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# Scots Law of Evidence

## Fit for purpose in the digital and global age?

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**Scottish Universities Insight Institute**
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# Scots Law of Evidence:

# Fit for purpose in the digital and global age?

This programme was funded by the Scottish Universities Insight Institute, and ran from April to September 2011. The programme team members were:

- Prof. Colin Aitken, Professor of Forensic Statistics, Edinburgh University
- Prof. Sue Black, Professor of Anatomy and Forensic Anthropology, Dundee University
- Prof. Pamela Ferguson, Professor of Scots Law, Dundee University
- Prof. Fiona Raitt, Professor of Evidence and Social Justice, Dundee University
- Mr Andrew Rennison, UK Forensic Science Regulator

**Note:**

The Scottish Universities Insight Institute (SUII) hosts programmes of enquiry which address and inform substantial issues that face Scotland and the wider world. SUII is a development from the Institute for Advanced Studies funded by the University of Strathclyde as a pilot from January 2009. During the period of this project in 2011, it was a formal partnership of five Scottish universities: Dundee, Edinburgh, St Andrews, Stirling and Strathclyde. The Institute is housed in purpose designed premises at the University of Strathclyde in Glasgow. Its objective is to encourage and facilitate interaction between members of wider communities - in the public sector, business and the third sector – to come together and bring fresh insights into issues that have an impact upon life within Scotland and to better inform policy and decision makers.

# Contents

# 1. Programme purpose and approach

## a. Background and current context

The relationship between law and science is increasingly important to society. The law of evidence governs what kind of science can be introduced into court. Innovations in scientific processes and other forensic techniques offer increased opportunities to bring offenders to justice, but also raise human rights concerns over fairness to the accused in obtaining the evidence, as well as the scientific reliability of that evidence and the rigour of its validation. The main objective of this programme was to examine the rules of admissibility of scientific evidence in court, and their fitness for purpose in the digital and global age. By bringing together a range of expert practitioners from law, forensic science, psychology, the police, judiciary and academia, as well as policy-makers, regulators and those with commercial interests, we stimulated debate and were able to explore in detail the most pressing issues that need to be addressed if Scotland is to be confident about its regime for the use and management of expert scientific evidence in the courtroom, especially in criminal trials.

It is also important to acknowledge the extent to which scientific evidence features daily in the criminal justice system but is unnoticed. It is easy to forget that a focus on admissibility of evidence in the courtroom, and the lessons from historical miscarriages of justice, tend to centre attention on cases that have been contested in court. However, the great majority of guilty pleas arise after scientific evidence is produced by the prosecutor to the defence. For reasons rarely touched upon in the programme, many suspects or accused persons accept this evidence, doubtless because they are guilty and not because the science is incontrovertible. Despite current rules for disclosure of evidence, the implications of a general lack of resources on the part of the defence to contest reliability must not be overlooked.

This is a particularly apt time to be considering the law of evidence in Scotland. The use of forensic evidence in criminal prosecutions is extensive and scientific developments are continually stretching the parameters of what it is possible to prove and with what degree of reliability. Recent successes in solving "cold crimes" due to the availability of new scientific techniques illustrate the value and importance of novel scientific evidence. However, it is also incumbent upon scientists, and lawyers who use scientific evidence, to ensure the quality of emerging science is appropriately validated in order that courts only entertain reliable evidence. Society too, needs to have confidence that there is no increased risk of a miscarriage of justice due to over-reliance upon insufficiently tested scientific theories or techniques. It is over thirty years since there has been a systematic appraisal of evidence law in Scotland and there has never been a detailed analysis of the use of expert scientific evidence or forensic practices.

A series of events in Scotland since late 2010 gives this programme heightened relevance. The first of those was the ruling of the UK Supreme Court in *Cadder* v *HM Advocate*.[1] In the judgment of the court, Scotland's practices in interviewing suspects in the police station did not meet the European Convention on Human Rights requirements for a fair trial. The decision dramatically altered the landscape within which the investigation and prosecution of crime now occurs. Following the ruling the Scottish Parliament had to pass emergency legislation to ensure Scotland's procedures were Convention compliant but hundreds of prosecutions, including serious assault and rape cases, had to be abandoned in the process. In addition, the

[1] *Cadder* v *HM Advocate* [2010] UKSC 43.

