As a sustained observer of expert evidence and criminal procedure in the United Kingdom (and elsewhere), I would like to draw attention to a range of issues pertaining to forensic science evidence. These issues, outlined below, address several of the questions posed by the Select Committee on Science and Technology.

By way of introduction, I am a professor in the School of Law at the University of New South Wales in Sydney, Australia (with a fractional appointment at Northumbria Law School in Newcastle upon Tyne). I am actively involved in empirical legal studies, have written extensively on expert evidence in Australia, England and Wales, the United States and Canada, was an international adviser to the Goudge Inquiry into Pediatric Forensic Podiatry in Toronto, and Chair a multi-disciplinary collective of research scientists, lawyers, forensic scientists and forensic pathologists who work together on problems at the intersection of law, science and medicine.

I have included a number of references, many written as part of multi-disciplinary collaborations (with colleagues in law, the forensic sciences and the sciences), that elaborate upon the issues advanced below. Some of the following points challenge conventional legal assumptions and approaches to expert evidence in criminal proceedings. All of the materials referenced below are available on request, though many are readily available through on-line repositories.

1. Validity, scientific reliability and admissibility
Insufficient attention has been directed to the validity and scientific reliability of forensic science evidence by lawyers and judges, and some sectors of the forensic sciences. Courts do not require those presented as experts to demonstrate that their procedures are valid and that they possess actual expertise as part of routine admissibility decision-making. (Here, DNA profiling may be something of an exception). Traditional legal interest in ‘reliability’ or ‘sufficient reliability’ has generally been perfunctory. In consequence, issues of probative value and weight have been left to the trial and the tribunal of fact to determine in individual cases, often without the insights provided by scientific research. Parties, and especially defendants, are not usually adequately resourced or sufficiently technically proficient to recognise or credibly explore the limitations of many types of forensic science evidence. Important issues around validity and limitations are not consistently raised or effectively conveyed to decision-makers. It is in this environment that laypersons – whether lawyers, judges or jurors – are required to evaluate opinions presented as expert.

There is a need for admissibility standards for forensic science evidence (especially forensic comparison procedures) that are directly focused on the validity of procedures and provide information about accuracy and error. When the admissibility or value of forensic science evidence is contested (or a judge has concerns), courts should focus on the following questions: Can the person presented as an expert (regardless of their qualifications or past experience) actually do the specific task? How well? And, how do we know? For scientific,
technical and medical evidence there should, in general, be independent (published) support for the validity of procedures as well as evidence of individual proficiency doing the precise task.


2. Courts should (presumptively) adopt criteria recommended by scientists

Courts do not use the kinds of criteria used and recommended by mainstream scientists (and peak scientific organisations) when determining the admissibility and probative value (or weight) of forensic science evidence. Courts should focus on validation and demonstrable ability and other appropriate indicia of expertise. In general, courts should only depart from mainstream scientific advice where there are compelling reasons of legal principle or fairness; and these should be identified and explained. Here, long tradition, collective judicial experience, and confidence in trial safeguards do not provide a credible basis for exempting forensic science evidence from formal scientific evaluation.

The fact that judges do not routinely use scientifically-informed criteria for admission and evaluation suggests that they are not particularly conversant with scientific and technical forms of evidence, the importance of validation and other forms of evaluation, or the need for proponents of forensic science evidence to pro-actively identify and disclose limitations (such as accuracy, error and risks from human factors).


Edmond, G. (2016). Legal and non-legal approaches to forensic science
3. Formal mechanisms to provide judges with mainstream scientific advice

Criminal courts, and especially appellate courts, are not regularly presented with mainstream scientific research on forensic science procedures, or advice about the kinds of information and evaluation that attentive scientists recommend. Courts need a formal or institution mechanism that provides access to independent (multi-disciplinary) scientific advice or enables them to obtain such advice. Our conventional adversarial practices, with the heavily reliance on the parties, have not provided trial and appellate judges with systematic insight into mainstream scientific perspectives that might be used to facilitate informed decision-making and policy development. And, where defendants have sought to raise mainstream scientific studies and advice, trial and appellate courts have shown a tendency to prefer the opinions of individual forensic practitioners to general studies (of a procedure) or mainstream scientific recommendations and advice. (Compare, for example, the decision in Otway v R [2011] EWCA Crim 3, with the primer on gait analysis produced by the Royal Societies of London and Edinburgh, reviews by Edmond and Cunliffe (2016) and Cunliffe and Edmond (2014), cited below, and the general advice of the Forensic Science Regulator).


