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EXPERT EVIDENCE IN CRIMINAL COURTS – THE PROBLEM

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Introduction

I am both privileged and delighted to have been invited to deliver this talk although I do so with some trepidation not only because of the presence of such distinguished practitioners and academics but also because the Law Commission is about to issue a definitive paper on the subject of expert evidence and I have no wish to cut across that work not least because I hope and trust that it will help to resolve our uncertainty as to the way forward.

For my part, I would like to set this lecture in context by briefly discussing the role and duties of expert witnesses, before I turn to consider the current approach of English law in this area and the problems associated with it. I shall then offer some insight into where we go from here – what can be done to improve the reliability and use of expert evidence in law and, beyond refining this test, what else can be done.

Experts generally

There can be no doubt that whereas once, going to an expert was rare, now it is commonplace. Expert opinion evidence is only admissible on a matter calling for expertise but the field of expertise is large and ever-expanding, encompassing a range of subjects as diverse as blood tests, ear-print identification, facial mapping, voice identification, sudden infant death syndrome and lip reading; I was involved in one particular case concerning a very substantial oil spillage which led me into issues of pilotage, marine architecture and

economics; I have also seen expert generated computer graphics to depict the course of a fire. Expertise has, however, proliferated in ways we ought to be careful about.

There have been increasing concerns that in certain circumstances expert evidence has been incorrectly used, or too much significance has been ascribed to it. This problem was highlighted recently by the Court of Appeal (Criminal Division) in *R v Atkins* [2009] EWCA Crim 1879. The Court noted three factors about expert evidence which should be borne in mind throughout. First, expert opinion is just that: an opinion. Second, experts need to know the limits of their expertise and have the integrity to inform the Court of those limits. Third, expert evidence should – indeed must – be submitted to robust testing, either by another witness in the same field or in relation to accepted scientific methodology for the science and statistical analysis for probability.

Role and duties of experts

Further, as science and technology have become more complex, the role of the expert has become increasingly important. More and more, the expert is someone with considerable experience in giving expert evidence, whose work as an expert is not an insignificant source of income. The testimony of an expert is likely to carry more weight, and more readily relate to an ultimate issue, than that of an ordinary witness. In addition, parties look increasingly towards experts as a panacea, a fix all, a universal solution to the evidence – or lack of evidence – in the case. Consequently it is unsurprising that higher standards of accuracy and objectivity should be required of them.

In *National Justice Compania Naviera S.A. v Prudential Assurance Co Ltd ("The Ikarian Reefer")* [1993] 2 Lloyds Rep 68, Cresswell J summarised the duties and responsibilities of experts[1]. Whilst decided in the context of civil proceedings, these

[1] At paragraphs 81-82: "The duties and responsibilities of expert witnesses in civil cases include the following: (1) Expert evidence presented to the court should be, and should be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of litigation (*Whitehouse v Jordan* [1981] 1 WLR 246 , 256, per Lord Wilberforce). (2) An expert witness should provide independent assistance to the court by way of objective unbiased opinion in relation to matters within his expertise (see *Polivitte Ltd v Commercial Union Assurance Co plc* [1987] 1 Lloyd's Rep 379 , 386, per Garland J and *In re J* (Child Abuse: Expert Evidence) [1991] FCR 193 , per Cazalet J). An expert witness in the High Court should never assume the role of an advocate. (3) An expert witness should state the facts or assumption upon which his opinion is based. He should not omit to consider material facts which could detract from his concluded opinion (*In re J*). (4) An expert witness should make it clear when a particular question or issue falls outside his expertise. (5) If an expert's opinion is not properly researched because he considers that insufficient data is available, then this must be stated with an indication that the opinion is no more than a provisional one (*In re J*). In cases where an expert witness who has prepared a report could not assert that the report contained the truth, the whole truth and nothing but the truth without some qualification, that qualification should be stated in the report (*Derby & Co Ltd v Weldon* The Times, 9 November 1990, per Staughton LJ). (6) If, after exchange of reports, an expert

guidelines apply in relation to all types of litigation[2]. I shall not relay the detail of Cresswell J's guidelines to you now – suffice to say that, in essence, they amount to a general duty for the expert to advise the judge, to undertake assessment, to give an opinion and consult with other experts, all which should be done in a spirit of honesty, integrity and objectivity. This view of the role of the expert has received emphatic expression in Part 35 of the Civil Procedure Rules and in Part 33 of the Criminal Procedure Rules. In addition, both sets of rules emphasise that the expert's duty is to the Court, and not to the party hiring them.

In practice, an expert's primary duty to the Court should help them view and pursue the underlying philosophy of case management as an integral part of their duty. Experts should understand the rules of procedure, the overriding objectives, directions hearings and time limits. Above all, they should be alive to the impact that a sensible approach can have on all of these elements and to the conduct of the case generally.

