, and the frailty of criminal trials. In a series of decisions, the Canadian Supreme Court explicitly endorsed the *Daubert* criteria and now requires trial judges to consider the reliability of expert evidence as part of their ‘gatekeeping’ responsibility.⁴⁹ In *R v J-LJ*, Binnie J explained:

The admissibility of expert evidence should be scrutinized at the time it is proffered, and not allowed too easy an entry on the basis that all of the frailties could go at the end of the day to weight rather than admissibility.⁵⁰

Subsequently, in *R v Trochym*, Deschamps J insisted:

Reliability is an essential component of admissibility. Whereas the degree of reliability required by courts may vary depending on the circumstances, evidence that is not sufficiently reliable is likely to undermine the fundamental fairness of the criminal process.⁵¹

⁴⁵ Ibid 593–4.

⁴⁶ 526 US 137 (1999) (*Kumho*). The Supreme Court excluded the plaintiff’s evidence, but did advocate for some flexibility in the application of the *Daubert* criteria.

⁴⁷ Ibid 147. FRE rule 702 was revised in 2000 (and 2011) to accommodate the *Daubert–Kumho* jurisprudence. It now requires that ‘the testimony is the product of reliable principles and methods; and [that] the expert has reliably applied the principles and methods to the facts of the case’.

⁴⁸ See eg *R v Mohan* [1994] 2 SCR 9.

⁴⁹ *R v DD* [2000] 2 SCR 275. See also Goudge, above n 6.

⁵⁰ *R v J-LJ* [2000] 2 SCR 600, 613 [28]. See also Justice Ian Binnie, ‘Wrongful Convictions and the Magical Aura of Science in the Courtroom’ (2011) 10 *Judicial Review* 141.

⁵¹ [2007] 1 SCR 239, 260 [27].

Similarly, the Law Commission of England and Wales recently recommended a new admissibility standard, requiring expert opinion evidence to be ‘sufficiently reliable’ for admission in criminal proceedings.⁵² The Law Commission characterised the prevailing approach to the admissibility of expert opinion evidence in English criminal proceedings as ‘laissez faire’ and questioned widespread beliefs about the effectiveness of trial safeguards at consistently exposing and conveying limitations with expert evidence.⁵³

The reluctance to read ‘reliability’ into ‘specialised knowledge’ in the UEL has meant that Australian judges preside over an unusually liberal admissibility regime.⁵⁴ Rather than require ‘knowledge’, informed by indicia of reliability, they have tended to rely upon considerations such as: ‘qualifications and/or experience’; the bare description of a technique (without knowing if it works); the apparent plausibility of a technique; previous admission; and perceived need.⁵⁵ Lawyers and judges frequently refer to ‘specialised knowledge’ and the terms of s 79 in their submissions and decisions, but the relevant ‘knowledge’ is rarely identified and its relationship to opinions is rarely explained. Judges routinely insist that the opinions they admit are based on ‘specialised knowledge’, but, in the absence of evidence of reliability and the application of instructive criteria, such claims appear to be largely declaratory. *Honeysett* is exemplary in this regard.⁵⁶

What is needed in Australia is a definition of ‘specialised knowledge’ and criteria — drawing on lessons from comparable jurisdictions as well as the recommendations of authoritative scientific bodies such as the NAS — that might assist admissibility decision-making and the evaluation of evidence. In relation to most of the forensic sciences, ‘specialised knowledge’ requires evidence that the technique is reliable and fit for a specific (or *specialised*) purpose. Ordinarily, this will require independent evidence, usually obtained through formal evaluation (for example, validation studies), that a technique works (that is, it is valid) and evidence that confirms the forensic analyst is proficient in the technique. Formal evaluation provides information about the circumstances in which the technique is known to work, along with the steps and conditions (for example, protocols and standards) necessary for it to do so. It also provides an indication of the error rate, limitations and uncertainties, and the framework for expressing conclusions. This

⁵² Law Commission, *Expert Evidence in Criminal Proceedings in England and Wales*, Law Com No 325 (2009). See also Gary Edmond, ‘Is reliability sufficient? The Law Commission and expert evidence in international and interdisciplinary perspective’ (2012) 16 *International Journal of Evidence & Proof* 30.

⁵³ Law Commission, above n 52, 5 [1.20]–[21], 18 [3.4]: ‘cross-examination ... would seem to be an insufficient safeguard against unreliability for expert opinion evidence adduced under a *laissez-faire* approach to admissibility’. See also 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.

