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### Impartiality, efficiency or reliability? A critical response to expert evidence law and procedure in Australia

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## PLENARY LECTURE

### Impartiality, efficiency or reliability? A critical response to expert evidence law and procedure in Australia

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#### 1. Introduction

This presentation might be considered a little provocative, but after reading a copy of *Strengthening the Forensic Sciences in the US* from the National Academy of Sciences – released this past week – much of what I have to say cannot be considered particularly controversial<sup>1</sup>. I'll say more about this important Report toward the end of this plenary lecture.

Tonight, I want to discuss our standards for admitting incriminating expert opinion evidence, along with some of the discretions and protections afforded to defendants in the context of the criminal trial. In the process, I'll refer to recent reforms such as codes of conduct and concurrent evidence.

In summary, my two main points are: that forensic scientists should endeavour to validate their techniques; and that courts should impose a reliability threshold on the admission of incriminating expert opinion evidence.

I'll begin with a brief discussion of our admissibility standards and a few examples of recent decisions from the NSW Court of Criminal Appeal.

#### 2. Reliability and the Uniform Evidence Law

Under the Uniform Evidence Law (or UEL), opinion evidence is generally inadmissible (section 76), although there are several enumerated exceptions. Section 79, the exception for those with 'specialised knowledge', states:

**79 Exception: opinions based on specialised knowledge**

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 the knowledge.

In recent years, Australian judges addressing the admissibility of expert opinion evidence have been formally disinterested in the reliability of expert evidence in criminal proceedings<sup>2</sup>.

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The decision in *R v Tang* (2006) affords a useful and relatively recent illustration of the way section 79 is applied to incriminating opinion evidence<sup>3</sup>. *Tang* was an appeal over the admission of *facial mapping* and *body mapping* evidence. ‘Facial mapping’ is a type of identification evidence involving anthropometric and/or morphological analysis of the face (see Figures 1 and 2). It entails comparisons of images of an unknown person – usually from security and surveillance cameras such as CCTV and ATM machines – with images of a known person – usually high quality reference photographs of a suspect. It can also involve recourse to overlays and superimpositions (see Figure 3)<sup>4</sup>. ‘Body mapping’ involves a similar set of processes extended to the body, posture and movement<sup>5</sup>.

In *Tang* a qualified anatomist, called as an expert by the prosecution, positively identified a person in security images from a robbery as Hien Puoc Tang. The security images were of such poor quality that the Court of Criminal Appeal (CCA) was of the opinion they ‘could not [have been] left for the jury’. The anatomist’s opinion was admitted over objection and the admissibility of this evidence became the principal ground of appeal.

In reviewing the admissibility of this evidence, the CCA directed its attention to section 79. So doing, it concluded that facial mapping was not ‘specialised knowledge’ that would enable the anatomist to express her opinion about the identity of the person in the security images.

The three opinions of [the anatomist] in the present case do not, in my view, go beyond a ‘bare *ipse dixit*’. [154]

And,

Facial mapping, let alone body mapping, was not shown, on the evidence in the trial, to constitute ‘specialised knowledge’ of a character which can support an opinion of identity. [146]

The Court was concerned that the process used by the anatomist was not adequately explained. Facial mapping was, therefore, incapable of supporting opinions about identity and, according to the Court of Criminal Appeal, should not have been admitted.



Figure 1. Photogrammetric points and comparison. Once the images are scaled and oriented, the anthropometrical analyst compares sizes, distances and the angles between features and/or landmarks. (The figures are from actual New Zealand case files. Courtesy of Rod McCourt, Global Intelligence Solutions.)

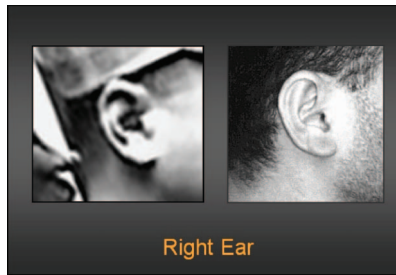


Figure 2. Morphological analysis involves the comparison of shapes, size and proportions. This analysis is typically qualitative and may focus on one or more landmarks or features, such as an ear.



Figure 3. Photographic superimposition. The face of Man B is superimposed onto the head of Man A (bottom left) and vice versa (bottom right).