Current approach in England and Wales

In turning to look at the current approach in England and Wales to the admissibility of expert evidence, I start with the observations of King CJ in the South Australian case of *R v Bonython* (1984) SASR 45, who said that, in determining the admissibility of expert evidence, a judge should have regard to the following factors:

(1) whether the subject matter of the opinion is likely to be outside the experience and knowledge of a judge or jury;

(2) whether the subject matter of the opinion forms part of a body of knowledge or experience which is sufficiently organised or recognised to be accepted as a reliable body of knowledge or experience (i.e. the subject matter of the expert witness's opinion should be sufficiently reliable to justify the admission before the jury of an expert opinion founded on it); and

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witness changes his view on a material matter having read the other side's expert's report or for any other reason, such change of view should be communicated (through legal representatives) to the other side without delay and when appropriate to the court. (7) Where expert evidence refers to photographs, plans, calculations, analyses, measurements, survey reports or other similar documents, these must be provided to the opposite party at the same time as the exchange of reports (see 15.5 of the Guide to Commercial Court Practice)."

[2] In *R v Harris* [2006] 1 Cr App R 55, it was held that Cresswell J's guidelines were very relevant in criminal proceedings.

(3) whether the expert witness has sufficient knowledge and experience to justify having his or her opinion placed before the jury as an expert opinion on the relevant matter.

Despite the frequency with which this test has been cited with approval (both by academics[3] and by judges[4]), only the first and third limbs of this test can be said to represent the current state of English law, along with a fourth requirement that the expert must be capable of providing an impartial opinion[5]. These three requirements are relatively uncontroversial. That is not to say there are not occasional problems in their application, but that the rules themselves are fundamentally sound and readily comprehensible.

Whilst there are notable exceptions[6], there remains a general reluctance on the part of judges to ensure that what I shall term the "reliable body of knowledge or experience" condition forms part of the test of admissibility. Indeed, the current legal position in relation to reliability is that the expert evidence in question must be "sufficiently well-established to pass the ordinary tests of relevance and reliability"; in other words, it must be sufficiently reliable to be fit for a jury to consider.

However, there is little judicial guidance and certainly no consistent guidance on how sufficiency of reliability is to be determined for expert evidence at the admissibility stage. The Court of Appeal attempted to establish a framework in *R v Gilfoyle (No 2)* [2001] 2 Cr App R 57, with reference to the decision in *Frye v United States* 293 F 1013 (D.C. Cir 1923), where it was observed that expert evidence based on a developing new brand of science or medicine is not admissible until accepted by the scientific community as being able to provide accurate and reliable opinion.

Gilfoyle itself was a murder case in which the deceased was found hanging in the garage of the home she shared with the defendant. The defence sought to rely on evidence of "a distinguished psychologist" to the effect that it was likely that the deceased's state of mind prior to her death was such that she was likely to have committed suicide. The psychologist specialised in the "systemic analysis of human behaviour in order to identify the dominant strands within it". The Court of Appeal held that so called "psychological autopsy" was a

[3] See, for example, *Cross & Tapper on Evidence* (11th edition), p.582 (fn.172)
[4] See, for example, the Court of Appeal decisions in *R v Hodges* [2003] EWCA Crim 290 and *R v Dallagher* [2003] 1 Cr App R 195
[5] *Field v Leeds City Council* [2001] 2 CLPR 129
[6] See, for example, *R v Gilfoyle* [2001] 2 Cr App R 57

developing, new brand of science or medicine that was not accepted by the scientific community as being able to provide an accurate and reliable opinion.

Whilst *Gilfoyle* appeared to move towards acceptance of the "reliable body of knowledge or experience" condition, it sits uneasily with other authorities and with the established common law principle that there are no closed categories where expert evidence may be placed before a jury[7]. In particular, it is difficult to see how *Gilfoyle* can be reconciled with the approach taken in *R v Robb* (1991) 93 Cr App R 161, which has recently been affirmed by *R v Dallagher* [2002] EWCA Crim 1903.

In *Robb* the Court of Appeal upheld the trial judge's decision to admit the evidence of a well-qualified phonetician notwithstanding the fact that his auditory technique was not generally respected by other experts in the field because it was not supplemented and verified by acoustic analysis. This is consistent with Australian jurisprudence, which has long accepted that a minority view in a recognised discipline can nevertheless be admissible as expert evidence[8]. Bingham L.J. (as he was then) appeared to reduce the test for admissibility down to two limbs: (1) whether study and experience give the witness's opinion an authority that the unqualified will lack; and (2) whether the witness in question is *peritus* – in other words, whether the witness has undertaken the necessary study or gained the necessary experience. There was no "reliable body of knowledge or experience" condition.

The problem with the *Robb* approach to the question of admissibility is aptly illustrated by the following example. The opinion of an experienced astrologer with many years of study and practice in the field of astrology would undoubtedly have an authority about astrological matters which the unqualified would lack. However, it is inconceivable that such a witness would be allowed to give evidence to the effect that a defendant was not guilty of murder by reason of the relative position of particular celestial bodies. I accept this may be a rather extreme example, but it serves to demonstrate the importance of the "reliable body of knowledge or experience" condition. For it is the requirement of reliability that prevents astrologers, soothsayers and witch doctors giving evidence in proceedings under English law: I doubt that anyone would argue that such fields of expertise are sufficiently organised or recognised to be accepted as reliable on this issue.

