



1 Introduction and background

The Law Commission have presented proposals for the measurement of the reliability of scientific evidence as a prelude to considering its admissibility in Court, “The Admissibility of Expert Evidence in Criminal Proceedings in England and Wales; A New Approach to the Determination of Evidentiary Reliability. This response is made on behalf of The Forensic Institute, and as such, sets out some background material as to the role of the defence expert, and discusses how the proposals are likely to relate to the policy and practise of providing a defence perspective in forensic science. Much of the background material was provided to the Forensic Regulator in response to his consultation document on the accreditation of experts.

1.1 *The Forensic Institute*

The Forensic Institute is a private firm which, in addition to its own four staff based in offices in Glasgow, has an international network of experts and organisations that provide a comprehensive scientific and medical service to the legal profession in all of the jurisdictions of the UK and have performed work in other countries including Australia, USA, Egypt, and New Zealand. The Institute provides scientific and medical advice and training relevant to civil or criminal justice matters. The Institute is not based in a laboratory but can, and does, contract analytical services if necessary.

The Institute is normally instructed by the defence to assess the merit of the scientific evidence in criminal prosecutions. It is commonly accepted that all experts should be independent and impartial participants in the legal process, whether they are retained by the prosecution or the defence. This view is strongly endorsed by The Institute.

Our service model is perhaps fundamentally different to the traditional approach, in which a single defence expert deals with a single aspect of a case. The Institute specialises in assessing multi-disciplinary and, frequently, complex cases involving multiple evidence types. For example, Professor Jamieson, the director of The Institute, co-ordinated the scientific evidence for the defence in the Omagh Bomb Trial (*R v Sean Hoey*), as well as giving several days of evidence in that trial, and is currently involved in three conjoined Appeal Court cases (*Reed & Reed, Garmson, and Wong*) which is likely to set precedent for the use of aspects of Low Template DNA evidence. We have, therefore, extensive experience of reviewing and challenging in extensive detail the work of forensic practitioners and forensic science in a variety of disciplines, and also seeing our expertise and experience challenged in court.

Professor Jamieson also has extensive experience in the development of standards in forensic science, having served on the Lead Body and Sector Skills Committee for Forensic Science, which developed the first suite of National



Occupational Standards for Forensic Science. He also chaired the Standards Committee of the Forensic Science Society, served on the SEMTA committee investigating the link between education and employment in Forensic Science¹ and, as Head of Forensic Science for Lothian & Borders Police, was a member of the Consultative Forum which created the Council for the Registration of Forensic Practitioners (CRFP). He is one of two Editors in Chief of a 5-volume Encyclopaedia of Forensic Sciences published by Wileys.

2 Purpose of the Defence Review

The Forensic Institute maintains that the main purpose of a competent scientific defence expert is, rather than to simply repeat the Crown tests, to review the processes, procedures, and conclusions of the prosecution experts. This includes verification that what has been claimed to have been done *has* been done, and whether it has been done according to appropriate procedures and standards. In that regard we regard our first and main role as being that attributed to the independent assessor discussed in paragraphs 6.65 to 6.71 of the Consultation. In that regard, it is difficult to reconcile our perceived role as defence experts as different from the Independent Assessor who, “*because his or her function would be quite different from that of the expert witnesses called by the parties*”. For example, we provided extensive briefing papers to the defence in several ‘shaken baby’ cases (including *R v Holdsworth*) which examined the scientific support for the proffered opinions on both sides without offering opinion as to the conclusions by the same experts.

The main components of a thorough and competent defence review are verification and discovery.

2.1 Verification

2.1.1 Procedures

Procedures are frequently developed for critical parts of the evidence and analysis chain. In some instances there will be internal procedures in addition to national or international references (e.g. several publications on the use and interpretation of LCN, and also internal procedures). Review entails checking that these procedures are appropriate, and that they have been utilised.

To verify the procedures, the reviewer will check Standard Operating Procedures, Quality Manuals and other procedure documentation, contemporary notes, standards documents, supporting scientific or other literature, and witness statements.

¹ **Forensic Science: Implications for Higher Education 2004**

http://www.heacademy.ac.uk/assets/ps/documents/forensic_science_implications_for_higher_education_2004.pdf



2.1.2 Interpretation

When items are tested and results are obtained, those results are interpreted. Therefore, a defence verification of the interpretation involves checking that the correct testing has been performed in the correct way, and that the results properly reflect the sample. Checking will include viewing any printed output obtained from the testing, viewing contemporary notes, and may include verification of the calibration of the equipment, reference standards, positive and negative controls, and the maintenance and calibration log of the equipment.