⁵⁴ The admissibility of expert opinion evidence, staunchly criticised in *Gilham v The Queen* (2012) 224 A Crim R 22 and *Wood v The Queen* (2012) 84 NSWLR 581, was not challenged at trial. Its admissibility seems to have been taken for granted by experienced prosecutors and defence counsel. Perhaps the main exception to liberal admission and disinterest in reliability, ironically, is DNA evidence. The irony stems from the fact that most DNA techniques are validated and there are, in theory, a range of highly qualified specialists available to the defence.

⁵⁵ This features in *Honeysett* [2013] NSWCCA 135 (5 June 2013). See also discussion, above n 42.

⁵⁶ See, eg, *Honeysett* [2013] NSWCCA 135 (5 June 2013) [67].

information is, or yields, *knowledge*. It not only provides the platform that enables the rational evaluation of opinions, but would seem to be necessary for admission according to the terms of the UEL.

Untested techniques and concessions from a forensic analyst do not, in contrast, provide ‘knowledge’.⁵⁷ Disclosing that studies have not been done, or that there is no relevant dataset to make inferences about the significance of similarities, merely reveals a lack of knowledge or state of ignorance. It does not fill the knowledge void and does not enable the value or weight of the opinion to be evaluated rationally. The very information — the knowledge — that would ground the opinion and enable rational assessment, is not at hand. In the absence of (demonstrable evidence of) ‘specialised knowledge’, opinions are based on impressions, speculation and guesses. They are *ipse dixit* (assertions without proof).⁵⁸ They may or may not be reliable. The problem is that we do not *know*. Even if such opinions (and the underlying techniques) are plausible, or appear to constitute good guesses, they are not ‘substantially based on ... knowledge’ and there is no exception to s 76 that renders them admissible.

At this point, it is illuminating to consider the kinds of research, scholarly publications, standards and protocols that might constitute ‘specialised knowledge’ in relation to a specific technique, ability or opinion. With respect to image comparisons, the techniques relied upon by Professor Henneberg (and Dr Sutisno and others) do not appear to have been independently evaluated. No validation studies or other forms of testing have been listed in reports or disclosed during testimony. There are, however, a variety of individuals and groups currently engaged in research that is relevant to image interpretation and comparison. These range across anatomy, physical anthropology, cognitive science, engineering, information technology (‘IT’), and photography. None of the published research provides evidence that those with formal qualifications or experience in anatomy, physical anthropology, military intelligence, engineering, photography, IT, and art, are capable of accurately identifying facial or body features from CCTV images.⁵⁹ Moreover, the publicly available research does not suggest that those with experience comparing images (for example, as a passport officer) consistently outperform those without experience, or that training in a particular domain, such as anatomy, necessarily confers an interpretive advantage.⁶⁰ The research on

⁵⁷ Often, concessions serve to confuse matters; the analyst (or investigator) might concede a lack of appropriate (or requisite) testing, yet they are nonetheless characterised as an ‘expert’, remain in the witness box, and invariably hold to their opinion.

⁵⁸ See *Tang* (2006) 65 NSWLR 681, 715 [154].

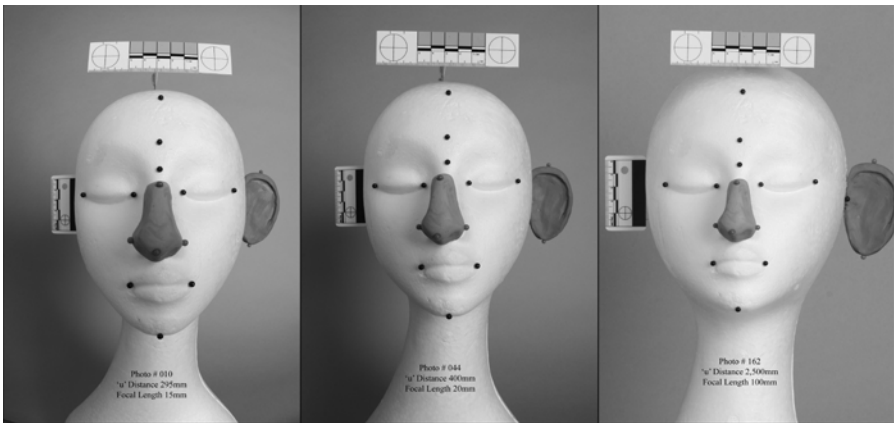
⁵⁹ There is a great deal of effort being applied to approaches that include an algorithmic dimension; however, such systems are routinely used in relation to relatively high quality reference images — such as passports and drivers’ licences.