In summary, the current approach of the law of England and Wales to the "reliable body of knowledge or experience" condition appears to be that:

[7] *R v Clarke* [1995] 2 Cr App R 425
[8] *Commissioner for Government Transport v Adamcik* (1961) 106 CLR 292

(1) Expert evidence is clearly inadmissible as a matter of law if, patently, it lacks even prima facie reliability.

(2) Equally clearly, there are some scientific theories or laws that are so well established that judicial notice may be taken of their validity and therefore reliability. In *Robb* Bingham LJ noted[9] that "the old-established, academically-based sciences such as medicine, geology or metallurgy, and the established professions such as architecture, quantity surveying or engineering, present no problem", but his Lordship acknowledged that "expert evidence is not...limited to these core areas."

(3) All other expert evidence is covered by the general relevant and reliability test.

It is this third category is where most forensic scientific expertise is likely to fall in practice, yet judges have been provided with no guidance whatsoever to assist them in the determination of evidentiary reliability. Moreover, it appears that our courts have adopted a *laissez-faire* approach and, in effect, will permit expert evidence to be called so long as it is not patently unreliable, so that juries and indeed judges are not denied access to material which might be helpful in reaching their ultimate conclusions.

Problems with the current approach

Let me now consider the problems with our current approach. As I indicated earlier, there exists a real difficulty that just because an expert's evidence is presented as "scientific" it may be taken to be reliable. There is evidence to suggest that juries may find it difficult to understand or follow cross-examination aimed at revealing flaws in scientific methodology, and arguably even more difficult to then determine how much weight to attach to such evidence. Further, where a field of expertise is particularly difficult to comprehend, although it will be easier for a judge, it could be – and I do not say more – that a jury may simply defer to the knowledge and opinion expressed by a convincing expert when considering how to resolve the issues in dispute. The possibility or likelihood of jury deference in relation to complex fields of knowledge gives rise to a particular danger if there are legitimate, but unresolved, questions about the reliability of that expert evidence. I want to split reliability issues into two broad categories – the first is where an expert's field of knowledge is a novel

[9] At paragraph 164

or developing science with little in the way of peer review, and the second is where there are doubts as to the validity of the expert's methodology, hypothesis or assumptions.

(i) Novel or developing sciences

Let me first deal with novel or developing sciences. What can be done about a new expertise focussed in only a few experts who might have developed it collaboratively and who, therefore, are likely to look at the same problem in broadly the same way with the result that the opposing side does not have the advantage of a contrary view from an equally qualified expert? Is the fact that there is no equality of arms, no potentially equal and opposite evidence to hand sufficient to give rise to such concern that the evidence should not be admitted?

My view is that there is no such thing as an unchallengeable expert. True it is, there may not be an expert witness whose expertise is in precisely the same field as that of the witness but there are many who have sufficient general scientific expertise and the ability to express it in court, who can subject the underlying science to general scrutiny and, perhaps, verification. Other scientists from the same field, albeit not forensically minded, would be able to speak of the assumptions and the general science on which the conclusions are based and, to such extent as reliance is placed on any statistical analysis, statisticians will be able to challenge any assumptions in that field.

That is not to say that I do not recognise the dangers of this approach, if those considering such evidence are not sufficiently rigorous. A good example of the danger of admitting evidence based on a new and developing science without such scrutiny can be found in the case of *R v Dallagher* [2002] EWCA Crim 1903. Mark Dallagher's conviction for murder was based almost entirely on prosecution expert testimony relating to the comparison of an ear print made by Mr Dallagher with a latent ear print found on a window at the scene of the crime. At trial, one of the experts opined that he was "absolutely convinced" that Mr Dallagher had left the print found at the scene. A second prosecution expert his trial was willing to countenance only a "remote possibility" that the print had been left by someone else.

The expertise of ear print comparison is in its relative infancy, and following the trial, fresh evidence cast doubts on the extent to which ear print evidence alone could safely be used to identify a suspect. Mr Dallagher's conviction was quashed and at his second trial the prosecution had no choice but to drop its case against him as DNA evidence taken from the

latent print unequivocally established that it had been left by someone other than Mr Dallagher. In quashing his conviction, the Court of Appeal did not find any merit in the submission on behalf of Mr Dallagher's defence that the experts' opinions should have been ruled inadmissible on account of the inherent unreliability of inferences drawn from ear print matches. Instead, it was held that, despite the fact that it was a minority view, the expert evidence was properly admitted – in this way, *Dallagher* affirmed the *Robb* approach[10].