2.1.3 Evaluation

When results have been obtained and noted (i.e. interpreted), evaluation then occurs. Evaluation is the consideration of the analytical results in the specific context of the case in hand. Evaluation will almost invariably involve the consideration of other possible scenarios that encompass the evidence. In that regard, it is usually necessary for the defence to revisit the contemporary notes of the prosecution experts to inform either the creation of new scenarios, or to test current ones.

2.2 Discovery

The second function of the defence review, after verification, is to discover any information that is not apparent from the statements or notes produced by the prosecution.

These may include, but not limited to;

- Items seized but not examined
- Items not tested
- Items not reported
- Validation and accreditation of methods
- Training and competence of analysts
- Contamination opportunities

This last aspect is increasingly important as the sensitivity and specificity of tests, such as LCN DNA, increases. Only close examination and comparison of continuity and case notes can establish the exact whereabouts of individual items at any pertinent time.

2.3 Assessment by the Defence

2.3.1 Individual

Individual experts, with expertise in particular areas, will contribute to either the overall consideration of the case, or to specific reports on their area of expertise.



2.3.2 Collective

Most cases involve discussion and input from other scientists, usually on the particular science applied to testing, and on the interpretation within the opinion. The Institute staff collectively discuss and peer review cases, case briefings and statements, and also reports received from other consultants, prior to sending these to the instructing lawyer. This is a form of quality assurance and may involve experts across the world. There is no business, scientific, or legal reason to have this collective review only as part of an accreditation process.

2.3.3 Reports and briefings

The main output of all of the above is a collection of data, briefing papers, and reports that enable the assessment of the work performed to derive the opinion expressed in prosecution reports and, where appropriate, to form the basis for other expert reports which may challenge those opinions.

The final output is in the form of briefing papers and reports to instructing lawyers or Counsel. In some cases the briefings or reports may concur with the methods, interpretations and evaluations employed by the prosecution experts, in other cases there are differences between the prosecution and defence conclusions. When required, experts from The Forensic Institute give evidence in court.

3 Specific responses

6.78 Do consultees agree with our provisional proposal that there should be a statutory test for the admissibility of expert evidence in criminal proceedings, as set out in paragraph 6.10 above?

Yes.

6.79 Do consultees agree with our provisional proposal that trial judges should be provided with guidelines for determining the evidentiary reliability of scientific (or purportedly scientific) expert evidence, as set out in paragraph 6.26 above?

Although the guidelines are superficially attractive, they are likely to lead to some controversy regarding terms such as, “properly tested, ... the margin of error ... a body of specialised literature relating to the field”, are poorly defined and will require better specification for individual fields. In particular, our experience in *R v Hoey* and other cases has illustrated that although there is wide agreement as to the purpose of scientific validation (i.e. determining the reliability of results) there is little agreement as to how that reliability is to be measured.

All scientific analyses are estimates of the accurate result. Tests vary in their ability to provide the accurate result. Illustratively, if a person keeps throwing balls at a target the resultant pile of balls will represent the spread of the person’s



aim. A good thrower will have a pile restricted to a smaller area than a poor thrower. If we allow both persons to throw a ball and then remove target and then get an independent observer to estimate the chance that either ball is close to where the target was they will wish to know the accuracy of the thrower. The unanswered question is whether the Court will accept different margins of error and whether there will be an absolute limit of error beyond which the evidence will be inadmissible. This will inevitably lead to debate as to how to measure the error in each discipline or technique.

The concept of a 'body of specialised literature' is similarly fraught with a lack of definition. Most hobbies have a 'body of specialised literature' but this would hardly enable them, or their practitioners, to provide reliable scientific evidence. 'Fingerprint Whorld' would represent specialised literature that we would consider would not meet the normal requirements of a scientific publication; in particular, the opportunity for external scientific review. It is important that science is seen, as described by the astronomer Carl Sagan, as 'more than a body of knowledge; it is a way of thinking.'² In that regard, it is vital that the "relevant scientific community' is not too narrowly defined.

This is not to argue against discussion and a move toward such measures.

6.80 Do consultees agree with our provisional proposed guidelines for experience-based (non-scientific) expert evidence, as set out in paragraph 6.35 above?

This separation is difficult to maintain given the propensity of experts primarily grounded in scientific disciplines (e.g. DNA) to recite 'casework experience' (i.e. non-empirical and experimentation-based) as support for their opinion. The separation between scientific (i.e. experiment-based and assessed) evidence and experiential evidence will require to be explicitly identified in court to enable the jury to understand the material difference between them. This is a responsibility that should be placed upon the expert and Counsel jointly.