Things did not end there, however. Training in anatomy, combined with the fact that the witness had spent time comparing the security images with the police reference photographs, led the Court to qualify her as an *ad hoc expert*. This common law category – used to circumvent the statutory prohibition on opinion

evidence (section 76) – was invoked to enable the anatomist to express opinions about *similarities* between the persons in the images<sup>6</sup>. The anatomist’s incriminating opinions would be admissible even though there was no ‘specialised knowledge’ and no explanation of how anatomical training (or the study of the images) would provide a reliable basis for drawing inferences about similarity (let alone identity) that were not merely ‘speculative’. It would be for a future jury to determine the reliability and weight of this incriminating opinion evidence.

Perhaps the most beguiling feature of the *Tang* appeal was the Court’s attitude toward the *reliability* of the anatomist’s opinion evidence. Adopting what might be considered a very narrow reading of the text of section 79, the Court explained that: ‘The focus must be on the words “specialised knowledge”, not on the introduction of an extraneous idea such as “reliability”’<sup>7</sup>. The Chief Justice of NSW – author of the *Tang* decision – explicitly dismissed the need to require reliability when determining the admissibility of incriminating expert opinion evidence. In consequence, reliability does not govern the admissibility of forensic science techniques.

*Tang* is not an isolated case. There are many similar examples. In *Murdoch v The Queen*, *R v Jung*, *R v Kaliyanda*, *R v Pera*, *R v Alrekabi* and so on, facial mapping evidence was adduced and relied upon by the prosecution notwithstanding the absence of a credible field, supporting literatures, validation studies, and information about error rates<sup>8</sup>. Perhaps ironically, *Tang* seems to have become a kind of precedent for the admission of facial mapping evidence.

I have written at length about expert identification based on images (in collaboration with forensic scientists and experimental psychologists), so here, in order to provide some indication of other kinds of incriminating opinion evidence routinely admitted by courts in NSW, I have decided to refer to the admissibility of identification evidence based on voice recordings<sup>9</sup>. In these examples, the range of individuals allowed to proffer incriminating opinions seems to be based on expediency and convenience rather than ‘specialised knowledge’ or ‘reliability’.

The first case I want to mention is *Regina v Li* (2003)<sup>10</sup>. There – among other witnesses (and evidence) – an academic linguist was allowed to proffer a positive identification on the basis of listening to a voice recording of the accused and a covert recording of a person implicated in the importation of heroin. Notwithstanding the existence of an emerging technical field, this linguist was allowed positively to identify the accused on the basis of naked-ear comparisons<sup>11</sup>. It was the linguist’s contention that certain features of the voices on the tapes were *similar*. The fact that the linguist had no idea about the frequency of these features among the suspect population, was not a specialist in voice comparison, had limited experience with Mandarin and Cantonese (i.e. the languages spoken), conceded that there were real dangers with cross-lingual comparisons and had not used ‘scientific methods’, all went to the weight of the evidence rather than its admissibility. That is, the CCA characterised these as questions for the jury.

[The linguist] did not appear to apply scientific methodology in the sense of using machines or measuring (or other) equipment, and although he relied only on his experience, knowledge and hearing, that did not detract from the inherent expert quality of his evidence and I consider that his evidence was properly admitted as being expert in nature.<sup>12</sup>

The upshot was that the admissibility of an incriminating opinion from an individual with specialised knowledge in linguistics – rather than voice comparison – was affirmed.

*R v El-Kheir* (2004) was another drug importation case involving a covert recording<sup>13</sup>. In *El-Kheir* there is little indication of any concern about the admissibility of an interpreter's opinions concerning the identity of a person alleged to have made incriminating statements. This response is particularly troubling because it was the interpreter who was asked to identify the speakers, even though: the sound recording was 'very poor' – rated at 2 on a scale from 0 to 10; there was considerable background noise, occasions where 'words could be heard but not understood', and there was 'at times insufficient detail . . . to form a definite opinion as to who was speaking to whom'. The interpreter listened to the recordings 'again and again and again' in order to prepare a transcript and identify the speakers. In relation to one of the allegedly incriminating statements he 'accepted that there was a 50% chance that the statement he attributed to [El-Kheir] was attributable to [El-Kheir's cousin]. Nevertheless, he was 'adamant that either [El-Kheir or his cousin] . . . made the statement.'<sup>14</sup>

Without troubling themselves about the opinion rule or the exception for 'specialised knowledge', the Court of Criminal Appeal accepted that the identification evidence provided by the interpreter was admissible in circumstances where there were real doubts about its independence, probative value or necessity. Rather than engage with sections 76 and 79 of the UEL, the Court of Criminal Appeal seemed to suggest that 'the admission of voice identification evidence [i.e. the opinion of the interpreter] was [simply] a matter for judicial discretion'<sup>15</sup>.