I ought also to mention *R v Cannings* [2004] EWCA Crim 1. Angela Cannings was convicted of the murder of two of her four children, three of whom died shortly after their births. The Crown's case, for which there was no direct evidence, was that Mrs Cannings had smothered all three of the children. Their case depended on expert evidence that the conclusion of smothering could be drawn from the extreme rarity of three separate infant deaths in the same family. The Court of Appeal quashed Mrs Cannings' convictions after developments in the understanding of sudden infant death syndrome, also known as cot death, showed that it might have a genetic component and that the occurrence of more than one sudden infant death in one family was not as rare as the Crown had presented at trial. Lord Justice Judge (as he then was), delivering the judgment of the Court of Appeal said[11]:

> "With unexplained infant deaths, however, as this judgment has demonstrated, in many important respects we are still at the frontiers of knowledge. Necessarily, further research is needed, and fortunately, thanks to the dedication of the medical profession, it is continuing. All this suggests that, for the time being, where a full investigation into two or more sudden unexplained infant deaths in the same family is followed by a serious disagreement between reputable experts about the cause of death, and a body of such expert opinion concludes that natural causes, whether explained or unexplained, cannot be excluded as a reasonable (and not a fanciful) possibility, the prosecution of a parent or parents for murder should not be started, or continued, unless there is additional cogent evidence, extraneous to the expert evidence...which tends to support the conclusion that the infant...was deliberately harmed."

Whilst these cases aptly demonstrate the problems associated with admitting expert evidence based on novel or developing sciences, they fail to propose a consistent approach

[10] The admissibility of ear-print evidence was recently reconsidered in *R v Kempster (No 2)* [2008] EWCA Crim 975. As in *Dallagher*, the police had recovered an ear-print from one of the windows in the premises which had been forced and the expert who gave evidence at the trial contended that the ear-print found on the window pane matched ear-prints subsequently taken from the defendant. At the appeal hearing, it was held that ear print comparison is capable of providing information which could identify the person who had left such a print on a surface, where minutiae could be identified and matched. Minutiae are small anatomical features such as notches, nodules or creases in the ear structure. However, in cases where the only information came from gross features (the main cartilaginous folds), there is likely to be less confidence in such a match, because of the flexibility of the ear and the uncertainty of the pressure which would have been applied at the relevant time.

[11] At paragraph 178

towards the admissibility of such evidence. I do not deny that there is considerable force in the argument that a better approach may be to ensure that expert evidence in pioneering areas of medical or scientific development should not be admitted until the developing area is sufficiently organised or recognised to be accepted as a reliable body of knowledge and experience.

(ii) Doubts as to the validity of the expert's methodology, hypothesis or assumptions

A second category of reliability issues is the situation where there is no doubt about the expertise of the experts but there are, or at least should be, doubts as to the validity of his or her methodology, hypothesis or assumptions. Closely intertwined with this is the problem of experts straying outside the particular area of their expertise.

Perhaps the most high profile and indeed interesting case to mention in this respect is that of *R v. Clark (Sally) (No 2)* [2003] EWCA Crim 1020. Mrs Clark was accused of murdering her two young sons, Christopher, 11 weeks, and Harry, eight weeks, who died within 13 months of each other between December 1996 and January 1998. She was alone with both children at the time of their deaths at home. Mrs Clark claimed that her children had died of sudden infant death syndrome but at trial she was convicted of their murders. It was later decided by the Court of Appeal that those verdicts were unsafe due to material non-disclosure by the Crown's pathologist. The Court also considered that the appeal would "in all probability" have also been allowed on an alternative ground focused on criticisms of the evidence of Professor Sir Roy Meadow.

Professor Meadow was an eminent and respected paediatrician, and an experienced expert witness[12]. At the trial of Mrs Clark, he was asked about some statistical information as to the happening of two cot deaths within the same family. His research on the matter was about to be published in a report of a government funded multi-disciplinary research team - the Confidential Enquiry into Sudden Death in Infancy. Professor Meadow said that it was at that time "the most reliable study and easily the largest and in that sense the latest and the best" ever done in the UK. Consequently his evidence was delivered with a high degree of authority.

[12] Professor Meadow has also given evidence in, amongst others, the high profile cases of *R v Cannings* [2004] EWCA Crim 1; *R v Anthony* [2005] EWCA Crim 952; and *R v Patel* (unreported, Jack J and jury at Reading Crown Court, 11 June 2003).

In his evidence, and on the basis of the report, Professor Meadow stated that the chance of one cot death in an affluent, non-smoking family like the Clarks' was 1 in 8,543. He then squared this to reach the figure of 1 in 73 million for two cot deaths, adding that such an occurrence would happen "once in every 100 years" and that the odds of both children dying from natural deaths could be compared to four different horses winning the Grand National in consecutive years at odds of 80 to 1. It is unsurprising that, when viewed in that light, Mrs Clark's claim that that her children had died of sudden infant death syndrome was received with great suspicion despite efforts from the trial judge to down play this aspect of Professor Meadow's evidence.

The statistical evidence given by Professor Meadow was plainly not within the area of his expertise. In ultimately quashing Mrs Clark's convictions, the Court of Appeal held that, notwithstanding the inaccuracy of Professor Meadow's statistic, it was unfortunate that the trial did not feature any consideration as to whether such evidence should be admitted in evidence: by no stretch of the imagination could be he called an expert statistician. It was further accepted that there was in fact evidence to suggest that the figure of 1 in 73 million grossly misrepresented the chance of two sudden cot deaths. This was particularly so in light of Professor Meadow's failure to consider genetic and environmental factors. Indeed, it subsequently transpired that there were infections in the two children and some degree of genetic predisposition to their untimely deaths. Here is a paradigm example of the case where scientific challenges to these areas of the evidence, whether or not by an expert in Sudden Infant Death Syndrome, would have made a crucial difference.