Scottish Government appointed a senior judge, Lord Carloway, to conduct a wide-ranging review and to make recommendations that "properly and fully meet the requirement to protect the rights of victims and suspects."[2] The Report of the Carloway Review was published in November 2011 and made extensive recommendations for changes to procedure and evidence.[3] Some of these, such as the abolition of the corroboration rule, and the right to access to a lawyer during interviews at the police station, impact directly on one of the concerns animating this programme, namely the human rights implications of the extent to which self-incriminating images of photographs of intimate parts of the anatomy might ultimately identify perpetrators of sexual abuse. The final event that makes the programme so timely is the forthcoming report from the Scottish Fingerprint Inquiry[4] into the use of fingerprint evidence, sparked by the Shirley McKie case. This will inevitably generate public debate into the wider issues concerning scientific evidence. Most other English speaking countries have reviewed their practice in this area, most recently in England and Wales where the Law Commission published a series of reports and draft legislation in March 2011; as well as in the US with the National Academy of Sciences Report in 2009.

## b. Programme aims and objectives

The programme aimed to evaluate the risks arising when evidence from science or technology is used in Scottish criminal trials. When such evidence is introduced it is currently unclear what rules govern its admissibility in court and whether these are always compatible with a fair trial for the accused. With the aid of international experts, the programme therefore set out to establish first, the processes courts adopt in determining what constitutes science, its scientific reliability and validity, and its probative value. Having established that backdrop, the programme then sought to review the current status of expert evidence in Scots law in the light of developments, especially in the USA and in England & Wales and identify appropriate scientific protocols to regulate admissibility of scientific evidence and, where relevant, make recommendations for law reform.

## c. Format and structure

The programme consisted of one two day workshop and one three day workshop which addressed the major legal and scientific issues. A concluding one day workshop focussed on the next steps for the project. The format of the first two workshops was a series of PowerPoint presentations addressing one or more research questions and building progressively on the work and discussion arising out of previous sessions. Across the five days of the first two workshops of the programme, 19 presentations were delivered from speakers, including law academics, judges, Law Commissioners and advocates, statisticians and forensic science practitioners. The programme greatly benefited from the expert contributions from colleagues from the USA and England. Each presentation was followed by a plenary session which maximised collective engagement with the debates and ensured everyone was exposed to all of the arguments. A solid core of eight participants attended every session, including two of the four international expert contributors. This enabled a clear and sustained focus throughout the programme.

[2] Carloway Review, Consultation Paper at 3. http://www.scotland.gov.uk/Resource/Doc/925/0116090.pdf

[3] Carloway Review Report, http://www.scotland.gov.uk/About/CarlowayReview

[4] http://www.thefingerprintinquiryscotland.org.uk/inquiry/75.html

# 2. Thematic focus of workshops

## a. Key themes addressed

The workshops addressed a number of research questions[5] grouped under these key themes:

- The rules for admissibility of scientific evidence
- The complexities of determining the reliability of scientific science
- The implications of forensic scientific techniques for human rights

Each workshop presentation and subsequent discussion tackled at least one question and invariably others as the level of the debate deepened over time through growing shared understandings and insights across the disciplines, sectors and jurisdictions. Separately, other questions emerged allowing the programme team to re-focus the research inquiry both during and between workshops.

## b. Workshop 1: Admissibility of Scientific Evidence

The title of the first workshop was **The Admissibility of Scientific Evidence.** The workshop focussed on the legal and scientific foundations regarding admissibility of scientific evidence (See Appendix 2 for detailed schedule). The legal foundations were considered in presentations from the perspective of three different jurisdictions – Scotland from an academic specialising in evidence law, England & Wales (from a Law Commissioner) and the US State and Federal Courts (from a State Trial Judge in Pennsylvania). The scientific foundations, specifically the practices in forensic science, were covered by presentations from a representative from the Scottish Police Services Authority who set out the UK position. The US perspective was provided by a representative of the Forensic Enterprise Division, Analytic Services Inc. Commentaries were offered on these foundations drawing out the problematic issues and suggesting potential solutions.