*El-Kheir*, along with cases like *Li, Regina v Niga and Riscuta, R v Camilleri, R v Gao, R v Leung and Wong*, and even *Korgbara v The Queen*, suggest an enthusiasm for the reception of incriminating *identification* evidence and indifference to the reliability of expert opinion evidence or the need to enforce boundaries between translation and identification<sup>16</sup>.

This generally permissive approach to incriminating opinion evidence was affirmed in *R v Madigan* (2005)<sup>17</sup>. Where, investigating police officers spent a total of 'maybe 50 hours, maybe more' listening to covert voice recordings. They replayed 'some tracks up to 20 times in an attempt to make out the words'. On the basis of this repeated listening they made transcripts and testified about the identity of the speakers. The admissibility of this evidence was contested. The Court of Criminal Appeal concluded, on the basis that the accused and others had effectively identified themselves in the incriminating recordings, that there was little risk that the jury might misuse or improperly value the impressions of the investigating police officers.

The most remarkable feature in the *Madigan* trial and appeal was the Court affirming the exclusion of the evidence of an expert witness called by the defendant. The defence sought to rely on the testimony of a linguist to describe alternative, and apparently more rigorous, approaches to voice identification than those employed by the investigating police.

In response, the Court of Criminal Appeal explained:

It does not however follow that the defence should have been permitted to call [a linguist] to give her expert opinion on the 'methodology'. . . . The defining point for the rejection of her evidence was that it did no more than identify an alternative method of voice identification that was dependent upon acoustic analysis, without placing in issue that which was led by the Crown.<sup>18</sup>

Ultimately, the defence expert's evidence was characterised by the Court as irrelevant. Challenging, directly or implicitly, the opinion evidence of the police

officers was not enough. To the extent that the defence were able to point to the existence of qualified experts from an emerging discipline – that is, technical voice comparison – able to describe notorious problems and more reliable approaches, this response seems difficult to reconcile with an accusatorial system interested in the fairness of its processes or factual accuracy. Here, it is important to emphasise that, I am talking about the exclusion of expert evidence adduced by the defence.

Before moving on I want to make it clear that, in the previous examples, none of the techniques used by the anatomists, linguists, interpreters and police had been tested, neither had any of the individuals. Furthermore, the opinions were not developed or obtained through processes that reduced the influence of contaminating information<sup>19</sup>. All of those offering opinions seem to have known the identity of the suspects and, in effect, confirmed suspicions<sup>20</sup>. Even though none of the witnesses had an idea about their level of accuracy, many were willing to testify that they were very confident, even certain, about their opinion.

We might wonder about what it is in police training or experience that prepares an officer for reliable voice identification. Similarly, are interpreters better at voice comparison and identification than others? What in the training of anatomists enables them to overcome the deficiencies and distortions in poorly resolved two-dimensional images such as to make reliable comparisons? With respect to anatomists, a technical vocabulary, experience with thousands of bodies, participation in previous investigations and trials is not a credible response. My point here is that the validity and reliability of the techniques and methods has not been established<sup>21</sup>. In all of these cases there was either no ‘specialised knowledge’ or no ‘specialised knowledge’ directly relevant to the process of identification.

The reluctance of lawyers and judges to genuinely engage with the validity and reliability of the techniques or the methods and bases underpinning these and other incriminating opinions has several serious implications for criminal proceedings<sup>22</sup>. Of particular concern is the burden they place on judicial discretions and other protections purportedly to make trials and appeals factually accurate and fair.

It is to these that I now intend to turn.

### 3. Judicial discretions

The exclusionary discretions, at common law based on *Christie*, have exerted almost no discernible impact on the reception of incriminating opinion evidence in recent years<sup>23</sup>. It might have been thought that section 137, would provide a practical means of excluding expert opinion evidence of unknown reliability. This, however, has not been the case.

Section 137 of the Uniform Evidence Law states:

**137 Exclusion of prejudicial evidence in criminal proceedings**

In a criminal proceeding, the court must refuse to admit evidence adduced by the prosecutor if its probative value is outweighed by the danger of unfair prejudice to the defendant.