4. All reports should comply with procedural rules and practice directions

Many of the expert reports produced by or for the state do not comply with the recently revised CrimPD and CrimPR. This means that lawyers and judges (and others) are not in a position to understand the forensic science evidence. Streamlined forensic reporting (SFR) in particular, threatens both the rationality and fairness of proceedings, under the pre-text of efficiency, by not providing those accused of criminal acts with the detail and limitations of the forensic
science evidence raised against them. Defendants and their lawyers are expected to make sense of the expert evidence, and to make forensic decisions, in the absence of information about how the evidence was produced, who generated the evidence, and its limitations.


5. Expert reports and testimony should facilitate rational decision-making

Forensic scientists must place decision-makers in a position to be able to rationally evaluate their opinion evidence. In many cases this will require independent evidence of procedures being validated and valid, along with the forensic practitioner being proficient with the validated procedure. Forensic science results must be presented in ways that embody the known strength (and limitations) of the evidence – e.g. probabilistic forms or with indicative error rates. Where procedures have not been formally evaluated derivative opinions should be appropriately qualified (i.e. epistemologically modest) or not admitted at trial. Decision-makers, whether judges or juries, should be presented with the results of formal evaluation rather than be obliged to rely upon potentially misleading proxies such as witness credibility, demeanour, experience, confidence, previous legal use, popular impressions of the procedure, and so forth. For, these are not reliable indicators of expertise and accuracy.

A rational system of justice should not leave decision-makers to speculate about the value of forensic science evidence. It should not encourage reliance on misleading proxies. Trial safeguards, such as cross-examination and judicial instructions and cautions, cannot replace the need to formally evaluate procedures. In the absence of formal evaluation, judges are not in a position to explain forensic science evidence or warn juries of the risks associated with it.


6. Digital and electronic evidence

Courts should not encourage the admission of new procedures and derivative interpretations until those procedures have been formally evaluated. (Courts should not be early adopters of new forensic science technologies, because they are basically incapable of assessing the value of the evidence through quotidian trial processes; including trial safeguards). Decision-makers are not able to assess the value of the impressions and opinions of those presented as experts until procedures and abilities have been formally evaluated. Trial safeguards cannot compensate for the failure to formally evaluate, and they cannot place decision-makers in a position to rationally attribute probative value (or weight)
to the evidence.

Some types of interpretive tasks, such as the identification of persons from images (e.g. CCTV) using face, clothing and/or gait, and identification of persons via voice recordings, are often admitted and relied upon in criminal proceedings even though these are difficult and error prone tasks. Complicating matters, opinions are routinely obtained in highly suggestive conditions, where the ‘expert’ – frequently an investigator – is aware of the identity of the person of interest. (Forensic scientists have not been attentive to the risks posed by human factors and cognitive bias, historically). Witnesses should not be able to testify about identity from electronic and digital evidence unless the underlying procedure has been shown to work in similar (though not necessarily identical) conditions. (In addition, there are real risks in suggestively exposing the tribunal of fact to images and/or voice recordings during the course of proceedings.)

On problems with image (faces and gait), ‘super-recogniser’ and voice evidence, consider:


7. Procedural innovation is less important than formal evaluation, gatekeeping and education

Use of procedures, such as concurrent evidence and court-appointed experts, might confer advantages (and perhaps some efficiencies) but they should not be used to avoid attending to the fundamental issues of validity, scientific reliability and proficiency.

Substantial resources should be dedicated to training lawyers, judges and forensic scientists. Evidentiary complexity is an issue that is not going away anytime soon.


10 September 2018