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SCIENCE IN COURT

Science is increasingly used in court, where it appears in a variety of guises. Equipment used to gather evidence for the courts may be well-established (for example, breathalysers) or its scientific validity may still be in question (for example, lie detectors). Scientists themselves may act as expert witnesses, presenting evidence in courts. This briefing note will consider how courts determine what science to accept, the options for accrediting science and expert witnesses and how disagreements between scientists are managed.

Background

How often does science appear in court?

In criminal courts, the frequency with which forensic evidence is used depends on the offence. In cases of murder, forensic science evidence is almost always presented. Scientific evidence is also increasingly used in more common crimes such as burglary or car theft; when DNA evidence is available, the detection rate for domestic burglary goes up from 15% to 45%[1]. The Forensic Science Service (FSS), a Home Office agency designed to meet the forensic needs of specific police investigations (Box 1), dealt with 140,000 cases in 2004–2005, and its staff appeared in court as expert witnesses for 2,500 of those[2]. In civil courts, experts are often individual professionals such as medical doctors or psychologists testifying on matters such as personal injury or child welfare. The Legal Services Commission (LSC), providers of legal aid, estimates it spends £130 million each year on experts' fees, mainly on civil, family and immigration cases.

Scientific techniques

Currently, a scientific technique does not have to pass any formal test in order for evidence derived from it to be allowed before a court. It is up to the judge at each trial to decide whether a particular piece of evidence can be admitted. This allows courts to take advantage of the very latest developments in scientific knowledge.

Box 1. The forensic science market[1]

- In criminal cases, most forensic work is commissioned by the prosecution team of the Police and the Crown Prosecution Service. The defendant's legal team may also commission forensic work, either to check or challenge the prosecution's scientific evidence or to ascertain the defendant's innocence.
- The market as a whole is worth an estimated £400 million a year.
- Most forensic work for the prosecution is done in-house by the Police Forces' own forensic personnel. This makes up 52% of the forensic science market. The remaining forensic work, a mix of prosecution and defence work, is placed with an external provider of forensic services.
- Of the 48% provided externally, the FSS holds around 40%. The majority of the remaining share is held by a private company (LGC), which has recently acquired its main competitor in forensic services, Forensic Alliance.
- The FSS, currently a Home Office agency, will become a Government-owned company in December 2005.
- The Association of Chief Police Officers (ACPO) is responsible for developing national strategy for efficient use of forensics by the police, deployment of police staff and procuring forensic services from third parties.

However, concerns remain over how reliable evidence from some techniques can be. In 1998, a jury convicted a defendant after they concluded that he had left a unique ear-print on a window. Later, a DNA sample retrieved from the ear-print proved that the ear-print was not the defendant's, and he was freed[3]. In the USA, scientific techniques are routinely evaluated against certain established criteria before their results can be accepted by the courts (Box 2).

Expert witnesses

An expert witness is allowed to give an opinion to the court on matters which they may not have seen directly, but in which they are expert. Anyone who can convince a judge that their knowledge, skills or training make their testimony of value to the courts can act as an expert witness in a particular case. A professional qualification is not required. Within science, expert witnesses come

from a wide range of disciplines from acoustic engineering to zoology. Often, expert witnesses are presenting work commissioned by police services in support of criminal prosecutions, usually being employed by the police service directly or by one of the main forensic science providers. Their expertise is gauged from their professional training and employment experience.

Box 2. Evaluating scientific techniques

US states use either the Frye or Daubert test to decide whether a piece of evidence can be submitted to the court.

The Frye test

The Frye test requires that techniques have gained general acceptance in the scientific community to which they belong. However, it is difficult to decide how to define a relevant scientific community. For example, in forensic computing, there is no leading professional body and the boundaries of the community are hard to define.

The Daubert test

The Daubert test was introduced by the US Supreme Court in 1992. It considers four factors:

- whether the technique can be and has been tested;
- whether it has been subject to peer review / publication;
- what the known or potential error rate is;
- whether the evidence has widespread acceptance in the scientific community.