The ‘probative value’ of evidence is its ability to rationally affect the probability of the existence of a fact in issue. ‘Unfair prejudice’ is the danger that the evidence might be improperly valued or misused by the finder of fact. In effect, the trial judge is required to balance incommensurables – the ability of the evidence to rationally influence the assessment of the facts against any real danger that the evidence might

be misused by the jury. If the danger outweighs the probative value then exclusion is mandatory.

Given the many weaknesses with voice identification and facial mapping evidence, we might have expected that evidence of unknown probative value would be outweighed by the danger of unfair prejudice to the accused – at least some of the time. However, section 137 does not afford much protection for defendants. In practice, judges are reluctant to determine the reliability of expert identification evidence when applying section 137 for fear of trespassing on the prerogatives of the jury. Rather than actually gauging the probative value of the opinion evidence and balancing it against real dangers of unfair prejudice to the accused, judges take the probative value of the incriminating expert evidence *at its highest*<sup>24</sup>. That is, the trial judge balances the danger of unfair prejudice against the maximum value that the opinion evidence could, *if accepted by the jury*, sustain.

So, without knowing about the validity or reliability of the opinion evidence, trial judges *assume* that experts (and others) can do what they claim and then consider what unfair prejudice to the accused might arise on the assumption that the opinions *are reliable*. This approach is structurally oblivious to the most serious prejudice associated with the admission of any opinion evidence. It ignores unreliability and the very real danger that the jury might actually rely upon unreliable identification evidence.

It probably will not come as a surprise but, to the extent that it actually features in the appeals I have mentioned, section 137 tends to play something of a cameo role.

#### 4. Trial ‘safeguards’

Judges tend to admit incriminating expert opinion evidence because they believe that problems with validity and reliability, like the credibility of the expert witness, can be productively explored through cross-examination, by calling rebuttal experts or managed through judicial directions and warnings. On closer examination, the effectiveness of these purported safeguards seems to be an article of faith<sup>25</sup>. There is little empirical evidence supporting the contention that cross-examination, rebuttal experts and directions are – individually or collectively – effective at consistently or fairly exposing problems and limitations with incriminating expert opinions<sup>26</sup>.

In practice, effective cross-examination and rebuttal experts are often just possibilities. Confidence in cross-examination and the restorative potential of defence experts assumes that defence lawyers are conversant with the technical detail and limitations with identification expertise, and capable of effectively conveying them to a lay jury (and judge). It also assumes that rebuttal experts can be identified and funded, and will be admitted. These are by no means guaranteed.

Ordinarily, the defence will be contesting the opinions of an experienced police officer or forensic scientist. In the absence of validation studies and standardised techniques, challenges to incriminating expert opinions will often appear to be *ad hominem*. It will be the opinion of an experienced investigator or scientist, carefully integrated into an incriminating prosecution narrative, against cross-examination or the opinion of a sceptical expert engaged by the defence. (The defence expert will rarely have funding to undertake independent analysis of the evidence.) Often, the expert witness called by the prosecution – such as the anatomist in *Tang* and the interpreters and linguists in *Li* and *El-Kheir* – will appear to have no stake in the case. Defence lawyers and rebuttal experts, in contrast, appear to have conspicuous

interests regardless of their independence or the quality of their evidence and critique.

In addition, judicial directions and warnings seem to have limited potential in combating problems with expertise. Virtually all of the experimental studies and empirical research suggests that judicial directions and instructions are difficult to follow, especially when presented seriatim at the end of the trial<sup>27</sup>. Judges can warn the jury about some of the dangers with expert identification evidence but if judges are willing to admit unreliable forms of expert evidence then there may be genuine questions about their ability to appreciate the magnitude of the dangers as well as effectively convey them to a jury. After all, problems with opinion evidence, especially opinions about identity (and similarity), are often conceptually and statistically complex.

None of this should be understood to suggest that cross-examination and rebuttal experts cannot, on occasion, be highly effective. Similarly, judicial instructions might occasionally inform jury decision making. This, however, does not provide adequate grounds for making them the primary protections against the opinions of investigators (and others) masquerading as ‘specialised knowledge’.

Admission privileges the state by allowing the prosecution to adduce evidence, of little or unknown probative value, and then requiring the defence to somehow negate it. This represents a highly improper form of burden shifting. Why should the defence be obliged to demonstrate unreliability instead of the state being required to establish that incriminating opinion evidence is reliable?