After the recent Court of Appeal decision in *Henderson, Butler, Oyediran* [2010] EWCA Crim 1269, perhaps Professor Meadow's evidence in Mrs Clark's case would viewed in a less authoritative light today. Professor Meadow retired from clinical practice in 1998. In *Henderson, Butler, Oyediran* Lord Justice Moses, delivering the judgment of the Court, emphasised that the fact that an expert is in clinical practice at the time he makes his report is of significance (at para. 208):

> "Clinicians learn from each case in which they are engaged. ... Each case makes them think and as their experience develops so too does their understanding. Continuing experience gives them the opportunity to adjust previously held opinions, to alter their views. They are best placed to recognise that that which is unknown one day may be acknowledged the next".

Moses LJ said that such evidence could provide a "far more reliable source" than that of medical experts who had retired, since they have "lost the opportunity, day by day, to learn and develop from continuing practice".

Following the quashing of Mrs Clark's conviction, her father made a complaint against Professor Meadow to his regulator, the General Medical Council ("GMC"), alleging serious professional misconduct in respect of the evidence he gave. I mention these proceedings as they serve to highlight the profession position – the other side of the coin, so to speak. The tragic consequences for Mrs Clark of Professor Meadow's evidence are readily apparent, but what of the consequences for Professor Meadow himself?

The GMC found that serious professional misconduct was proved despite a finding that he had acted in good faith. Professor Meadow's name was ordered to be erased from the medical register. On appeal to the High Court it was argued, *inter alia*, that Professor Meadow was immune from such proceedings in respect of evidence given in Court. Rather controversially, this argument was accepted by Mr Justice Collins but was rejected by the Court of Appeal which confirmed that it was lawful for the GMC to consider and determine the complaint. Crucially for expert witnesses, it was held that there was no principled basis to extend common law immunity from suit of a witness to fitness to practise proceedings because the purpose of such proceedings was to protect the public: if the conduct of an expert witness raised the question whether that expert was fit to practise in his particular field, then the regulatory authorities should be entitled and might be bound to investigate and determine such proceedings against the expert.

The possibility that experts who give evidence to Courts may be disciplined and lose their livelihood even if reports have been prepared and their evidence has been given in good faith and with no intention to mislead is understandably worrying for professionals. However the Court of Appeal's decision does not change the law, it merely reinforces the fact that experts in their reports and evidence should never stray outside the particular areas of their expertise. If they are invited to do so in their instructions to advise or in evidence, they should either decline the invitation, or make it very clear to the judge that the area on which they are being invited to comment is not one to which their particular expertise extends. All three judges in the Court of Appeal repeat this message, and all three refer with approval to the decision of Cresswell J in *The Ikarian Reefer*, to which I have already referred.

Another notable example of experts straying beyond their particular area of expertise can be seen in the Australian case of *R v Tang* [2006] NSWCCA 167. In *Tang*, an expert in one field, facial comparison, sought to give evidence in relation to another field, body posture. The expert went as far as to say that the body posture alone of the defendant was, and I quote, a "unique identifier" which "leant support" to her conclusion that the defendant

and the person responsible for the crime were "one and the same". The expert was unable to identify a body of knowledge to establish that proposition. When pressed, she stated that she had indeed established her own "protocol" for the comparison of different body postures. She refused, however, to reveal any details of the "protocol" on the grounds that it was unique to herself and she wished to patent it.

Whilst the decision of the New South Wales Court of Criminal Appeal to order a retrial was perhaps unsurprising, the importance of *Tang* lies in its analysis of the admissibility of expert evidence. Chief Justice Spigelman emphasised that the focus of admissibility decisions under the Uniform Evidence Acts should be upon "specialised knowledge" rather than what he termed "an extraneous idea such as 'reliability'". He applied the definition of knowledge utilised in *Daubert v Merrell Dow Pharmaceuticals* 509 US 579 (1993) where knowledge was held to mean more than subjective belief or unsupported speculation. Such an approach would preclude the advancing of mere assertions and hypotheses under the cover of expert status. Moreover it could go as far as requiring judges to assess the evidentiary reliability of the tendered evidence by applying the "reliable body of knowledge or experience" condition as part of the test of admissibility.

Turning to my next example, that of DNA profiling, I hope to demonstrate that even where an expert remains within his area of expertise, doubts as to the reliability of his evidence can persist on the basis of the validity of the scientific technique used.

As you are no doubt aware, DNA profiling has revolutionised the use of science in legal cases. DNA profiles produced from manufactured kits are routinely used as evidence; these kits operate within a specific range of amounts of DNA, typically 0.5 – 2.5 nanograms. However, some claim that by varying the conditions under which the kit is used profiles can be produced from much lower amounts of starting or template DNA. This technique has become known as Low Copy Number ("LCN") DNA analysis. The LCN technique was specifically designed to analyse amounts of DNA below 0.1 nanograms (100 picograms) and to produce reliable profiles even in the presence of stochastic effects.

