Chapter 5

Trial

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Introduction

5.1 This chapter considers the use of bioinformation evidence after a police investigation, when the decision to prosecute a suspect has been taken. The 'matching' of a fingerprint or biological sample found at a crime scene with a suspect will have an impact upon decision making at the charging stage of the criminal process, and such evidence will be used to support the progress of a case to trial, and at the trial. Forensic bioinformation evidence cannot be considered infallible (if only because of the involvement of humans), and a fingerprint or DNA 'match' alone will rarely be conclusive evidence of guilt. Therefore, care needs to be taken over the use of forensic bioinformation evidence throughout the criminal process, including during prosecutions.

Pre-trial considerations

5.2 Forensic bioinformation matches (see Box 4.2 on police terminology) can be influential in determining the progress of a case and whether a prosecution will proceed. Police and solicitors have reported to us that the positive matching of a fingerprint or biological sample found at a crime scene with a suspect can persuade many defendants to plead guilty (and indeed legal advisers to recommend this). Early guilty pleas clearly save time and money for the criminal justice system. However, sound evidence of such savings, supported by statistics, is not yet available. Care must be taken to ensure that suspects are not placed under undue pressure to plead guilty when faced with forensic bioinformation evidence, as it may be inconclusive. Such evidence requires careful interpretation in the context of the case as a whole, and it may be wrong to assume guilt on the basis of this evidence alone.

5.3 In some instances, a 'match' will be very powerful evidence of guilt, whereas in others it may prove of little relevance or value in assisting a prosecution (for example when the identity of the defendant is not an issue in the case). In many cases there may be an innocent explanation for the presence of a defendant's fingerprint or DNA at the scene of a crime. The strength (or 'probative value') of fingerprint or DNA 'match' evidence thus depends upon the circumstances of each case and should not automatically lead to a decision to prosecute. Indeed, the Crown Prosecution Service (CPS) guidelines clearly state that a DNA 'match' cannot be the sole basis of a prosecution.[1]

5.4 The CPS has introduced a 'staged reporting' process (see paragraph 4.30), whereby cases can be 'speeded up' where there is DNA evidence. Staged reporting is designed to minimise unnecessary work and delays by focusing on the matters relevant to the case in question. For example, where rape is alleged, but the issue is one of consent as the defendant does not deny sexual intercourse, there is no need for a full evaluative statement dealing with the identity of the defendant. By writing to the defence legal advisor early in the prosecution process, the prosecution identifies the issues in the case that are to be disputed by the defence. Such an approach aims to establish whether any significant issues rest on the scientific evidence. If so, the CPS then assesses whether the DNA evidence requires 'full evaluative analysis' (a full report by a forensic scientist) rather than simply the documentation indicating an initial 'match' made by a computer.

5.5 Since the launch of this 'speeded up' approach, time and cost savings have been claimed by the CPS although it concedes that an accurate measure of financial and time savings is not possible.

1. *Guidance for Cases Involving DNA: Processing DNA Samples for Abbreviated and Full Evaluative Statements – Staged Reporting*. This guidance updates the Prosecution Team DNA Guidance issued in August 2004.

However, the CPS has stated that in 2005/06 the Forensic Science Service (one of the providers of DNA analysis for the National DNA Database (NDNAD)) received 1,887 requests for an abbreviated statement reporting an initial match (cost approximately £100), which were followed by 175 further requests for a complex or full evaluative statement (cost approximately £600). Prior to the staged reporting process, all 1,887 requests would have been for the more expensive evaluative statements (approximate cost £1,132,200) yet the abbreviated statements cost approximately £293,700, saving £838,500 (or a 74 per cent saving).[2] (This of course presumes that full evaluative statements would actually have been pursued in all of these cases.) An abbreviated statement is also much more quickly produced, freeing time in the laboratory. It is claimed that the application of this approach to a greater variety of cases would further save time and money, but take-up of the approach has, to date, not been universal across all police areas.