### 5. Abandoning (expert disagreement to) the jury?

On the jury: I do not doubt their ability to approach conflicting expert evidence in a considered fashion<sup>28</sup>. (However, questions about lay scientific literacy are for another occasion). My concern is whether all incriminating *expert* opinion and all conflicts of *expert* opinion should be left for the jury to resolve. It is my contention that too much controversial expert opinion evidence is simply abandoned to the jury. The jury’s fundamental Constitutional role is not undermined by: the exclusion of unreliable expert evidence; the exclusion of expert evidence of unknown reliability; or by putting the state to proof. There is no Constitutional problem (at least in the US, England and Canada, more below) with limiting jury responsibility to weighing expert opinion evidence once the prosecution has demonstrated that its incriminating opinion evidence satisfies a reliability threshold. Such an approach would better balance the accused’s right to a fair trial with meaningful public participation.

Furthermore, it makes little sense to say that the probative value of expert evidence is whatever weight a jury ascribes. Where we can determine the value of techniques or assess the capabilities of forensic scientists (and others) we should not prefer jury impressions, whether principled or speculative. When determining admissibility, privileging jury prerogatives over validation studies and other indicia of reliability tends toward the irrational.

### 6. Recent reforms to civil procedure

Because Peter McClellan agreed to comment on this paper, I want to develop some of these issues in relation to recent procedural reforms to expert evidence.

While I recognise that many of the recent reforms have been developed primarily in the civil sphere, there are whispers about their extension to the criminal justice system.

Here, I want briefly to mention codes of conduct and concurrent evidence. It is not my intention to suggest that these reforms are without value, but rather to explain how attention to reliability tends to illustrate their practical limitations and the subservience of concerns about ‘partisanship’ and ‘efficiency’ to factual rectitude and sometimes fairness.

### 6.1. Codes of conduct

Codes of conduct, now routinely completed by experts engaged in civil and criminal proceedings, confirm judicial antipathy toward partisanship (i.e. adversarial bias) and make the expert witnesses’ duty to the court unambiguous. For example:

#### 2 General duty to the court

- (1) An expert witness has an overriding duty to assist the court impartially on matters relevant to the expert witness’s area of expertise.
- (2) An expert witness’s paramount duty is to the court and not to any party to the proceedings (including the person retaining the expert witness).
- (3) An expert witness is not an advocate for a party.

They also require an expert report and testimony to include:

#### 5 Experts’ reports

- (1) ...
  - (b) the facts, and assumptions of fact, on which the opinions in the report are based ...
  - (c) the expert’s reasons for each opinion expressed,
  - (d) if applicable, that a particular issue falls outside the expert’s field of expertise,
  - (e) any literature or other materials utilised in support of the opinions,
  - (f) any examinations, tests or other investigations on which the expert has relied, including details of the qualifications of the person who carried them out ...
- (2) If an expert witness who prepares an expert’s report believes that it may be incomplete or inaccurate without some qualification, the qualification must be stated in the report.
- (3) If an expert witness considers that his or her opinion is not a concluded opinion because of insufficient research or insufficient data or for any other reason, this must be stated when the opinion is expressed.<sup>29</sup>

Notwithstanding the existence of formal codes, expert witnesses relied upon by investigators and called by the prosecution have not consistently referred to the lack of research in an area, the existence of limitations, or the need for testing, the unknown reliability of their opinions, the existence of alternative schools and critics, the range of methodological problems with their opinions, or precisely how their education, training and experience enables them to make the kinds of ‘identifications’ and comparisons presented in reports and testimony in court. Expert opinions are frequently expressed in language that dramatically underestimates *known* risks and dangers. The absence of validation studies is often disguised by reference to publications, study and experience of marginal relevance, although no studies or publications are included in many expert reports. Sometimes, those admitted as experts contend that those working alongside them have peer reviewed their results; even in the absence of validation studies, standardised procedures or blinding.

Emphasis on reliability is important because court rules, codes of conduct and professional guidelines do not seem to offer practical solutions to problems with expertise – including partisanship. They have not prevented incriminating expert opinion evidence of unknown reliability from entering serious criminal proceedings. This is an important observation because it suggests that codes and ethical precepts may be little more than aspirational. In all of the cases I mentioned earlier, an expert witness, or person granted the imprimatur of the expert, gave identification evidence in the shadow of these elaborate codes of conduct.