The main issues which emerged were, first, the legal threshold for admissibility of emerging science. In relation to this participants noted that the Scottish judiciary avoid a gate-keeping role which partially explains the dearth of Scottish case law examining the role of expert witnesses. Another issue was how best to determine the expertise of witnesses particularly when the definition of expertise, the relationship between experience, competence and expertise, and who qualifies as an expert are not settled matters. The final issue concerned how jurisdictions that have abolished the corroboration rule safeguard against unsafe evidence. In the absence of a corroboration rule, as the Carloway Report recommends for Scotland,[6] the concept of reliability acquires enhanced prominence. Reliability has different meanings within the legal and the scientific communities but its significance is a dominant concern of both (this issue was developed in Workshop 2).

It was noted that this was an opportune time for an inquiry into the law of evidence, and in particular, of expert scientific evidence, in Scotland, as there is to be an amalgamation of all eight forces into one, and reinstatement of forensic science provision under the umbrella of the Scottish Police Force. Other issues that emerged from this workshop included the recognition that an efficient regulatory regime, the peer

[5] See Appendix 1 for the full list of research questions.

[6] Para 7.3.19 at p. 299.

review process, and the blogging community can each make important distinctive contributions to the pursuit of reliability. Reliable science is essential if juries are to be asked to attach weight to it.

## c. Workshop 2: The Validation of Science

The title of the second workshop was **The Validation of Science.** Here the focus was on how the scientific community, or indeed the judiciary, determines whether science is sufficiently reliable to be offered as evidence in court. One prominent issue was how best to use probabilistic reasoning, exemplified by likelihood ratios, to help validate scientific and other techniques, for example by providing robust measures of any uncertainty associated with them, and to ensure they withstand rigorous cross-examination. The issue of reliability and its distinctive disciplinary meanings was another of the dominant themes. The concept of reliability embraces all dimensions of the use of scientific evidence from the quality and measurement of expertise to the methodologies of validating science and the regulatory environment within which forensic science is conducted. Each presentation and many of the discussions confronted reliability in one guise or another. Its significance was examined closely in the third workshop which concentrated on identifying proposals for reform required in Scotland to improve reliability in law, science and their respective operating environments.

This workshop also explored in greater detail the role of expert forensic evidence, focussing on its limitations as well as its potential benefits for the courts. There was a presentation from an expert in the application of statistics to forensic science on the communication and interpretation of statistical evidence in the administration of criminal justice. This was based on the first report in a series of four on this topic by the Statistics and Law working group of the Royal Statistical Society. The emphasis of the first report was on the fundamentals of probability and statistical evidence in criminal proceedings. The other reports will cover DNA profiling, networks for evidence evaluation, and case assessment and interpretation.

The 2010 ruling of the English Court of Criminal appeal in *R* v*T* [7] and the use of probabilistic ideas which arose from that ruling, was discussed during the workshop. The scientific presenters provided an account of identification evidence in the USA, and two UK perspectives that considered the application of developing techniques in forensic anthropology in two specific contexts, namely: the limitation of assessment methodologies in estimating the ages of living children and young adults; and the techniques being developed at Dundee University's Centre for Anatomy and Human Identification (CAHid) in identifying the perpetrators of sexual offences from photographs of their hands. These new techniques were used in the prosecutions in 2009 arising from Operation Algebra, the code name given to the investigation and dismantling of the largest paedophile ring in Scotland.[8] The senior prosecutor in charge of that case described how evidence had been deployed to secure the first conviction in Scotland for conspiracy to commit sexual offences as well as a series of convictions on charges involving offences related to indecent photographs of children and also of committing offences in relation to the sexual abuse of young children. The total number of convictions, unprecedented in scale and form, represent a major breakthrough in the investigation and prosecution of child sexual abuse that was reliant in part on novel science.

[7] *R* v *T* [2010] EXCA Crim 2439.

[8] See separate accounts of this Operation from the Police and Crown at: http://www.crownoffice.gov.uk/News/Releases/2009/05/11141634

The Operation Algebra prosecution exemplifies the potential human rights defences that could be engaged through the implications for the presumption of innocence of seeking to rely upon photographic evidence of intimate parts of the body. The issues which need further attention here centre on the specific evidential and procedural implications of a law which requires suspects in sex abuse and internet child pornography cases to co-operate with the photographing of their body. One important question, yet to be resolved, are the conditions in which the preparation and use of such evidence is incompatible with the human right not to self-incriminate and to bodily integrity, a fair trial, privacy, and the prohibition of degrading treatment.