For example, the method a geologist used to estimate the quality and quantity of stone stolen from a government community pit was admitted in court through a Daubert hearing[4]. But the testimony of a forensic toxicologist relying on a theory that exposure to certain chemicals had led to the defendant's cancer was not allowed under Daubert[5]. There are arguments for and against Daubert-style tests. Such tests could help establish whether evidence from controversial methods should be admitted in court by making explicit reference to their error rates. However, some think that Daubert tests bias against scientific work that has been prompted by the legal case itself (because it hasn't had time to gain widespread acceptance or be published).

However, many other scientists who act as expert witnesses are not employed full-time in providing evidence for the legal system. Indeed, courts may prefer an expert who is an active practitioner in their profession[6,7]. This is especially true of medical experts in civil cases such as personal injury claims. Courts gauge the witness's expertise by enquiring into relevant matters such as their employment history, membership of professional bodies and experience of similar work. There are no clear criteria for the designation of someone as an 'expert', although there are a number of bodies that represent expert witnesses or maintain registers or membership lists (Box 3).

Issues

Overseeing scientific evidence

Many scientific procedures, such as DNA analysis, are now routinely accepted by the courts as giving reliable evidence. However, the very basis of other techniques is subject to dispute.

Box 3. Expert witness bodies

- The Academy of Experts provides accreditation, training, and support on technical issues. It is also a source of accredited expert witnesses governed by codes of practice backed up by disciplinary procedures.
- The Council for the Registration of Forensic Practitioners (CRFP) is a professional regulatory body that manages a register of currently competent forensic practitioners. It was set up in 1999 with an initial (and ongoing) subsidy from the Home Office to ensure standards amongst forensic science personnel. Entry requirements focus on current competence judged by peer review of recent casework. Registration must be revalidated every 4 years.
- The Expert Witness Institute trains and educates experts.
- The Forensic Science Society is a professional body which publishes a journal, awards qualifications and organises conferences.
- The Society for Expert Witnesses provides a network of expert witnesses.

These organisations have varying codes of conduct and entrance criteria. All except the Forensic Science Society provide directories of expert witnesses for potential employers. CRFP focuses on professional forensic scientists in the criminal courts and has accreditation as an explicit aim. As such, it has traditionally had a different function from other expert witness organisations, which generally represent and develop expert witnesses.

Many argue that tests should be established to validate scientific evidence in the UK. In March 2005, the House of Commons Science and Technology Select Committee (S&T Committee) reviewed the use of science in court[1]. It recommended that a Forensic Sciences Advisory Council (FSAC) should be established "to oversee the regulation of the forensic science market and provide independent and impartial advice on forensic science". The Government is consulting with stakeholders on the issue of quality regulation in forensic science.

In the US, Daubert hearings (Box 2) are a part of legal procedure, presided over by a judge, for ruling on the admissibility of evidence. However, the S&T Committee suggested that "judges are not well placed to determine scientific validity without input from scientists". The FSAC, as a source of scientific input, could have one or more of a variety of roles (Box 4).

Quality assurance of expert witnesses

Registration with CRFP

CRFP membership (Box 3) has been suggested as the default marker of quality assurance for scientific expert witnesses. Lord Justice Auld recommended that "the several existing expert witness bodies providing for all or most forensic science disciplines should consider amalgamation with, or concentration of their resources in, the CRFP"[6]. In November 2004, the LSC published a consultation paper, exploring the use of CRFP membership as a mark of quality assurance. In practice, this might mean that more justification would be required for the use of non-CRFP registered experts. The S&T Committee suggested that "there will be a strong case for CRFP registration being made mandatory for experts in

those specialities presenting evidence to the courts". This is most applicable to well established areas where a large pool of experts use agreed and tested methods.

Box 4. Potential roles for the FSAC

Various roles have been proposed for the FSAC:

- Overseeing the regulation of the forensic science market (Box 1). At present there is nobody in a position to oversee the entire forensic process from collection and analysis of samples to expert evidence in court.
- Developing a "gate-keeping" test of expert evidence, as recommended by the S&T Committee. Taking decisions on admissibility of evidence out of the hands of judges would be a significant change to the legal system.
- Coordinating the evaluation of novel forensic techniques and technology. Forensic service providers have their own internal validation procedures for new techniques, but there is no framework to ensure that all forensic providers work to the same standards.
- Ensuring that there are standardised procedures for carrying out certain tests, such as blood alcohol testing. For example, each provider is currently free to choose whether to rely on one test or to check reliability by testing the blood a second time.
- Administering an accreditation system for laboratories and their personnel. In the US, the American Society of Crime Laboratory Directors operates such a system, sending experienced auditors into labs to check standards.
- Playing a role in genuine scientific disputes about the interpretation of large classes of evidence, such as recovered memories or shaken baby syndrome. Rather than taking decisions itself, it could maintain resources for lawyers and judges.