## 6.2. *Concurrent evidence*

In recent years, in civil proceedings and during the pre-trial voir dire in criminal trials, expert witnesses have begun to testify in concurrent evidence sessions. Concurrent evidence is known colloquially as ‘hot tubbing’<sup>30</sup>. It provides a forum where experts can give evidence in their own words and comment on the opinions of other experts during a joint session. In conjunction with pre-trial meetings, the aim is to reduce the extent of disagreement and encourage the various experts to agree or clearly explain the extent and reasons for their disagreement. It is designed to facilitate a professional conversation between the experts and to reduce the influence of lawyers and the incidence of partisanship.

Concurrent evidence may save time and money and may help judges (and other fact-finders) to understand the issues, the extent and reasons for disagreement, and to gauge the relations between experts. We have, however, very limited empirical information about its actual effects on costs and comprehension, let alone the quality of the evidence. There are few reasons to believe that it substantially reduces partisanship or improves the reliability of expert opinions. Concurrent evidence may change expert performances, but to the extent that experts conform to judicial expectations and engage in a more collegial discussion, this does not make the evidence or any consensus reliable or even more reliable.

Where the expert participants are not representative of fields or communities, or using validated methods and techniques, agreement and disagreement tells us little about the reliability of their opinions. Where the opinions are not demonstrably reliable, expert agreement or cooperative attitudes may actually mislead the court or tribunal. This is because two or more experts agreeing or narrowing the scope of disagreement in a concurrent evidence session is not the same as knowing about the validity and reliability of forensic science techniques and opinions. Information about validity and reliability is generally more important than expressions of cordiality and impressions of credibility. In addition, we should not forget that experts participating in concurrent evidence sessions do not always agree or behave civilly<sup>31</sup>.

I am not implacably opposed to any of the recent procedural reforms, but I think that their value is often exaggerated and some of the downsides trivialised<sup>32</sup>. Judicial proponents tend to exaggerate efficiency, accuracy and the levels of support from experts and lawyers.

Despite claims about the prevalence and impact of partisan experts, one revealing development, in the wake of the implementation of codes of conduct and other reforms, is the failure formally to identify, let alone sanction, partisan or incompetent experts. Experts are not disciplined even when they testify in very

confident terms based on techniques that have never been tested, simply invent levels of confidence and rates of error, and fail to disclose inconsistent or critical bodies of research.

## 7. International trends and some conclusions

Expert evidence has created difficulties for centuries<sup>33</sup>. Our existing admissibility jurisprudence and safeguards, many of which were developed decades ago, are poorly suited to contemporary criminal proceedings. Importantly, the lax approach to expert evidence, exemplified by the Court of Criminal Appeal in *Tang*, should be revised. Some version of ‘reliability’ must inform the jurisprudence regulating the admission of incriminating expert opinions based on ‘specialised knowledge’. Such an approach would place Australia in line with recent Anglo-American trends.

Significantly, ‘reliability’ was read into the equivalent of our section 79 by the Supreme Court of the United States in its *Daubert v Merrell Dow Pharmaceuticals, Inc.* (1993) and *Kumho Tire Co. v Carmichael* (1999) decisions. The language of the US *Federal Rules of Evidence* (1975) provides an instructive comparison with the UEL:

*Federal Rules of Evidence* 1975 (US)

Rule 702: ‘... scientific, technical and other specialized knowledge ...’

*Evidence Act* 1995 (NSW) and UEL

Section 79: ‘... specialised knowledge ...’

If we compare the way these phrases have been interpreted we can identify the very different responses to ‘specialised knowledge’ between the US Supreme Court:

*Daubert v Merrell Dow Pharmaceuticals, Inc.* 509 US 579, 597 (1993)

... [Federal] Rules of Evidence—especially Rule 702—do assign to the trial judge the task of ensuring that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands.

*Kumho Tire Co. v Carmichael* 526 US 137, 147 (1999)

In *Daubert*, the Court specified that it is the Rule’s word ‘knowledge,’ not the words (like ‘scientific’) that modify that word, that ‘establishes a standard of evidentiary reliability.’

And the NSW Court of Criminal Appeal:

*R v Tang* (2006) 65 NSWLR 681, [137]

The focus of attention must be on the words ‘specialised knowledge’, not on the introduction of an extraneous idea such as ‘reliability’.