Defence and disclosure difficulties

5.6 In order that a defendant has the opportunity to challenge a fingerprint or DNA match, or its interpretation, it is vital that all DNA and fingerprint evidence is disclosed (in a timely manner) to the parties. Several miscarriages of justice have highlighted the problem of non-disclosure of evidence to the defence. It is essential that, when a prosecution case relies upon a fingerprint or DNA match, the defence parties have the ability to examine this evidence and subject it to their own analysis and interpretation. Defence experts may have many tasks, including:

- Verifying prosecution evidence and undertaking further tests if necessary. (However, there are often obstacles to re-testing as it is rare for there to be disputes between scientists, and the necessity of re-testing must be shown. There may be resistance to the borrowing of notes or facilities and samples, with priority given to the prosecution. Finally, costs of testing for the defence may be prohibitive.)
- Clarifying findings and interpretations of prosecution evidence (often to overcome the lack of scientific understanding on the part of the lawyers involved).
- Advising the defence legal team on how to challenge the prosecution case.
- Providing testimony on an alternative finding or interpretation of evidence.[3]

It is, however, expensive to employ an independent expert to examine prosecution fingerprint or DNA evidence or to do re-testing (and can add considerable delay). Prior authority from the Legal Services Commission[4] is needed for the costs to be recovered, and budgetary demands mean that approval for such expenditure is rarely given unless there is some positive evidence pointing away from guilt.

5.7 Full and timely disclosure is essential so that decisions can be made as to the need for an independent expert. There remains concern over whether all experts appreciate their duty to the court to disclose any material that might undermine the prosecution case or assist the defence case. Following revelations of serious cases of non-disclosure, in particular of experts' reports, steps have been taken to provide advice to experts involved in criminal proceedings, as well as the establishment of a general disclosure regime since the passing of the Criminal Procedure and Investigations Act 1996.

5.8 Nevertheless, there remains some contention over which information must be disclosed. Moreover, the disclosure regime is highly discretionary and does not demand the disclosure of

2. National DNA Database (2007) *The National DNA Database Annual Report 2005–2006*, p10.

3. Roberts P (1994) Science in the criminal process *Oxford Journal of Legal Studies* **14:** 496–506.

4. The Legal Services Commission is responsible for legal aid in England and Wales. A similar requirement applies to payments from the Scottish Legal Aid Board.

preliminary reports, which may reveal scientific dispute or disagreement at an early stage of testing procedures, instead disclosing only the final, consensus report. The evidence of an earlier dispute or disagreement over a match may be important to a defence case, and a simple match report may not prove sufficient as the basis for constructing the defence case if this precludes critical assessment of the DNA evidence. Our fact-finding meetings revealed that some experts believed that differences of opinion that had been expressed in a laboratory were not disclosable, and that the defence would be required to seek out any details of disputes that may have an impact upon the certainty with which evidence can be approached. The scope of the obligation to disclose relevant and unused material is therefore in need of clarification.

5.9 **We recommend:**

- **Compulsory and timely disclosure of *all* fingerprint bureau or DNA laboratory results and relevant records to all parties involved, including details of any dispute over an identification, rather than presenting only the consensus view reached.**
- **In expert witness statements and reports, this duty of disclosure should be explicitly acknowledged and the experts should confirm that they have complied with this duty.**

Forensic bioinformation evidence at trial

5.10 In research studying the impact of DNA evidence on trials in Australia, it was found not only that cases with DNA evidence were more likely to reach court, but also that DNA evidence (and incriminating fingerprints) assumed great strength in influencing jury decisions, with juries 33 times more likely to convict where prosecutors produced DNA evidence.[5] In a US study, the presence of DNA evidence resulted in a variance in sentencing severity, with DNA convictions leading to harsher sentences.[6] The authors concluded that "one inescapable fact remains: DNA testimony is already having a significant, if little understood, impact on rendering justice in serious felony cases".[7] If bioinformation evidence is similarly persuasive in England and Wales, and such impacts are also occurring in English and Welsh courts,[8] it makes it vital that bioinformation evidence is properly presented in court, and fully understood by juries and legal professionals alike, to prevent miscarriages of justice.

5.11 Although the reliability of fingerprint comparison is under increasing scrutiny, and the standard for fingerprint match reporting changed significantly in 2001 (see paragraphs 2.4 and 5.14), fingerprint evidence is very rarely ruled inadmissible at trial. In the case of forensic DNA evidence, in early cases in the late 1980s and early 1990s, the courts questioned the reliability and validity of this new evidence, but initial challenges have been resolved (in tandem with advances in science and technology which have removed much ambiguity, see paragraphs 2.9–2.14). Currently there is an expectation of admissibility, unless the defence can present a strong argument against the admission of the evidence. Despite such a presumption in favour of admitting DNA evidence, there remain some issues of potential concern. In particular, the accurate presentation of complex scientific and statistical information to a non-scientific audience (which of course includes most of the legal profession as well as the jury) can be particularly difficult.

5. Briody M (2002) The effects of DNA evidence on sexual offence cases in court *Current Issues in Criminal Justice* **14(2)**: 159–81, 170; Briody M (2004) The effects of DNA evidence on homicide cases in court *Australian and New Zealand Journal of Criminology* **37(2)**: 231–52.