⁶⁰ Studies suggest that experience and training may have limited value in improving abilities. For example, White et al report that the ability of passport officers to determine whether two portrait photographs are of the same unfamiliar person is unrelated to the duration of employment, with some passport officers who have been in the post for less than a year outperforming others who have held the position for more than 20 years. See David White et al, ‘Passport Officers’ Errors in Face Matching’ (2014) *PLOS ONE* (forthcoming); Alice Towler, *Evaluating Training for Facial Image Comparison* (PhD research, The University of New South Wales, 2014); Alice Towler, David White and Richard Kemp, ‘Evaluating Training Methods for Facial Image Comparison: The Face Shape Strategy Does Not Work’ (2014) 43 *Perception* 214.

unfamiliar face (and body) matching confirms that it is a difficult and error-prone task for both the experienced and inexperienced.⁶¹

There is, in addition, no independent evidence that forensic analysts are able intuitively to overcome image distortions (even if they can explain what they are) in order to describe how face and body features from CCTV and other non-standardised images appear in reality.⁶² Knowing what features actually look like — and the (distorting) effects of variables such as the distance from the camera, the type of lens used, and the manner in which images are recorded — might be considered fundamental to any comparison exercise — see Figure 2. One of the problems with image comparison is overcoming the kinds of distortions that might infect both the crime and reference images.

Figure 2: Image distortion in high quality rectilinear photographs of the same mannequin.⁶³



(Images courtesy Dr Glenn Porter)

Further, there is no evidence that anatomists are able reliably to interpret face and body features when the persons in the images are disguised.⁶⁴ Not only does there appear to be no relevant ‘specialised knowledge’, but the research that is

⁶¹ See, eg, A Mike Burton et al, ‘Face Recognition in Poor-Quality Video: Evidence from Security Surveillance’ (1999) 10 *Psychological Science* 243; Zoë Henderson, Vicki Bruce and A Mike Burton, ‘Matching the Faces of Robbers Captured on Video’ (2001) 15 *Applied Cognitive Psychology* 445; Josh P Davis and Tim Valentine, ‘CCTV on Trial: Matching Video Images with the Defendant in the Dock’ (2008) 23 *Applied Cognitive Psychology* 482; Rob Jenkins et al, ‘Variability in Photos of the Same Face’ (2011) 121 *Cognition* 313; Richard Kemp, Nicola Towell and Graham Pike, ‘When Seeing Should Not Be Believing: Photographs, Credit Cards and Fraud’ (1997) 11 *Applied Cognitive Psychology* 211.

⁶² Cf *Honeysett* [2013] NSWCCA 135 (5 June 2013) [20], [27], [48]–[49]. On problems, generally, 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.

⁶³ It is not possible to tell from these images alone the actual shape, size or even relative proportions of the features such as the ear and nose. Nor is it possible to determine the shape of the head.

⁶⁴ This seems to have been accepted in *Morgan* (2011) 215 A Crim R 33, 59–60 [138], although that Court did not direct explicit attention to the meaning of ‘knowledge’ and, following *Tang* (2006) 65 NSWLR 681, seems to have accepted, without any real explanation, that ‘facial mapping’ could be distinguished from ‘body mapping’ on the basis that there was ‘specialised knowledge’ supporting its existence as a field. Once again, this seems to reinforce the kinds of problems created by the failure to provide assistance with the meaning of ‘specialised knowledge’.

available recommends caution.⁶⁵ Finally, it is worth noting that the process of comparison used by anatomists (and other forensic analysts) often involves exposure to ‘domain-irrelevant information’, and appears vulnerable to a range of insidious influences — such as suggestion and confirmation bias — that could be avoided.⁶⁶ The way in which the investigating police solicit the opinion of analysts and the way the analysis is undertaken unnecessarily introduce non-trivial risks of contamination and error.⁶⁷

In trying to assess the admissibility and value of his incriminating opinions, it is important to recognise that the techniques relied upon by Professor Henneberg (and Dr Sutisno) are testable, but are as yet untested.⁶⁸ There is no independent evidence that they work. Without formal testing we do not *know* if the opinions expressed by those with extensive ‘training, study or experience’ are more accurate than the impressions of ordinary citizens.⁶⁹ That is, those presented as capable forensic analysts may not actually possess relevant expertise.⁷⁰ Additionally, because much of the available research — suggesting high rates of error and recommending the need for caution — is counterintuitive, the impact of the opinions of highly credentialled and experienced investigators may be difficult to overcome, even where accompanied by explanation, acknowledgment of

⁶⁵ More generally, see Dan Simon, *In Doubt: The Psychology of the Criminal Justice Process* (Harvard University Press, 2012); 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.