There has been for some time controversy about the use in the courts of England and Wales of LCN DNA evidence. With very low numbers of template DNA molecules the process may fail to amplify the template which can lead to a number of problems in the interpretation of the resulting profiles. These are caused mostly by sampling, or stochastic, errors caused by the failure of the chemistry to work effectively with such low numbers leading to poor reproducibility of the results.

The combined appeals of *R v Reed and Reed, R v Garmson* [2009] EWCA Crim 2698 challenged the use of LCN DNA analysis as an evidentiary tool. In two different cases, the Appellants appealed against their convictions to the Court of Appeal. The Reed brothers had been convicted of murder, and the forensic scientist in their August 2007 case at Teesside Crown Court had used LCN testing on two pieces of plastic fragments found at the murder scene. Similarly, in Mr Garmson's trial for kidnap, rape and sexual assault, LCN testing was used in respect of DNA found on four items.

Following the Appellants' convictions, in Northern Ireland, Mr Justice Weir rejected a case against a man charged with the Omagh bombing of 1998, saying that the LCN DNA technique had questions about its validity as admissible evidence. That led to the temporary suspension of the LCN technique as the Home Office carried out a review of its applicability for court purposes. In early 2008, that review concluded that it was scientifically robust and therefore appropriate for court cases. The Court of Appeal confirmed this approach in the *Reed* and *Garmson* appeals.

Lord Justice Thomas held, in dismissing the appeals, that LCN DNA could be used to obtain profiles capable of reliable interpretation if the quantity of template DNA was above a minimum stochastic threshold of between 100 and 200 picograms. In cases within the range of 100 to 200 picograms, evidence might be necessary as to whether in a particular case a reliable interpretation could be made. However, subject to the emergence of further evidence on DNA scientific reliability, a challenge to the validity of the LCN technique should no longer be permitted at trials where the stochastic threshold is exceeded. Furthermore, evidence from a forensic science officer with scenes of crime experience was admissible to give possible explanations for the presence of DNA where it had been found and to evaluate those possibilities.

However it is not exclusively in the areas of novel or developing sciences where doubts have been raised as to an expert's methodology, hypothesis or assumptions.

Fingerprint technology, unlike facial mapping, DNA profiling or ear-print identification, is a century old identification process. Indeed, fingerprint identification is often considered to be virtually unassailable evidence tying a person to a crime. Yet the reliability of fingerprint identification has recently come under scrutiny following numerous

cases of 'false positive' fingerprint identification, in which an innocent person is singled out erroneously[13].

There is growing unease among fingerprint examiners and researchers that the century old fingerprint identification process rests on assumptions that have never been tested empirically. The US National Academy of Sciences has recently found that long-standing claims of zero error rates were "not scientifically plausible". This finding has left fingerprint examiners in a rather awkward position. One of them asks[14]:

> "How do you explain to the court that what you've been saying for 100 years was exaggerated, but you still have something meaningful to say?"

The answer, I would submit, is to do the research and collect the information to ensure that the methodology of fingerprint identification is robust and capable of defending a challenge based on reliability.

The problem currently lies mostly with the ACE-V (analysis, comparison, evaluation and verification) identification procedure the examiners follow. Much of the concern is focussed on the execution of the procedure; this is often sloppy, with the analysis and evaluation stages of the ACE-V procedure often merging when in fact the protocol calls for as detailed description of the print being made prior to an examiner ever seeing an exemplar. It is also said that the protocol does little to safeguard against unconscious biases of the examiners; the verification stage of the protocol calls for it to be independent of the initial analysis, yet it is often the case that a verifier will work in the same department as the first examiner.

It seems to me that the central issue is that fingerprint analysis is fundamentally subjective and therefore inherently capable of misidentifications. The language of certainty that examiners are forced to use hides a great deal of uncertainty, which greatly undermines the examiners' legitimacy. Critics have called for change in this respect: Christophe Champod, Professor of Forensic Identification at the of University of Lausanne, in Switzerland, proposes probabilistic terms to render the decision making process less opaque; alternatively, Simon Cole, a science historian at the University of California in Irvine, has said :

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[13] One such example is that of Oregon lawyer Brandon Mayfield. Mr Mayfield was arrested in 2004 by the US Federal Bureau of Investigation ("FBI") following the terrorist attacks in Madrid. He was subsequently released after Spanish police arrested an Algerian national and found one of his prints to be a much better match. The FBI eventually admitted that it had made multiple errors in its fingerprint analysis.

[14] *The Fine Print*, article by Laura Spinney. Nature, 18 March 2010.

> "If they [fingerprint examiners] want to go in and testify, "I think it's his print and 1 per cent of the time I'm wrong" then that would be more reasonable".

I do not attempt to debate which of these suggestions, if any, should be adopted (although it seems to me that expressing fingerprint identification in probabilistic terms is the better solution), instead I seek to highlight the importance of having a methodology and a hypothesis that are capable of withstanding robust testing. Arguably, as it currently stands, the science of fingerprint identification does not.