6. Purcell N, Thomas-Winfree L and Mays G (1994) DNA Evidence and Criminal Trials: An exploratory survey of factors associated with the use of 'genetic fingerprinting' in felony prosecutions *Journal of Criminal Justice* **22(2)**: 145–57, 153.

7. Purcell N, Thomas-Winfree L and Mays G (1994) DNA Evidence and Criminal Trials: An exploratory survey of factors associated with the use of 'genetic fingerprinting' in felony prosecutions *Journal of Criminal Justice* **22(2)**: 145–57, 156.

8. It may be that this is of less concern in Scottish Courts, where there is a legal requirement for corroboration of all evidence.

5.12 It is almost impossible to comprehensively eradicate the potential for confusion among the legal professionals (barristers, judges, magistrates, court clerks, etc.) and jury members, as well as the defendant, victims and members of the public. What can be properly inferred from forensic bioinformation evidence may be either exaggerated or understated by those who are called upon to make a judgment based upon such technical evidence. Popular media representations of the power of fingerprint or DNA evidence may exacerbate such difficulties in courtrooms.

Presenting scientific evidence

5.13 At trial, forensic scientists are afforded special privilege in being able to give evidence of their opinions as well as fact. Their opinions can prove highly persuasive, making informed cross-examination of expert testimony vital. Those forensic scientists called upon to testify at trial clearly began their work on the case in question far earlier in the criminal process and may have carried out their analysis many months previously. Scientists are required to report on testing undertaken by the laboratory staff for whom they are responsible, and therefore present the results of tests that they did not perform themselves. It will most often be the final conclusions that will be presented, and any doubts or disagreements between scientists may not be reported. However, it may also be easy for advocates to give the impression that there is a dispute between experts where the real difference may simply be down to a choice of words. Where there is genuine scientific dispute, the limitations of the adversarial system, and in particular the courtroom as a site for resolving such dispute, can be magnified, and calling upon juries to decide upon guilt where there is scientific disagreement has the potential to lead to injustice.

5.14 As a result of the ruling in *R v Buckley,*[9] it has become clear that fingerprint evidence can no longer be presented in court as if it were a simple statement of fact that there is a match between a crime scene mark and an accused person's print. Expert evidence that identifies marks linking an accused person to a scene of crime is evidence of opinion based on examination of the materials using the skill and experience of the expert. It is important to remember that Judge Rose RJ ruled in *R v Buckley* that:

> "In every case where fingerprint evidence is admitted, it will be generally necessary, as in relation to all expert evidence, for the judge to warn the jury that it is evidence of opinion only, that the expert's evidence is not conclusive and that it is for the jury to determine whether guilt is proved in the light of all the evidence."

5.15 Thus fingerprint evidence should be presented in a similar way to the presentation of handwriting evidence, for example. However, fingerprint officers continue to assert that if three experts agree on a match then it is a '100% correct' match. Such a conclusion may not in fact be justifiable in the light of the change to a non-numerical standard in June 2001 (see paragraph 2.4). **We recommend that in presenting their opinion regarding a positive match or otherwise to the investigating officer, prosecution authority or court, fingerprint experts should make it clear that their conclusion is always one of expert judgment, and never a matter of absolute scientific certainty.**

Presenting DNA evidence

5.16 It is vital that DNA evidence is properly interpreted within the particular circumstances of the case, and not represented as providing definitive evidence of guilt. The weight to be given to DNA evidence and its presentation at trial were considered in *R v Doheny and Adams*.[10] A DNA

9. *R v Buckley* (1999) 163 JP 561.

10. *R v Doheny & Adams* [1997] 1 Cr. App. R. 369; see also Crim LR [1997] 669.

expert in *Doheny* testified that it was his opinion that the offender was the defendant. The trial judge directed the jury that if this evidence was to be believed, guilt had been conclusively proved. This was contrary to the proper interpretation of the DNA evidence, that whilst there was a very small group of other people that could match the DNA profile, the defendant was only one of this small group. In *R v Adams* (Gary), both the expert and prosecutor at this trial had committed the prosecutor's fallacy (see Box 5.1), though this did not invalidate the verdict because the defendant had also been positively identified by the victim. However, the Court of Appeal ruled that it was vital, in light of the increasing use of DNA evidence, that the profiling process be understood and that the manner in which the evidence is presented be made as clear as possible. There were two opposing views on the best way of presenting DNA evidence:

- reporting how rare the profile was in the population (known as the 'random occurrence ratio'); and
- reporting that, given the match of the DNA profile from the crime scene with that from the suspect, then, if the sample had come from someone other than (and unrelated to) the defendant, the probability of obtaining such a match was, for example, one in a million.