It is not insignificant that, even after the *Daubert* and *Kumho* decisions, Rule 702 of the US *Federal Rules of Evidence* was revised to make the need for ‘reliability’ incontrovertible. Rule 702 now states:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in

the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

The US Supreme Court is not alone in this approach to the admissibility of expert evidence. Refining its admissibility jurisprudence over the last decade, the Supreme Court of Canada has begun to insist upon ‘reliability’. Originally, at least since *R v Mohan* (1994), the exclusionary discretions provided a basis for regulating the admissibility of incriminating expert opinion evidence. More recent decisions, however, such as *R v DD* (2000), *R v J-LJ* (2000) and *Re Truscott* (2007), have brought ‘reliability’ centre stage<sup>34</sup>. In *R v Trochym* (2007) the majority position on the admissibility of expert evidence was unambiguous:

*Reliability is an essential component of admissibility.* Whereas the degree of reliability required by courts may vary depending on the circumstances, evidence that is not *sufficiently reliable* is likely to undermine the fundamental fairness of the criminal process.<sup>35</sup>

A recent public inquiry into paediatric forensic pathology in Ontario (the Goudge Inquiry) arrived at similar conclusions. Responding to a series of wrongful convictions, Justice Goudge made the following recommendations:

A concern about the reliability of evidence is a fundamental component of the law of evidence. Threshold reliability plays an important role in determining whether proposed expert evidence is admissible under the *Mohan* test. Reliability can be an important consideration in determining whether the proposed expert evidence is relevant and necessary; whether it is excluded under any exclusionary rule, including the rule that requires evidence to be excluded if its prejudicial effect exceeds its probative value; and whether the expert is properly qualified. Trial judges should be vigilant in exercising their gatekeeping role with respect to the admissibility of such evidence. In particular, they should ensure that expert scientific evidence that does not satisfy standards of threshold reliability be excluded, whether or not the science is classified as novel.

And,

In determining the threshold reliability of expert scientific evidence, the trial judge should assess the reliability of the proposed witness, the field of science, and the opinion offered in the particular case. In doing so, the trial judge should have regard to the tools and questions that are most germane to the task in the particular case.<sup>36</sup>

In England and Wales, the Law Commission recently released a consultation paper describing four ways to revise admissibility standards in criminal proceedings. The Commission’s preferred approach is a reliability standard effectively mimicking *Daubert*.

Our view is that reform *is* needed. We provisionally propose:

- (1) that there should be a new statutory test for determining the admissibility of expert evidence in criminal proceedings, which would apply whether the evidence is tendered by the prosecution or by the accused;
- (2) this new test would provide that expert evidence is admissible only if the court is satisfied that the evidence is sufficiently reliable to be admitted; and

- (3) in determining whether or not the test is satisfied the court would in all cases have to refer to a statutory list of guidelines for assistance.<sup>37</sup>

There is, as these examples clearly demonstrate, no reason why we, in Australia, could not read 'reliability' into 'specialised knowledge'<sup>38</sup>. In addition, there is nothing preventing judges from considering the actual probative value of incriminating expert evidence when undertaking the balancing exercise mandated by section 137. If assessing reliability trespasses on the traditional prerogatives of the jury then that is the necessary price for a rational system of justice that values accuracy and fairness as well as public participation.

To be admissible, the expert evidence adduced and relied upon by the prosecution should be *demonstrably reliable*. What 'demonstrable reliability' (or 'sufficiently reliable') means is open for debate, but I would like to make three points. First, I have referred primarily to validation and error rates, but there are other, although usually less powerful, indicia of reliability. Where, the opinion evidence is of a kind that is unusual and not likely to proliferate there may be scope for demonstrating reliability in other ways. However, there is no justification for exempting incriminating expert opinion evidence from some reliability assessment, and the preference should always be for rigorous validation studies<sup>39</sup>.

Second, where a forensic technique is used repeatedly or is proliferating, as in the case of expert 'identifications' based on voice recordings and images, it is particularly important to require validation studies and error rates as a pre-condition to admissibility. It is both inefficient and unfair to require individual defendants to separately challenge the reliability of expert evidence over and over. Where evidence is of a kind that is likely to re-appear, forensic scientists should be rigorously testing their techniques and judges should be excluding opinions unless there is support for the underlying techniques.