⁶⁶ Exposure to so-called ‘domain-irrelevant information’, especially suggestive information in contexts where interpretation is difficult, has been shown to cause highly experienced fingerprint examiners and forensic biologists (interpreting mixed DNA profiles) to reverse their interpretations of evidence: see Itiel E Dror, David Charlton and Ailsa E Péron, ‘Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications’ (2006) 156 *Forensic Science International* 74; Itiel E Dror and Greg Hampikian, ‘Subjectivity and Bias in Forensic DNA Mixture Interpretation’ (2011) 51 *Science & Justice* 204. More generally, see 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.

⁶⁷ For example, in *Honeysett* [2013] NSWCCA 135 (5 June 2013) [18], we are told that the investigating police provided only two sets of images to Professor Henneberg for comparison — those from the CCTV cameras and those of the suspect.

⁶⁸ In *Honeysett* [2013] NSWCCA 135 (5 June 2013) [63], the Court mistakenly suggests that the technique and abilities are not amenable to elaboration beyond the reasons Henneberg provided (and thus *Dasreef* (2011) 243 CLR 588 does not apply): ‘The view he expressed on this topic is necessarily subjective and not amenable to elaboration beyond the reasons he gave, or to measurement and calculation.’

⁶⁹ *Smith v The Queen* (2001) 206 CLR 650.

⁷⁰ The history of the legal admission of bullet-lead evidence, along with the use of voice spectrographs and bite marks for identification purposes, suggests that highly credentialled individuals were allowed to proffer incriminating opinions based on techniques that have subsequently been discredited. See, eg, National Research Council (US), *Forensic Analysis Weighing Bullet Lead Evidence* (National Academies Press, 2004); National Research Council (US), *On the Theory and Practice of Voice Identification* (National Academy of Sciences, 1979); Erica Beecher-Monas, ‘Reality Bites: The Illusion of Science in Bite-Mark Evidence’ (2009) 30 *Cardozo Law Review* 1369. Australian courts encountered this kind of issue in relation to claims about the age of ‘people smugglers’ derived from radiographic images: see *An Age of Uncertainty — Inquiry into the Treatment of Individuals Suspected of People Smuggling Offences Who Say that They Are Children* (Australian Human Rights Commission, July 2012).

limitations, vigorous cross-examination, rebuttal witnessess and judicial warnings.⁷¹

In the 21st century, all of this is curious. We *know* how to produce *knowledge*. We *know* how to test and validate techniques and conduct rigorous proficiency tests.⁷² We *know* how to calculate error rates and develop standards on the basis of experimental work. We *know* how to ground expressions of opinion within the constraints of validated techniques. We also *know* how to shield (or blind) analysts from domain-irrelevant information. Indeed, some of the world's leading scientific and technical organisations have recently offered advice on what forensic scientists ought to have done, before their opinions are relied upon by courts.⁷³ Orthodox research methods and the advice of peak scientific and technical organisations should influence the way we approach 'specialised knowledge' for the purposes of admissibility in criminal proceedings. In the absence of 'specialised knowledge' — evidence that demonstrates the reliability of a technique or confirms a special ability — we cannot determine whether opinion evidence is expert or even relevant.⁷⁴ While techniques might appear straightforward or plausible, and opinions derived from them might appear probative, should we assume that a forensic analyst will perform better than a jury or better than chance?⁷⁵ Critically, and as we explain in the following section, neither experience in performing a task, nor experience based on repeated exposure to images (or voice recordings), can be assumed to produce the 'specialised knowledge' required under s 79. Reliance on experience per se, or on the common law category of 'ad hoc expert', facilitates the admission of opinions devoid of knowledge.

B Experience, Knowledge and Ad Hoc 'Experts'

In *Honeysett*, in the absence of 'specialised knowledge', Macfarlan JA directed attention to the analyst's training, study and experience. There is no doubt that Professor Henneberg is an established anatomist and physical anthropologist. He

⁷¹ For example, calling rebuttal experts, especially if the analyst uses the same problematic (that is, non-validated) technique, will tend to legitimate a technique (or 'field') that may be without empirical foundation. This was a feature in *Honeysett*, and can also be seen in *Murdoch* (2007) 167 A Crim R 329, *Morgan* (2011) 215 A Crim R 33 and *Dastagir* (2013) 118 SASR 83. See also Edmond and San Roque, above n 53.

⁷² That is, we can test the ability of anatomists relative to those without anatomical training to ascertain whether they have a superior level of performance that warrants admission. We will almost never be interested in testing the specific case-related conditions. See, eg, Jason M Tangen, Matthew B Thompson and Duncan J McCarthy, 'Identifying Fingerprint Expertise' (2011) 22 *Psychological Science* 995; Jonathan Koehler, 'Proficiency Tests to Estimate Error Rates in the Forensic Sciences' (2012) 12 *Law, Probability & Risk* 89.