CRFP is unique in that it was set up specifically to address concerns about the quality of forensic practitioners. However, other expert witness organisations such as the Academy of Experts now also offer accreditation and argue that the differences between the organisations are in the details of the accreditation process rather than the principles. In its response to the S&T committee, the Government recognised that despite its support for CRFP, it would not be appropriate for it to mandate registration with one private organisation rather than another.

CRFP and other accreditation bodies

CRFP could work in conjunction with accreditation schemes run by other bodies which would be mutually recognised by CRFP. It has put forward 12 criteria to be adopted by a satisfactory accreditation scheme. Questions arise, however, as to the financing of such schemes and accompanying disciplinary procedures. Some expert witness bodies are also concerned that CRFP will become a state-sponsored monopoly. LSC may recognise other expert witness organisations, but believes that currently only CRFP has sufficiently disinterested and rigorous accreditation procedures.

Scope of CRFP registration

Currently CRFP only deals with certain forensic disciplines, but it is expanding to cover more disciplines, such as forensic computing. The LSC has identified psychiatrists, psychologists, pathologists, independent social workers and accountants as priority groups for accreditation.

There is no suggestion that all court experts should be CRFP registered. Some experts may only ever be called once. For example, a dispute involving environmental planning law might call a botanist to testify about the distribution of a rare plant species. However, CRFP is unlikely to establish a procedure for registering forensic botanists because there are too few practitioners and too few cases. The Academy of Experts has advocated that an expert should be allowed to give evidence a certain number of times before accreditation is required.

Peer review

Peer review, as a method of assessing fitness for registration, is open to criticism. Experts who wish to see their field grow in size may be unduly lenient; conversely, experts may wish to exclude rivals within their own specialism. Peer review is regarded as inherently conservative and might deprive the courts of novel expert evidence which could be sufficient to cause reasonable doubt. However, few alternatives to peer review exist. The S&T Committee recommended "regular independent auditing of the assessment processes" of CRFP.

Accreditation in civil and family courts

CRFP originally concentrated on forensic specialities appearing in criminal courts but is expanding into disciplines that commonly appear in civil and family courts. Some question whether CRFP is appropriate for experts who give evidence in these courts. Many doctors, for example, act as expert witnesses in addition to their regular employment and are already overseen by their own Royal College and regulated by the GMC. The Association of Personal Injury Lawyers and the Family Justice Council believe that CRFP registration will be another financial and administrative burden and will discourage doctors from undertaking expert witness work.

Shortages of expert witnesses

In family courts, there is an acknowledged shortage of medical experts. Negative media coverage has been partially blamed for doctors' increasing unwillingness to testify in court and, in particular, problems in recruiting paediatric pathologists and community paediatricians. Many scientific and medical professionals may also be reluctant to act as expert witnesses because of a limited understanding of legal procedures and requirements.

The Bar Council and the S&T Committee recommended that the Department for Constitutional Affairs should make funding available for expert witness training. However, the Government believes this should be the responsibility of professional bodies. Some Royal Colleges already run schemes to introduce specialist registrars to medico-legal work; an expansion of this scheme is planned. More formalised entry routes to expert witness work could both improve experts' understanding of their role and increase participation in areas where there are shortages. In computer forensics and digital evidence recovery, for example, backlogs of up to 2 months exist. Expertise in information technology might be untapped

because no formalised introduction to the work of an expert witness exists in this area.

A report from the Royal College of Paediatrics and Child Health and the Royal College of Pathologists encouraged the National Health Service (NHS) to recognise the value of expert witness work and be willing to release doctors to appear in court. NHS consultant contracts do allow doctors to include regular expert witness work in their job plan. Arrangements for more irregular expert witness work can be agreed with Local Negotiating Committees.