The Court of Appeal ruled in favour of the reporting the rarity of the profile in the population (the random occurrence ratio).

5.17 The Court of Appeal also set out guidelines to minimise the risk of misuse of DNA evidence including:

- any issue should be identified and resolved before trial in pre-trial review;
- the expert witness should not be asked his or her opinion on the likelihood that it was the defendant who left the crime stain, nor when giving evidence should he or she use terminology that may lead the jury to believe that he or she was expressing such an opinion; and
- it was inappropriate for an expert witness to expound a statistical approach for evaluating the likelihood that the defendant left the crime stain, because unnecessary theory and complexity divert the jury from their proper task.

5.18 The decision in *Doheny and (Gary) Adams* has not always been adhered to and there still remains confusion in some cases (see the Privy Council case of *R v Pringle*).[11] In the case of *R v Bates*,[12] there was a thorough examination of issues arising in cases where only a partial DNA profile was found at the crime scene, and yet the interpretation of the judgment itself was still subject to some confusion.[13] Such confusion surrounding statistics and their presentation and interpretation in court has been clearly highlighted in recent 'cot death' cases.

5.19 The Royal Statistical Society (RSS) has taken an interest in this area following its interventions in recent cases where statistics have been misrepresented during trials. The RSS became involved in the case of Sally Clark, who was convicted of murdering her two baby sons. In court, a paediatrician miscalculated the probability of two instances of sudden infant death syndrome (SIDS) occurring in the same family as 1 in 73 million. This statistic was used as evidence during the trial, as well as being widely reported outside the courtroom, despite being seriously flawed. The RSS expressed its concern in the media, and wrote directly to the Lord Chancellor, commenting:

> "Aside from its invalidity, figures such as the 1 in 73 million are very easily misinterpreted. Some press reports at the time stated that this was the chance that the deaths of Sally Clark's

11. *R v Pringle* [2003] UKPC 9.
12. *R v Bates* [2006] Crim EWCA 1395.
13. For a critical appraisal, see Cooke G (2007) More twists in the DNA saga *Archbold News* **9**: 2 November, p4.

two children were accidental. This (mis-)interpretation is a serious error of logic known as the Prosecutor's Fallacy. The jury needs to weigh up two competing explanations for the babies' deaths: SIDS or murder. Two deaths by SIDS or two murders are each quite unlikely, but one has apparently happened in this case. What matters is the relative likelihood of the deaths under each explanation, not just how unlikely they are under one explanation (in this case SIDS, according to the evidence as presented). The Court of Appeal has recognised these dangers … in connection with probabilities used for DNA profile evidence, and has put in place clear guidelines for the presentation of such evidence. The dangers extend more widely, and there is a real possibility that without proper guidance, and well-informed presentation, frequency estimates presented in court could be misinterpreted by the jury in ways that are very prejudicial to defendants."[14]

The RSS subsequently formed a working party on statistics and the law, to address some of the main issues. The working party has yet to report its findings and recommendations, which may be of relevance in cases involving DNA evidence.

Box 5.1: The prosecutor's fallacy

Debate concerning the precise definition of the 'prosecutor's fallacy' can become highly technical. The expression was first used by Thompson and Schumann, who described the problem:

> "The fallacy in the prosecutor's logic can best be seen if we apply his analysis to a different problem. Suppose you are asked to judge the probability a man is a lawyer based on the fact he owns a briefcase. Let us assume all lawyers own a briefcase but only one person in ten in the general population owns a briefcase. Following the prosecutor's logic, you would jump to the conclusion that there is a 90 per cent chance the man is a lawyer. But this conclusion is obviously wrong. We know that the number of nonlawyers is many times greater than the number of lawyers. Hence, lawyers are probably outnumbered by briefcase owners who are not lawyers (and a given briefcase owner is more likely to be a nonlawyer than a lawyer). To draw conclusions about the probability the man is a lawyer based on the fact he owns a briefcase, we must consider not just the incidence rate of briefcase ownership, but also the a priori likelihood of being a lawyer. Similarly, to draw conclusions about the probability a criminal suspect is guilty based on evidence of a 'match,' we must consider not just the percentage of people who would match but also the a priori likelihood that the defendant in question is guilty."[15]

For our purposes, we consider that the prosecutor's fallacy is committed whenever the recipient of the statistical evidence, upon hearing the evidence, believes that they have been told the likelihood of guilt or innocence which can then be considered without any reference to the prior likelihood of the defendant being guilty or innocent. This arises when the rarity of a particular profile (or the 'match probability' as many scientists call it) is presented as being interchangeable with the probability that the defendant is innocent, such that, for example, a profile with a rarity of 'one in a million' produces the false conclusion in the mind of the recipient of the evidence, that the chance of the defendant being innocent is 'one in a million'.