⁷³ See above n 6.

⁷⁴ *Evidence Act 1995* (NSW) ss 55–6.

⁷⁵ In *Honeysett* [2013] NSWCCA 135 (5 June 2013) [52], [60]–[61], the interpretation was described as mere comparison: 'essentially observational and descriptive'. Accepting that such evidence is relevant seems to run against the principles laid down in *Smith v The Queen* (2001) 206 CLR 650. Where the abilities of those presented as experts are unknown, it does not necessarily follow that it is preferable for the jury to be left with the task of interpreting unintelligible images (or other recordings). In some cases, in the absence of demonstrable expertise, admitting the images may create unfair prejudice.

holds advanced formal qualifications, has published numerous scientific papers and books, and has held senior academic positions in a variety of universities in Australia and overseas. More specifically, he has experience comparing CCTV images in previous investigations and has testified in courts in several Australian jurisdictions, where he has been cross-examined extensively about his opinions.⁷⁶

Qualifications and experience, however, may contribute to the problems, especially for laypersons hearing the opinion evidence.⁷⁷ Courts, especially in New South Wales, have tended to collapse ‘specialised knowledge’ into ‘training, study or experience’ or have effectively elided ‘specialised knowledge’. They seem to have admitted opinions based on *no more* than an analyst’s ‘training, study or experience’.⁷⁸ Equating ‘specialised knowledge’ with ‘training, study or experience’ transforms s 79(1) into tautological nonsense — where anyone with *apparently relevant* qualifications or experience might express an admissible opinion. When it comes to assessing techniques, such as image comparison, the training, study and experience of the analyst cannot overcome the failure to have evaluated the technique. In the absence of formal evaluation, we do not *know* whether the technique works nor how accurate it is (if it does), and we do not *know* if the analyst is actually proficient, regardless of any formal training and qualifications in a cognate domain, and regardless of experience doing the same or similar things.⁷⁹ Long experience does not, and should not, be used as the basis for the admission of techniques that have not been formally evaluated. Where techniques such as image interpretation and comparison (for example, face and body mapping) are in regular use, experience, whether in courts or elsewhere, should not circumvent the fundamental need for validation in order to demonstrate ‘knowledge’. ‘Specialised knowledge based on the person’s training, study or experience’ should mean that the witness is conversant with and able to identify ‘specialised knowledge’ that supports the opinion. Experience and proficiency are important once a technique has been shown to be demonstrably reliable. The utility of being experienced or qualified in the application of an untested technique is unclear.

In addition to finding that the image comparison evidence satisfied the terms of s 79(1), Macfarlan JA confirmed that Henneberg’s experience in viewing the images rendered his opinion admissible as ‘ad hoc’ expert evidence.⁸⁰ Since the introduction of the *Evidence Act* in 1995, the admissibility regime governing

⁷⁶ In many of these cases anatomists have expressed opinions that extended well beyond describing mere similarities. See, eg, the evidence originally proffered in reports or oral testimony in *Tang* (2006) 65 NSWLR 681, 687 [23], 688 [28] (‘one and the same’); *Morgan* (2011) 215 A Crim R 33, 60 [140] (‘a high level of anatomical similarity’); *R v Dastagir* (2013) 224 A Crim R 570, 579–80 [29] (‘I am of the opinion that the person of interest as shown in the CCTV images is Mr Hameed Ullah Dastagir. I make this statement with practical certainty.’) appealed in *Dastagir* (2013) 118 SASR 83.

⁷⁷ See *Morgan* (2011) 215 A Crim R 33, 61 [145].

⁷⁸ In *Tang* (2006) 65 NSWLR 681, there was no evidence of validation and no information about the frequency of facial features in the relevant population. Interestingly, the jury asked ‘Accepting Dr Sutisno’s qualifications should we therefore accept her methodology?’: at 695 [50]. These are the sorts of difficulties that emerge — whether spoken or unspoken — when formally qualified individuals advance opinions developed using techniques that have not been evaluated.

⁷⁹ See discussion above n 60.