Disagreements between experts

When there are disagreements in a criminal court about the meaning of scientific evidence, the adversarial nature of the courtroom can make things confusing for a jury. It would also seem inherently problematic to ask a non-expert jury, tribunal or judge to decide on matters so contentious that two experts cannot agree.

Single joint experts

In civil cases, courts can appoint a single joint expert instead of allowing each party to have their own expert. This can work well when there is no disagreement over the single joint expert's account. However, either party can also employ shadow experts to check or challenge the work of the joint expert. If either party is dissatisfied with the single joint expert, they can have another expert appointed. Introducing single joint experts into criminal cases could thus add to their complexity.

The possibility of having a court-appointed expert, as well as experts for the defence and the prosecution, has been explored. This extra expert would help the jury or judge understand the evidence. Lord Justice Auld, however, concluded that court-appointed experts would automatically, but undeservedly, be accorded greater authority by a jury than either of the other experts and therefore bias the court[6].

Pre-trial meetings of experts

Narrowing down the areas of disagreement over scientific evidence might be achieved through pre-trial meetings between experts. These are increasingly used in civil cases. The Civil Justice Council have enshrined the principle of early and full disclosure of expert evidence in their recent 'Protocol for the Instruction of Experts to give evidence in civil claims'. The Criminal Case Management Framework and Criminal Procedure Rules 2005 encourage pre-trial meetings in criminal cases. Pre-trial meetings might also establish if a disagreement is so fundamental that the matter cannot be decided 'beyond reasonable doubt' and the case should thus not proceed.

Specialist courts and non-jury trials

Cases involving particularly complex scientific evidence could be considered using a pool of judges and lawyers who are specialists in forensic science. Those arguing against this option suggest that if only a few judges are seeing all cases of a particular type, justice will suffer. Because DNA and forensic evidence is increasingly being used, many argue that a wider understanding of scientific evidence should be achieved for all barristers and members of the judiciary through continuing professional development. The S&T Committee recommended "that judges be given an annual update on scientific developments of relevance to the courts" and that the Bar introduce compulsory training in forensic evidence. The Government has recommended that the judiciary should have access to any useful information, possibly via the Judicial Studies Board's website.

The Criminal Justice Act 2003 provides for complex fraud trials to be heard without a normal jury. The S&T Committee recommended research into this possibility for trials with a complex scientific component. Civil liberties groups strongly oppose these proposals.

Presentation of scientific evidence

Efforts could also be made to help juries process complex scientific matters and to lessen the impact of external factors, such as the charisma of an expert, on a jury. Facilities could be made available in courtrooms and lawyers and experts could be encouraged, wherever possible, to use visual representations and reconstructions to communicate to the jury what has been done. Any training for expert witnesses could also emphasise the importance of communicating the science simply. This would help the jury to form an opinion on the evidence rather than on the expert.

Overview

- Science and scientists appear regularly in both civil and criminal courts in the UK.
- The courts rely on the adversarial system to ensure the quality of scientific evidence or scientific experts.
- The S&T Committee has suggested formal markers of quality for science and scientists in the legal process.
- There are shortages of some types of forensic technicians and expert witnesses.
- Changes to court procedures could allow more effective resolution of disputes over scientific evidence.

Endnotes

1 House of Commons Science and Technology Committee Forensic Science on Trial, 7th report, session 2004/05
2 www.forensic.gov.uk/forensic_t/inside/about/docs/04_05.pdf
3 R v Mark Dallagher, UK Court of Appeal [2003] EWCA Crim 1903
4 www.kscourts.org/ca10/cases/2001/11/00-4141a.htm
5 caselaw.lp.findlaw.com/data2/circs/2nd/027913p.pdf
6 www.criminal-courts-review.org.uk
7 Law Society Response to consultation on *Competitive tendering for criminal legal aid*, The Law Society, 2005

POST is an office of both Houses of Parliament, charged with providing independent and balanced analysis of public policy issues that have a basis in science and technology. POST is grateful to Joanne Lawson for researching this briefing, to the British Psychological Society for funding her parliamentary fellowship, and to all contributors and reviewers. For further information on this subject please contact Dr Bella Starling at POST.

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