Third, reliability assessments should focus on the technique and its accuracy (as well as the proficiency of the operator/analyst). Additional incriminating evidence should not be used to support the admission of techniques of unknown reliability<sup>40</sup>. Often, incriminating forensic science evidence (of unknown reliability) will not be genuinely independent of other circumstantial evidence and may be influenced by it. So, for example, where investigating police, interpreters or anatomists are told (explicitly or implicitly) who the suspect is before they make their identification they should not then be allowed to give identification evidence. Such evidence will be contaminated by this information and may be akin to a dock identification even though it will be presented, and may appear, as a legitimate and independent process of identification (by an expert or *de facto* expert).

In the cases I have mentioned – and virtually every other case involving forensic science – there was other incriminating, and sometimes compelling, evidence. I do not mean to suggest that the individuals prosecuted were innocent. Rather, my point is that where the incriminating opinion evidence is unreliable or of unknown reliability, the overall strength or weakness of the case should not be used to mediate the admissibility of forensic science evidence. Forensic science techniques must stand or fall on their own.

Where there is no discipline or profession able to reliably interpret voices or images, courts should not allow those with expertise from adjacent fields or with non-specific experience to assert their untested opinions. We should not assume that police and interpreters have special sensory prowess. And, we should not be

encouraging investigating police officers (and others) to listen to voice recordings or replay videos over and over so they can give ‘identification’ evidence<sup>41</sup>. Recourse to the concept of the *ad hoc* expert – that is, amateurs who become ‘experts’ through repeated exposure to voice recording or images – should be abandoned. Expediency and convenience, or even concerns about efficiency, should not overcome the more fundamental question of reliability and the difficulty of practically contesting this evidence<sup>42</sup>.

In an accusatorial system the prosecution should not obtain the benefit of uncertainty or epistemological apathy, or the practical weakness and inconsistent operation of the trial safeguards it routinely valorises. Doubt and uncertainty should accrue to the accused. Our system was not designed to accommodate the bare opinions of investigators and experts as proof of guilt. The opinions of investigators (and interpreters) and highly qualified individuals trespassing beyond the legitimate scope of their expertise should not be used as a makeweight for (or to gild) the prosecution case.

Despite my emphasis on facial mapping and voice identification evidence, there are serious reliability problems with virtually all of the identification sciences. In its recent review of forensic sciences in the US, the National Research Council (of the National Academy of the Sciences) concluded that:

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<sup>43</sup>.

Notwithstanding this state of affairs – as applicable to Australia as the US – voice identification, identification from images, handwriting evidence, footprints, hair comparison, gait, bite marks and latent fingerprints are all routinely admitted and relied upon in Australian criminal proceedings. In many of these cases, similarities have assumed the place of identity – often in the absence of validation studies or credible information about base rates and rates of error<sup>44</sup>.

The National Academy of Science’s Report lends authoritative weight to my general concerns. Although focused on the US, the Committee concluded that:

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.<sup>45</sup>

And, among the Recommendations, we find:

Recommendation 3: Research is needed to address issues of accuracy, reliability and validity in the forensic science disciplines.<sup>46</sup>

Interestingly, the Committee of the National Academy of Sciences did not propose procedural solutions, such as concurrent evidence or the use of court-appointed experts<sup>47</sup>. Rather, they placed emphasis fairly and squarely on ‘accuracy, reliability and validity’. To the extent that concurrent evidence has a role to play in Australian criminal trials it should be subservient to the application of a reliability threshold or used, on the *voir dire*, to determine the admissibility of incriminating expert opinion evidence. Codes of conduct and concurrent evidence (and court-appointed experts) seem to privilege costs, speed and ease of decision making over reliability. They do not necessarily address the reliability of expert opinion evidence. In criminal

proceedings factual accuracy needs to be tempered against both efficiency and fairness.

Finally, it is important to recognise that a reliability standard – whether *Daubert*, ‘threshold reliability’, ‘demonstrable reliability’ or ‘sufficiently reliable’ – does not represent a complete solution to problems with incriminating expert evidence, especially the organisation and funding of the institutionalised forensic sciences<sup>48</sup>. What is now required, apart from a considerable escalation in research, is genuinely multidisciplinary engagement to reform both the forensic sciences and our approach to forensic science evidence. Significantly, no single professional group – whether lawyers, scientists and other experts, judges or social scientists – have all, or even most, of the answers. And, this is where peak organisations, such as this Academy, can play constructive and continuing roles.

For it is only through collaboration between lawyers and non-lawyers that we can hope to develop rules and procedures that have any chance of effectively protecting the innocent, identifying and convicting the guilty, and making our criminal justice institutions more socially and scientifically legitimate.

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