This workshop produced a significant number of issues for further consideration. These were:

- The need for institutional reliability of expert scientific evidence, not just reliability of individual contributions.
- The importance of consistency of approach within court rulings on reliability.
- The need for clarity over the characterisation of science as "objective" or "subjective".
- The need for further consideration by the courts of the use of likelihood ratios in the evaluation and interpretation of evidence.

## d. Workshop 3: Next steps

The title of the third and final workshop was **Next Steps Planning** and its purpose was to identify the overarching ideas and issues that were debated in the programme and to agree the way forward to bring these to the attention of appropriate decision-makers and more generally to prepare knowledge exchange outputs. Two of the strands which this workshop identified would be heavily shaped by reports that were expected to be published by the end of 2011: the Carloway Review and the Fingerprint Inquiry. Further strands were still being developed and unlikely to be concluded until late 2012. These were:

- The issues arising from the current EU project promoted by the Presidency through the EU Law Enforcement Working Party – specifically the proposal for common standards for forensic science across the EU, including common standards for such issues as validation. Forensic science is a subset of the wider category of expert evidence, but the issues are broadly identical. This will obviously affect Scotland as a country with autonomy over its legal system.
- The impact of the proposed amalgamation of Scottish police forces
- Progress within the Ministry of Justice on the implementation of the (English) Law Commission proposals for expert evidence in criminal trials.
- How the (English) Law Commission recommendations might be taken forward in Scotland.

# 3. Programme outputs

## a. Background material and documentation of the workshops

*The following were produced prior to or during the programme:*

1. PowerPoint presentations for workshop presentations.

2. A paper presented at the Society of Legal Scholars Annual Conference 2011: *Some ethical tensions in the admissibility of scientific evidence in the courtroom.*

*The following were produced during the programme:*

1. Audio recordings of selected presentations from the workshops.

2. Repository of scientific and law publications on wider uses of admissibility of scientific evidence

3. Transcriptions of discussions from selected workshops.

## b. Participants peer-reviewed publications directly linked to the programme

1. P.R. Ferguson, "Repercussions of the Cadder case: the ECHR's fair trial provisions and Scottish criminal procedure" (2011) 10 *Criminal Law Review* 743-757

2. F.E. Raitt, "The Carloway Review - An Opportunity Lost" (2011) 15(3) *Edinburgh Law Review* 427-431.

## c. Anticipated peer reviewed publications

1. Journal article aimed at *Legal Studies* of Society of Legal Scholars conference paper.

2. Papers responding to the forthcoming Scottish Fingerprint Inquiry.

3. Paper analysing law and science relationship in Scots law in SSRN (online Social Science Research Network).

4. Papers examining whether, and to what extent, Scotland should follow the English Law Commission's Expert Evidence report and its legislative recommendations.

5. Paper exploring the consequences of the abolition of the rule of corroboration in Scots law in relation to admissibility of scientific evidence.

## d. Non-peer reviewed publications relevant to the programme

1. Papers in: Scots Law Times, Law Society of Scotland Journal Online, SCOLAG.

2. Chapters in *Advances in Forensic Human Identification* (ed. Xanthe Mallett).

## e. Other relevant activities anticipated

1. Reports on scope for regulation and law reform to Scottish Government and the Scottish Law Commission.

2. Development of integrated new module, Forensic Science and the Law to run in 2012 taught jointly to science and law students at Dundee University at both honours level and postgraduate level.

3. Discussions on provision of CPD.

4. Discussions on alternative ways of expressing results in cases involving hands' identification.

5. An application for funding via a multidisciplinary platform to address identification/pattern recognition issues.

6. An application for funding to ESRC regarding assessment of mock trial scenarios and juries' responses to different types of expert forensic scientific evidence.

## f. Added value of the programme and its potential impact

The work emerging from this programme would not have happened but for the opportunities offered through the SUII research funding. The immediate principal benefit was in bringing together lawyers and scientists from many different backgrounds and three separate jurisdictions which enabled entirely new streams of collaboration to form.

The main objective of the programme was achieved and some fresh ones arose.