6.81 Do consultees agree with our provisional proposal in paragraph 6.57 above that, where necessary, the party proposing to adduce expert evidence, whether the prosecution or a defendant, should have to demonstrate that it is sufficiently reliable to be placed before the jury?

There is an important scientific distinction between affirmation and rebuttal of a scientific theory. It is vital that the onus is on the proposer of a method or principle to demonstrate the reliability of same. In that sense we wholly agree with the Popper's concept that a theory can only be considered scientific if it is, in principle, falsifiable.

² Carl Sagan, *The Demon-Haunted World*, 1997.



6.82 *Do consultees agree with our view that the other aspects of the present common law test governing the admissibility of expert evidence in criminal proceedings are satisfactory? (Paragraph 1.2(1) and (3) and paragraph 1.3 above.) If so, do consultees believe that these rules should be codified in primary legislation?*

Whilst accepting that there are many difficulties with the current system, and advantages in the proposals, as scientists we are not in a position to judge the merits of legislative developments in this regard.

6.83 *We would also welcome consultees' views on:*

(1) whether the trial judge should, in exceptional cases, be entitled to call upon an independent assessor to help him or her apply our proposed test for determining the reliability of expert evidence (paragraph 6.67 above);

On balance, yes, although we have regarded this as our principal role. As an alternative, we would propose that the Court (Judge) should be able to ask a series of essentially factual questions to be answered by a joint statement from the experts on both sides. At the least this would also identify areas of disagreement between the experts. If such a disagreement on these factual issues exists it is unclear how a 'third' expert would be in a better position to decide the issue than the Court.

(2) whether the question of evidentiary reliability should always be decided before the jury is sworn, with the possibility of an interlocutory appeal to the Court of Appeal (paragraph 6.3 above; and see Appendix B).

Yes, subject to the proviso that the Judge must demonstrably understand the issues and be required to provide a written judgement with the reasons for the judgement so as to enable an Appeal on the basis of such a clear misunderstanding that an error is probable.

4 Other comments arising from the Consultation Document

"1.15 We believe that the following measures would complement the proposals we are making and that our proposals, in tandem with such measures, would solve many of the problems associated with expert evidence in criminal proceedings:

(1) a more robust approach to the accreditation and regulation of expert witnesses, whether called by the prosecution or the defence"

Accreditation is primarily a means by which methods and procedures are set to paper, and a system put in place to ensure that those methods are followed. The



service specification for International Standards Organisation (ISO) accreditation is primarily set by 'customer requirements', not by scientific accuracy or reliability.

Our role is to verify that the internal procedures have been performed by Crown scientists, and that those procedures, where applicable, conform to nationally and internationally acceptable science. Although training and validation is examined as a small part of the accreditation process, there are no set standards, for accuracy or reliability of analyses for example, imposed upon the organisation. In the existing schemes, the standards are described as 'fit for purpose', and that purpose decided by the customer.

In our view, it is unnecessary that such accreditation is applied to those tasked with reviewing results, in contrast to analysing materials and creating the results in the first instance. This would apply to many academic experts who, whilst undoubtedly expert, would not ever be part of any accreditation process.

There is diminished scope for the wider scientific scrutiny of forensic science as distinct from some other forensic disciplines. This is of especial concern when it is being increasingly recognised that,

"... there is wide variability across forensic science disciplines with regard to techniques, methodologies, reliability, types and numbers of potential errors, research, general acceptability, and published material. Some of the forensic science disciplines are laboratory based (e.g., nuclear and mitochondrial DNA analysis, toxicology and drug analysis); others are based on expert interpretation of observed patterns (e.g., fingerprints, writing samples, toolmarks, bite marks, and specimens such as hair). The "forensic science community," in turn, consists of a host of practitioners, including scientists (some with advanced degrees) in the fields of chemistry, biochemistry, biology, and medicine; laboratory technicians; crime scene investigators; and law enforcement officers. There are very important differences, however, between forensic laboratory work and crime scene investigations. There are also sharp distinctions between forensic practitioners who have been trained in chemistry, biochemistry, biology, and medicine (and who bring these disciplines to bear in their work) and technicians who lend support to forensic science enterprises."³

The same extensive and authoritative report states,

"disparities between and within the forensic science disciplines highlight a major problem in the forensic science community: The simple reality is that the interpretation of forensic evidence is not always based on scientific studies to determine its validity. This is a serious problem. Although research has been

³ Strengthening Forensic Science in the United States: A Path Forward. Committee on Identifying the Needs of the Forensic Sciences Community; Committee on Applied and Theoretical Statistics, National Research Council, National Academy of Sciences of the US. Published February 2009



done in some disciplines, there is a notable dearth of peer-reviewed, published studies establishing the scientific bases and validity of many forensic methods.”