⁸⁰ *Honeysett* [2013] NSWCCA 135 (5 June 2013) [41]–[45], [60].

expert evidence in New South Wales has been subverted by expansion in the use and scope of ‘ad hoc expertise’. In Australia, the category of ad hoc ‘expert’ emerged in *Butera v DPP (Vic)*,⁸¹ in the restrictive context of the status of transcripts of contested voice recording.⁸² However, notwithstanding ss 76 and 79, over the last two decades, New South Wales courts have expanded the recognition of ad hoc expertise, derived from exposure to contested recordings or images, as a type of admissible opinion. Faced with often lengthy and unclear voice recordings, or unclear incriminating images, New South Wales courts have allowed a variety of forensic analysts, interpreters, and investigators to proffer their incriminating opinions not merely about the words that were allegedly spoken (as in *Butera*), but also about the identity of the speaker or persons of interest in images.⁸³ These analysts and investigators are frequently exposed to a great deal of highly suggestive domain-irrelevant information about the case. They are not necessarily conversant with research methods, relevant research and limitations, and generally have no relevant training or study (and sometimes no experience) in voice or image comparison.⁸⁴

Section 76 appears to cover the field. This is particularly important in relation to ad hoc expert evidence. For, if the witness does not satisfy the terms of s 79(1), then he or she cannot offer an incriminating opinion ‘to prove the existence of a fact about the existence of which the opinion was expressed’. We should not encourage highly credentialled or experienced analysts (or investigating police officers) to express opinions that are speculative, let alone treat such opinions as expert evidence.⁸⁵ The limited jurisprudence on ad hoc experts has been disengaged from the issue of ‘specialised knowledge’; those proffering ad hoc expert opinions are rarely called upon to identify their relevant ‘specialised knowledge’.⁸⁶ While an argument might be made along the lines that ad hoc experts possess ‘experience’ gained through the course of the investigation, this experience, for the reasons outlined above, does not equate to ‘specialised knowledge’.

Some of the problems with the concept of ad hoc expertise can be discerned in the following passage from Macfarlan JA’s judgment:

⁸¹ For a critical assessment, see Gary Edmond and Mehera San Roque, ‘Quasi-Justice: Ad Hoc Expertise and Identification Evidence’ (2009) 33 *Criminal Law Journal* 8.

⁸² *Butera v DPP (Vic)* (1987) 164 CLR 180 applying *R v Menzies* [1982] 1 NZLR 41, 49.

⁸³ There are many problems with such an approach. For a range of criticisms, see Gary Edmond, Kristy Martire and Mehera San Roque, ‘Unsound Law: Issues with (“Expert”) Voice Comparison Evidence’ (2011) 35 *Melbourne University Law Review* 52; Edmond et al, above n 62. Transcripts themselves are not without difficulties: see Helen Fraser, ‘Transcripts in the Legal System’ in Ian Freckelton and Hugh Selby (eds), *Expert Evidence* (Thomson Reuters, 2010) ch 100.

⁸⁴ See cases discussed in Edmond and San Roque, above n 81. But cf *R v Flynn* [2008] 2 Cr App R 266 [14]; *R v Nguon and Ream* (Unreported, New South Wales District Court, Whitford J, 31 March 2014).

⁸⁵ See *Smith v The Queen* (2001) 206 CLR 650, 668–9 [56]–[57] (Kirby J). These concerns have a long lineage, as evidenced by *R v Crouch* (1850) 4 Cox CC 163, 164.

⁸⁶ Nor are they necessarily subjected to the obligations contained in applicable expert witness codes of conduct. Investigators and interpreters who are recognised by the courts as ‘ad hoc experts’ are rarely required to produce a compliant report prior to the trial.

Professor Henneberg's detailed consideration over a lengthy period of the CCTV footage in the present case rendered him an *ad hoc* expert of the type described in *Tang* ... His individual and detailed examination of the footage *could be expected* to have put him in a *superior position to that of the jury* which *would have had* a collective viewing over what would, in practical terms, be likely to have been a far shorter time. Professor Henneberg's prior training, study and experience *would of course* have added to that advantage.⁸⁷

Rather than identifying the relevant 'specialised knowledge', the speculative nature of the enterprise emerges. Significantly, these hypothetical assertions are testable. Formal evaluation would produce 'knowledge' rather than supposition. Instead, untested experience is privileged, plausible sounding assumptions are made about the relationship between qualifications and proficiency, and expedition and perceived necessity are used to rationalise the admission of opinions that are not based on 'knowledge', nor supported by the publicly available scientific research on identification and comparisons.