Numerous research issues are being pursued in other contexts and with new collaborators encountered during, or as a result of, the programme, e.g. two funding applications to other research bodies. Knowledge exchange from an interdisciplinary perspective is planned for practitioners. Moreover, because of the presence of COPFS at the Workshop, a forensic case has been forwarded to CAHid for investigation. Also, there was an immediate impact on the content of publications from CAHID, primarily due to the presence of postgraduate students. The discussions were very important to the way that they presented their arguments in their dissertations.

In terms of potential impact the timing could hardly be more favourable in the wake of the Law Commission's Expert Evidence Report in England, the report from the Carloway Review in Scotland and the forthcoming publication of the Scottish Fingerprint Inquiry.

## g. Conclusions and recommendations

The Programme brought together lawyers, judges, scientists and statisticians to consider whether the Scottish law of evidence was fit for purpose in the digital and global age in which we live. Useful comparisons were made with other jurisdictions which have had to consider similar issues. We conclude that there is a real danger of future miscarriages of justice unless the system for admitting scientific evidence in criminal trials becomes more robust. Both organisational and individual competences are essential to this. Two frameworks need to be developed - one for establishing organisational competence, and one for individual competence, with each organisation being responsible for the competence of its employees. Forensic science techniques and methodology ought to be validated by publication of scholarly articles in peer reviewed journals.

The courts must perform a gate keeping role in ensuring that only robust scientific evidence is led in criminal trials. The English Criminal Procedure rules specify the requirements for an expert's report.[9] Similar rules should be enacted for Scotland.

It is apparent that there needs to be a greater understanding on the part of lawyers (prosecutors, defence counsel and judiciary) of scientific methodology, probabilistic reasoning and statistical analysis, and a greater appreciation of the law's requirements in relation to legal proof, on the part of scientific experts, particularly those called upon to testify at criminal trials.

[9] http://www.justice.gov.uk/guidance/courts-and-tribunals/courts/procedure-rules/criminal/docs/crim-pr-2010-part33.pdf See in particular rule 33.3.

We therefore recommend that:

- Students undertaking the Diploma in Professional Legal Practice at Scottish law schools be given training in understanding probability, statistics, and the scientific method.
- The judiciary be offered seminars on probabilistic reasoning.
- The (English) Law Commission's recent proposals on expert evidence be considered for adoption in Scotland.
- A working group be established to draft and promulgate primers for the judiciary on forensic science techniques, such as DNA evidence, fingerprint evidence, etc. (see the current work of the Statistics and Law working group of the Royal Statistical Society, referred to above).
- The Codes of practice being developed by Andrew Rennison, the UK Forensic Science Regulator, be considered for adoption in Scotland.

# Appendix 1: Programme research questions

Fourteen research questions were addressed:

1. How does the scientific community determine whether science is sufficiently reliable to be offered as evidence in court?

2. What is the legal threshold for admissibility of emerging science?

3. How do the rules governing admissibility shape the production of evidence that uses emerging scientific techniques?

4. Does the Scots corroboration requirement safeguard against unsafe scientific or other forensic evidence?

5. How do jurisdictions that have abolished corroboration safeguard against unsafe evidence?

6. What is the evidential value of emerging forensic techniques in identification of perpetrators?

7. What is the evidential weight of expert testimony that a suspect's image displays notable similarities to that of a perpetrator?

8. When are scientific or other related techniques sufficiently robust to justify likelihood ratios and probability statistics, and to withstand rigorous cross-examination?

9. At what point is expert testimony required- when is it beyond the ability of lay fact-finders (judge or jury) to draw their own conclusions?

10. How can the expertise of witnesses be determined?

11. What are the implications of a law which requires suspects in sex abuse and internet child pornography cases to co-operate with the photographing of their anatomy?

12. Do rules governing admissibility strike the right balance between accused and the State?

13. What are the human rights implications – is co-operation a form of self-incrimination, and thus a breach of the right to a fair trial?

14. Is the preparation and use of such evidence compatible with the human rights to: bodily integrity, a fair trial, privacy, and the prohibition of degrading treatment?