It is therefore unlikely that an amalgam of ‘practitioners’ to decide on accreditation standards would have any more authority in some disciplines than a collection of astrologers or tea-leaf readers collectively deciding standards for themselves.

Much, if not most, of the practice of *forensic* science is the practice of science, including the interpretation and evaluation of evidence with an occasional overlaying of legal considerations such as continuity. “Forensic science” is not some self-contained discipline like medicine, mycology, civil engineering, or computing.

(2) a disclosure process which would allow all parties to screen their opponents’ expert witnesses in advance of the trial to assess, for example, their qualifications, relevant experience, extraneous conduct and whether or not they are accredited by a reputable body

There can be no doubt that these are permissible activities, however the extent and the nature of those enquiries should be set out. In one of our cases the Police sent two officers from Southern England to Edinburgh to ‘investigate’ the qualifications and experience of an expert when this could as effectively be performed by letter. The effect of the ‘investigation’ was detrimental to the professional reputation of the expert despite no material defects being discovered in the exercise.

(3) an enhanced training curriculum for new judges and junior lawyers

Yes. Professor Jamieson has already been quoted on this topic;

“According to Jamieson, who has lectured worldwide on forensic issues, solicitors at the Crown Prosecution Service in England and Wales, the equivalent of the DPP, are being trained in the areas of scientific and medical evidence that most commonly crop up in criminal law cases.

As part of his work at the forensic laboratory in Edinburgh, Jamieson “unravelled the science” behind the opinions of pathologists, and was often called to court to impart his knowledge. “In my experience, the questions of lawyers and barristers are just not penetrating enough,” he said.



“This is understandable in that they don’t have a great knowledge of the subject. Yet they are the one group of people who get to cross-examine pathologists and forensic experts, and ask them how they arrived at their conclusions.”⁴

“1.20 ... We propose that “orthodoxy” which cannot be shown to be trustworthy should not be admissible.”

We wholeheartedly support this view. As the Commission quote,

“Most of forensic science operates outside of the peer review systems, and forensic science is seldom published. While forensic science techniques are accepted in forensic science, many are not accepted by a broader scientific community. Furthermore, the techniques accepted in forensic science are not used in such a way that would reveal their methodological flaws, if any.”

This view has been given powerful and relevant force by the recent National Academy of Sciences report on the forensic ‘sciences’. It is likely that there will be a number of serious challenges to the reliability of much of the orthodoxy, such as mark and impression evidence.

It is vital that the Commission recognise that these challenges are unlikely to emanate from within the ‘relevant scientific community’ (i.e. the practitioners), but from the wider scientific community. The essential point is that when the fundamental scientific approach to a discipline is being challenged it is only necessary that the challenger has a knowledge of science, although knowledge of the specific discipline is advantageous.

This recognition impinges upon the difficulty recognised at,

“2.7 The problem is particularly worrying if there is no available expert in the same field who can be called by the opposing party to provide an effective criticism of the expert evidence in question, particularly if the forensic tool of cross-examination (by a non-specialist advocate) would provide only an ineffectual substitute.”

The legal profession should be aware of the opportunity to assess and challenge the underpinning science of any discipline and abandon the current, prevalent ‘fire-with-fire’ approach.

⁴ <http://archives.tcm.ie/businesspost/2006/04/30/story13838.asp>



“Having considered the principal approach adopted in the United States (the Daubert test),³⁸ and heard evidence from academics and the Association of Chief Police Officers, the Committee concluded that the “absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory” and found the idea of “an objective, clearly defined test to establish whether a theory or technique is sufficiently robust and evidence-based to merit admission in court” to be “highly attractive”.”

Whilst the idea is highly attractive, as described above, it is unlikely that any objective, clearly-defined test exists that would apply to all of the expertise under consideration. The Commission should consider the validation methods for those processes that are amenable to such, but also carefully consider whether it is the analytical method (i.e. the result) that is being validated or the evaluation of the result (i.e. its significance in the particular case. This distinction is vital to avoid solid and sound science being used as a cloak for unsound inferences. The issues surrounding transfer of small amounts of DNA would be an example of such.