In the same context, I ought to add the importance of explaining the justification for evaluative opinions in certain areas. In *R v T* [2010] EWCA Crim 2439 as recently as 26 October this year, the Court of Appeal considered evidence relating to footwear marks, which was presented as an analysis of two propositions namely that a particular shoe made the mark that it has been compared with and that the shoe did not make the mark that it has been compared with. The strength of the assessment of the scientific evidence was normally expressed as a level of support for one of the two propositions on a progressive scale being very limited, limited, moderate, moderately strong, strong, very strong and extremely strong without reference to likelihood ratios which had, in fact, been calculated on a Bayesian approach by the scientist as a check to his experience based opinion. The decision is published in redacted form and criticises both the use of the Bayesian approach and, as lacking in transparency, the omission of the data from the disclosed evidence.

To conclude this section on the problems with the current approach, it is, in my opinion, perfectly clear that expert evidence of doubtful reliability may be admitted too freely with insufficient explanation of the basis for reaching specific conclusions, be challenged too weakly by the opposing advocate and be accepted too readily by the judge or jury at the end of the trial. In that regard, therefore, the law of England and Wales is not satisfactory and reform is undoubtedly required. I now turn to look at the proposals for such reform.

Reform

A recent report by the Law Commission examined the admissibility of expert evidence in criminal proceedings in England and Wales. Whilst its findings are confined to criminal proceedings, they are in my view equally applicable to civil proceedings.

The Law Commission was in no doubt that reform of the law relating to the admissibility of expert evidence is required. In its view, numerous scientists, practitioners

and legal academics have come to the same conclusion, calling for a new basis for screening expert evidence to ensure that only sufficiently reliable evidence will be considered by the jury and, I would add, by the judge. The Law Commission's basic premise was that expert evidence must satisfy a minimum standard of evidentiary reliability to be admissible. Four options for achieving this were then discussed which I will consider in turn:

(1) *Exclusionary discretion without guidance.* In this way, expert evidence would simply be treated like other evidence generally. The Australian Law Reform Commission has favoured an approach falling within the scope of this option. Indeed, the Uniform Evidence Acts, which came into force in the Commonwealth and New South Wales in 1995[15] and more recently in Victoria in 2008[16], set out a general discretion to exclude evidence on the ground that its probative value is substantially outweighed by the danger that the evidence might be unfairly prejudicial to a party. The Law Commission rejected this option on the basis of its view that the trial judge should be properly equipped to address expert evidence with reference to appropriate reliability guidelines.

(2) *Exclusionary discretion with guidance.* This second option goes some way to curing what were perceived to be the deficiencies of the first. Specific guidance would be read alongside the general exclusionary discretion, and it is this discretion which would be applied to exclude the proffered evidence. However, there would be no separate admissibility test for expert evidence and this is deemed necessary by the Law Commission since the determination of the reliability of expert evidence transcends the facts of the case. As a result, this option was rejected.

(3) *An admissibility rule requiring consensus amongst experts in the field.* Such a rule would be based on the *Frye v United States* test I mentioned earlier. Essentially, this involves the trial judge deferring to the view of the relevant expert community when determining whether expert evidence should be admitted. However, the Law Commission again rejected this option. It believes that the responsibility for questions of admissibility should lie with the judiciary rather than non-judicial actors and I am inclined to agree. It seems that so does the Australian Law Reform Commission, who recently concluded that the *Bonython* test "points to acceptance by the court rather than by a professional

[15] The Evidence Acts 1995 (Cwlth and NSW)
[16] The Evidence Act 2008 (Vic)

community", contrary to the demands of *Frye*. I would also warn that the *Frye* approach can act as a barrier to the admissibility of novel but inherently sound areas of scientific expertise – that is to say, those that are based on demonstrably valid methodology – merely because enough time has not passed for there to be general acceptance within the scientific community.

(4) An admissibility rule requiring the trial judge to assess the evidentiary reliability of the tendered evidence. The Law Commission described this option as a "*Daubert*-type test", referring to the United States Supreme Court decision in *Daubert v Merrell Dow Pharmaceuticals* 509 US 579 (1993) where it was held that the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant but reliable. *Daubert* asserts that science achieves reliability by generating hypotheses and testing them to see if they can be falsified. The Law Commission have developed the *Daubert* test into a provisional proposal for reform of the law relating to the admissibility of expert evidence in criminal proceedings in England and Wales.

In adopting this fourth option, the Law Commission aims to bring a degree of clarity and certainty to the law and legal processes governing the admissibility of expert evidence. Its proposal consists of the introduction of a new statutory test for determining the question of admissibility, supported by guidelines relating to both scientific-based, and experience-based expert evidence. The test would require the judge to take on a gate-keeping role. He or she must be satisfied that the evidence is sufficiently reliable to be admitted – namely, that it is based on sound principles, technologies, methods and assumptions, that these have been properly applied to the case, and that the conclusions reached are logically sustainable. How the proposal has fared, we await to hear but it is to be hoped that the implementation of such a proposal will minimise the risk of a miscarriage of justice in cases where a party seeks to rely on expert evidence.