III The Rational Evaluation of Expert Opinion Evidence

Without 'specialised knowledge' it is difficult to assess the opinions of forensic analysts. In the absence of information about validation, error rates, standards, and the processes used to insulate analysts from contextual bias, lawyers, judges and triers of fact are obliged to use criteria that are not diagnostic of probative value. Where techniques have not been formally evaluated and the proficiency of analysts is unknown, all we have to go on is: the apparent plausibility of the technique and opinion; the formal study and training of the analysts; their general experience; their specific experience in previous investigations and prosecutions; their ability to withstand (frequently perfunctory) cross-examination;⁸⁸ impressions of demeanour and credibility; earlier admissibility decisions (as legal recognition or endorsement of expertise); and the willingness of prosecutor (a minister of justice and representative of the state) to rely upon it. The problem is that, individually and in combination, these considerations neither constitute nor equate with 'knowledge'. They do not confirm that a technique works. They say nothing about the reliability of derivative opinions. They reveal nothing about the analyst's proficiency. They are distractions. They divert attention from the 'knowledge' that would enable rational evaluation.

A Reliability: Forensic Science Evidence 20 Years after Daubert

What does 'specialised knowledge' require from those proffering (incriminating) comparison evidence? What kinds of criteria should inform the legal assessment of

⁸⁷ *Honeysett* [2013] NSWCCA 135 (5 June 2013) [60] (emphasis added). Expert disagreement is used to support admission, even though the disagreement is, at least in part, forced on the defence by the inattention of the prosecutor and judges to 'specialised knowledge'.

⁸⁸ Note that the admission of the opinions converts the requirement for 'specialised knowledge' into a question of being able to persuade the tribunal of fact during an adversarial proceeding. This is far from persuading scientists (or other attentive individuals) that there is knowledge capable of supporting the opinion.

reliability? The criteria below provide insight into the existence of ‘specialised knowledge’. They represent an updated version of the *Daubert* criteria, oriented to forensic science and medicine evidence.⁸⁹ They direct attention to evidence that will indicate whether techniques and derivative opinions are demonstrably reliable; that is, constitute *knowledge*.⁹⁰

1. **Validation studies.** Ascertaining whether a technique is valid, through some kind of formal empirical test, is the most important of the various criteria. Most techniques can be evaluated.⁹¹ Judges should know: Has the technique been independently evaluated (or tested) in conditions where the correct answer (ie ground truth) was known? Have the results of these studies been provided to the defence and the court? Was the technique used in the investigation in a manner that is consistent with the validation studies? Non-trivial variations may compromise validation and introduce additional and unknown errors and uncertainty. Significant variations to techniques should be subjected to further validation studies.
2. **Error and uncertainty.** What is the error rate and level of uncertainty associated with the technique?⁹² Error rates and limitations derived from validation studies help us to gauge the value of opinions. Validation and proficiency studies may only generate indicative error rates, but these should be disclosed even if there will be argument (on the voir dire and/or at trial) about their implications for the opinion evidence in the instant case.
3. **Proficiency.** Is the analyst proficient using the validated technique? How do we know?
4. **Standards.** Are there standards or protocols derived through (or responsive to) validation studies? Were they applied and are they publicly available (or provided to the defence and the court)?⁹³
5. **Expression.** Are the terms and expressions used by the forensic analyst to express the opinion consistent with the results of validation studies.⁹⁴ If the analyst uses a particular form of words or an expression from a scale, is the reason for selection transparent? Is the expression likely to be understood by the trier of fact?

⁸⁹ *Daubert*, 509 US 579, 590 (1993) and *Kumho*, 526 US 137 (1999) were civil appeals, heard before the many problems with forensic science and medicine emerged over the course of the last decade.

⁹⁰ Gary Edmond, ‘Specialised Knowledge, the Exclusionary Discretions and Reliability: Reassessing Incriminating Expert Opinion Evidence’ (2008) 31 *University of New South Wales Law Journal* 1; ‘The Admissibility of Forensic Science and Medicine Evidence under the Uniform Evidence Law’ (2014) 38 *Criminal Law Journal* (forthcoming).

⁹¹ *NAS Report*, above n 5, 189: ‘Little rigorous systematic research has been done to validate the basic premises and techniques ... The committee sees no evident reason why conducting such research is not feasible.’

⁹² *Ibid* 184: ‘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.’

⁹³ *Ibid* 6.

⁹⁴ *Ibid* 185–6.