# Appendix 2: Presentations delivered at each workshop

| **Workshop 1** | |
|---|---|
| **Name** | **Title** |
| Fiona Raitt | The admissibility of scientific evidence in Scots law |
| Stephanie Domitrovich | Frye and Daubert: Gates for Evaluating and Admitting Relevant and Reliable Scientific Evidence in US State and Federal Courts |
| David Ormerod | Workshop 1 |
| Tom Nelson | Problems of admissibility from the point of view of a scientific expert witness |
| Burkhard Schafer | Blogs and other user generated content as evidence of acceptability within the scientific community |
| Max Houck | The American perspective on problems of admissibility of scientific evidence |
| Niamh NicDaeid | Challenges to the credibility of expert witnesses |

| **Workshop 2** | |
|---|---|
| Colin Aitken | Statistical issues in the communication and interpretation of expert evidence in the administration of criminal justice |
| Lucina Hackman | An accepted technology being applied in new ways: The application of age assessment methodologies for identification, judicial and immigration purposes |
| Sue Black | Novel science: Hand identification as an emerging technique |
| Dorothy Bain QC | The legal implications: A prosecutor's point of view |
| Jim Fraser | Expert evidence in Scotland – a systematic perspective |

| | |
|---|---|
| Annalise Whittaker | The ethics and legality of cyber identity |
| Mike Redmayne | Subjectivity, Objectivity, Reliability |
| David Kaye | Courtroom presentation of identification evidence |
| Andrew Rennison | The Role of the Forensic Science Regulator |
| Michael Risinger | A taxonomy of expertise |
| Patrick Leyden | The practicalities of getting such a framework enacted: the process of acceptance of new scientific techniques in other jurisdictions |

# Appendix 3: List of participants

| Name | Affiliation/organisation | Geographic origin |
|---|---|---|
| Sue Hunter | School of Psychology, University of Stirling | Scotland |
| Tom Welsh, QC | Director of Judicial Studies, Edinburgh | Scotland |
| Michael Bromby | School of Law and Social Science, Glasgow Caledonian University | Scotland |
| Dorothy Bain, QC | Faculty of Advocates | Scotland |
| Matthew Premble | Technical Director, Idrach Ltd | Scotland |
| Brian Caddy | Scottish Criminal Cases Review Commission | Scotland |
| Claire McDiarmid | School of Law, University of Strathclyde | Scotland |
| John Hamilton QC | Faculty of Advocates | Scotland |
| Geri Watt | Crown Office & Procurator Fiscal Service | Scotland |
| Lorraine Sweeney | Crown Office & Procurator Fiscal Service | Scotland |
| Mohammad Sadiq | Crown Office & Procurator Fiscal Service | Scotland |
| Alison McKenna | Crown Office & Procurator Fiscal Service | Scotland |
| Ruaraidh Macniven | Civil Recovery Unit, COPFS | Scotland |
| Ross Brown | LLM student, University of Dundee | Scotland |
| Katie Nicoll Baines | PhD Candidate | Scotland |
| Helen Meadows | PhD candidate | Scotland |
| Sir Gerald Gordon | Scottish Criminal Cases Review Commission | Scotland |
| Murdo Macdonald | Church of Scotland SRT Project | Scotland |
| Fiona Maclean | Scottish Criminal Cases Review Commission | Scotland |
| Stephanie Domitrovitch | Judge, Pennsylvania | USA |
| Aaron Susmarski | University of Dayton, Ohio Law School | USA |
| David Ormerod | English Law Commission | England |
| Tom Nelson | Scottish Police Services Authority | Scotland |
| Graham Jackson | University of Abertay, Dundee and Advance Forensic Science | Scotland |
| Annalise Whittaker | Defence, Science and Technology Laboratory | England |
| James Chalmers | School of Law, University of Edinburgh | Scotland |
| Lucina Hackman | Centre for Anatomy and Human Identification, University of Dundee | Scotland |
| Burkhard Schafer | Edinburgh University | Scotland |
| Anjali Mazumder | Statistical Consultant | England |
| Max Houk | Forensic Enterprise Division, Analytic Services Inc | USA |

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|---|---|---|
| Niamh NicDaeid | Centre for Forensic Science, University of Strathclyde | Scotland |
| James Fraser | Centre for Forensic Science, University of Strathclyde | Scotland |
| David Kaye | The Dickinson School of Law, Penn State University | USA |
| Patrick Leyden QC | Scottish Law Commission | Scotland |
| Michael Risinger | Law School, Seton Hall University | USA |
| Charles Welsh | Skills for Justice | England |