Complementary measures

I question whether refining the test relating to the admissibility and reliability of expert evidence alone is capable of constructing a system of review that will reduce the number of cases where the value or probity of the expert evidence is later challenged. Will this, for example, alleviate the concern that juries have a tendency to be improperly influenced by expert evidence? I am not alone in my concern, for the Law Commission also recognised the importance of underpinning any new statutory test for the admissibility of

expert evidence by complementary measures. Such measures would include: first, a more robust approach to the accreditation and regulation of expert witnesses; second, a disclosure process which would allow all parties to screen their opponent's expert witnesses in advance of the trial to assess, amongst other things, their qualifications, experience and accreditation; and finally, an enhanced training curriculum for new judges and junior lawyers which would require them to have an understanding of the factors to be borne in mind when assessing the viability of a scientific hypothesis, and equip them to intervene if an expert witness presents his or her evidence in an inappropriate way or strays from his or her legitimate field of expertise.

It is perfectly clear that we need to work on developing bodies of knowledge which are both organised and accepted. Moreover such bodies and their experts should be equipped with guidelines on the robustness of their evidence – in other words, what they will need to show in order to satisfy the Court that their evidence is reliable and should be admitted.

An increase in accreditation is also hugely desirable. In the United Kingdom there has traditionally been no system of accreditation or regulation of forensic scientists. The dangers of this lacuna are obvious; theoretically anyone with any sort of scientific background and sufficient personal confidence, perhaps less politely described as brass neck, or who was sufficiently misguided, could set themselves up as a forensic science expert and produce evidence that, at best, is unhelpful and, at worst, positively misleading; nobody would necessarily be the wiser. In 1997, with the support of the Home Office, the Council for the Registration of Forensic Practitioners ("CRFP") was established as an independent regulatory body to promote public confidence in forensic practice in the United Kingdom.

The CRFP unfortunately ceased trading owing to a lack of government funding. Nevertheless its accreditation system is worthy of mention: accreditation was based on peer review of forensic practitioners. Practitioners had to obtain separate accreditation for each field of expertise in which they wished to practise. They had to specify precisely what they were accredited in, renew their accreditation every four years, and abide by a strict code of practice. If they failed to meet the necessary standards, a practitioner could face expulsion from the register. In my view, be it the CRFP or some other body, this is precisely the sort of regulation and accreditation which we are currently lacking. It ought to be established and similar bodies created for all experts albeit that some other system might be required for particularly esoteric and not often used expertise. A failure to take this type of step risks not just miscarriages of justice, but the very reputation of the professions themselves.

On a more general note, the judgment of Moses LJ in *Henderson, Butler, Oyediran*, whilst written in the context of shaken baby syndrome and medical expert evidence, contains importance guidance on the management of expert evidence generally by the Courts. He said:

> "205. Proper and robust pre-trial management is essential. Without it, real medical issues cannot be identified. Absent such identification, a judge is unlikely to be able to prevent experts wandering into unnecessary complicated and confusing detail. Unless the real medical issues are identified in advance avoidable detail will not be avoided.
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> 206. The process of narrowing the real medical issues is also vital in relation to another important function of the judge in advance of the trial. He should be in a position to identify whether the expert evidence which either side wishes to adduce is admissible."

Thus effective control over, and management of, expert evidence by the judge is of paramount importance in the context of any scheme relating to admissibility and identification of issues. In that regard, pre-trial meetings between experts to narrow the issues and identify what is agreed and what is truly contentious should now be commonplace both in civil and criminal litigation.

The idea of meetings is not new and it is appropriate to end this talk by going back in time to 1882 and Sir James Fitzjames Stephen[17]:

> "There have been, no doubt, and there still occasionally are, scenes between medical witnesses and the counsel who cross-examine them which are not creditable, but the reason is that medical witnesses in such cases are not really witnesses but counsel in disguise, who have come to support the side by which they are called. The practice is, happily, rarer than it used to be; but when it occurs it can be met and exposed only by the most searching, and no doubt unpleasant, questioning. By proper means it may be wholly avoided. If medical men laid down for themselves a positive rule that they would not give evidence unless before doing so they met in consultation the medical men to be called on the other side and exchanged their views fully, so that the medical witnesses on the one side might know what was to be said by the medical witnesses on the other, they would be able to give a full and impartial account of the case which would not provoke cross-examination. ... Such a practice of course implies a high standard of honour and professional knowledge on the part of the witnesses employed to give evidence, but this is a matter for medical men. If they steadily refuse to act as counsel, and insist on knowing what is to be said on both sides before they testify, they need not fear cross-examination."

[17] History of the Criminal Law of England, Chapter 15 page 575

Who said that there was anything new in the law?

Thank you very much for your kind attention[18].

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[18] I must pay tribute to the assistance I have received in researching this paper from Laura Carlisle, a lawyer who was then working as a judicial assistant in the Court of Appeal. In a form which has since been modified, it was originally presented at the Annual Conference of the Supreme Court of New South Wales in August this year.