6. **Verification and peer review of results.** Generally, verification (or review) should be undertaken using a validated technique, in conditions where the original finding or opinion is unknown to the reviewer. Verification using a technique that has not been validated, and verification undertaken in conditions where the original answer was provided to the reviewer, are of unknown value.⁹⁵
7. **Contextual bias.** Was the analyst shielded from gratuitous exposure to domain-irrelevant information? Was the analyst provided with information about the case or the accused that was not required for their analysis?⁹⁶ Did the nature of the request or process suggest the (desired) answer?
8. **Multidisciplinary acceptance.** Is the technique accepted by attentive scientists across a range of disciplines? This is not limited to ‘general acceptance’ by others in the particular ‘field’ or ‘domain’ or institution. ‘Knowledge’ should be persuasive to others conversant with research methods, published research, statistics and so forth.
9. **Transparent and complete.** Is the reporting and testimony transparent, enabling others to follow what was done and the reasoning behind the decision? Are the report and testimony complete — that is, full and frank?
10. **Criticism.** Are there published criticisms and concerns pertaining to the technique or similar techniques? Have these been disclosed and, more importantly, addressed? Criticisms, concerns and recommendations expressed by authoritative scientific and technical organisations, public inquiries and independent scholars should not be overlooked or trivialised — especially where techniques have not been formally evaluated. Forensic analysts should acknowledge authoritative criticisms and concerns, even if they do not personally believe they are significant.⁹⁷

These criteria enable a court to determine whether ‘specialised knowledge’ exists. Difficulties addressing or meeting these criteria will usually suggest that techniques have not been credibly evaluated. Judges should be reluctant to excuse the inability to address these criteria — that is, an inability to produce or reference ‘specialised knowledge’ — especially for techniques in regular use. Only once there is evidence of ‘specialised knowledge’ can we begin to consider whether the analyst possesses it and whether opinions are wholly or substantially based upon it.

⁹⁵ Verification did not prevent mistaken fingerprint matches in the McKie and Mayfield cases: see Campbell, above n 6 (the McKie case); 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* (US Department of Justice, 2011).

⁹⁶ *NAS Report*, above n 5, 185.

⁹⁷ Many forensic analysts do not hold formal scientific or technical qualification and so are not necessarily in a good position to respond to criticisms based on scientific methods, statistical issues or cognitive science. See Jennifer L Mnookin et al, ‘The Need for a Research Culture in the Forensic Sciences’ (2011) 58 *UCLA Law Review* 725.

IV Conclusion: Unreliable New South Wales?

We could determine whether image interpretation and comparison techniques are reliable. However, notwithstanding more than a decade of regular use in investigations and criminal proceedings, many basic techniques are yet to be tested. When asked about their abilities, analysts and prosecutors tend to invoke experience doing image comparisons, previous involvement in investigations, the preparation of reports and appearances in criminal proceedings, the ability to withstand cross-examination, and convictions that are consistent with their opinions. These provide no evidence of relevant ‘specialised knowledge’ or ability in the specific domain. Rather, they reflect poorly on the performance and permissiveness of legal institutions that have lent their imprimatur to techniques of unknown reliability, prematurely recognising and admitting opinions based on untested techniques.

In New South Wales, the current approach to the *Evidence Act 1995* (NSW) — not only ss 76 and 79(1), but also ss 55–6, 135 and 137 — does not require lawyers, forensic analysts or courts to address the probative value of expert opinion evidence at any stage in the admission process.⁹⁸ None of the admissibility rules or mandatory and discretionary exclusions relevant to expert opinion evidence requires the trial judge to consider whether the technique works, whether the analyst is proficient, or whether an incriminating opinion is actually probative. Consequently, reliability plays no part in the admission of scientific, technical and other kinds of evidence represented as *expert*. This lack of interest in ‘knowledge’ is not conducive to the production of reliable expert evidence, rational fact-finding or accurate outcomes, nor does it encourage forensic analysts to conduct research to evaluate techniques before they are used.

Under our extant arrangements, rather than require the state to explain why proffers of expert opinion evidence are wholly or substantially based on specialised knowledge, responsibility tends to be shifted to the defence to unpack and convey limitations. Following admission, the defence is obliged to persuade the trier of fact that the opinions of highly credentialled and experienced analysts, who are admitted as expert witnesses and may have been allowed to present similar evidence in earlier criminal proceedings, do not actually possess knowledge and are proffering speculative impressions. In consequence, in New South Wales the jury has become responsible for determining whether techniques — which should have been tested but have not been — are actually based on knowledge (that is, demonstrably reliable). *Honeysett* offers the High Court an opportunity to define ‘specialised knowledge’ in a way that allows lawyers and judges to reengage with this important responsibility.

⁹⁸ By comparison, *Dupas v The Queen* (2012) 218 A Crim R 507 indicates that Victorian trial judges might be willing to consider the probative value of expert evidence under ss 135 and 137. While this represents an improvement on the approach adopted in New South Wales in *R v XY* (2013) 84 NSWLR 363, relying on s 137 places the burden on the defence to persuade judges that the probative value of the evidence is outweighed by the danger of unfair prejudice to the defendant. For a discussion of the limitations of the New South Wales approach, see Edmond, above n 90.