'One in a million' means that, in a country of, for example, 60 million people, there will be approximately 60 people with that profile. Without other evidence, the defendant is then no more likely than the other 59 with the same profile to be the actual offender. Looked at this way, the probability of guilt, not innocence, is about one in 60. Other evidence may, of course, change that probability.

If there is a full SGM+ match of the suspect's DNA and that recovered from a crime scene, then the rarity is expressed as 'of the order of one in a billion'. Even though this is very powerful evidence it does not by itself prove conclusively that the defendant was the source of the crime scene profile. There is still the possibility that somebody else (especially a close relative) may have the same profile.

5.20 The prosecutor's fallacy has bedevilled the use of DNA evidence in courts. It tends to take the form that the frequency of the occurrence of the profile in the population is described as a probability of occurrence and then this is taken to be the 'chance' of innocence. Arguably, the continued use of the 'match probability' wording rather than the 'rarity' or 'frequency' approach, can be said to contribute to the difficulties. Even though the 'match probability' wording does not, in itself, commit the prosecutor's fallacy, it tends to be widely misunderstood among the public, and poor reporting by journalists can perpetuate the confusion.

14. The full media release can be found at www.rss.org.uk (accessed on: 13 July 2007), Royal Statistical Society (2001) *Royal Statistical Society concerned by issues raised in Sally Clark* case, 23 October.

15. Thompson WC and Schumann EL (1987) Interpretation of statistical evidence in criminal trials: the Prosecutor's Fallacy and the Defense Attorney's Fallacy *Law and Human Behavior* **11(3)**: 167–87, 170.

5.21 The courts further considered the weight of DNA evidence in the cases of *R v Watters*[16] and *R v Mitchell*.[17] Watters was originally convicted of four burglaries based solely on a DNA match from cigarette butts found at the scene of burglaries, the prosecution relying upon the similarity of the burglaries to claim the same people had been responsible for each. The prosecution also relied on facts that the defendant was a smoker, lived locally and was male. The appellant argued that the DNA evidence was weak (there was only a partial profile giving a match probability of 1 in 79,000), and additionally that the defendant had a brother – which reduced the match probability further to 1 in 267. The DNA expert claimed that the DNA evidence should not have been used in isolation as this in itself did not constitute proof. The Court of Appeal concluded that the case should not have been put before a jury because of the confusion over the brothers (the other brother was also suspected of being in the burglary team). If the jury were not able to determine decisively that the defendant was guilty (and that, for example, it was not his brother who was the guilty party) then all the jury could do was acquit.

5.22 In *R v Mitchell* the appellant successfully argued that the fact that DNA swabs taken from the victim (which had been deposited by the perpetrator of the crime) did not match his DNA profile strongly supported his defence of mistaken identity. The trial judge had summed up at his trial that the DNA evidence was entirely neutral and could not assist the jury. The Court of Appeal disagreed, finding that a 'non-match' could indeed be powerful evidence in favour of the accused, which the jury should consider. The Court concluded that when considering DNA evidence, judges should take great care not to raise scientific speculative possibilities and so detract from evidence that the defence could rely upon.

5.23 Concerns over the presentation of DNA evidence are increased when considering the use of DNA analysis techniques that go beyond the standard methods of SGM+ profiling typically used (see Box 2.2). For example, there are differing views expressed by scientists and the forensic DNA analysis providers on the use of low copy number (LCN) techniques used when only very tiny amounts of DNA can be recovered from a crime scene (see paragraphs 2.30–2.31). Concerns about this technique focus upon the heightened possibility of contamination when very small amounts of material are amplified to obtain a profile. As an illustration, a scientist explained that LCN testing used in the following situation could be problematic: a doorknob is touched with a bare hand and that doorknob is later touched by a gloved hand, which then is used to handle an exhibit; DNA left on the doorknob by the first person could thus be present on the exhibit despite the fact that the first person had never come into contact with that exhibit.

5.24 While the technology enables a DNA profile to be obtained from a fraction of a nanogram (a billionth of a gram) of DNA, the possibility of contamination that could be given inappropriate significance is also greatly increased. The results may therefore be misleading, and yet they could be presented as powerful evidence in a courtroom. This makes it vital that defendants are not convicted on a DNA match alone. Crown Prosecutors must decide in their professional opinion at what point, in each case, there is sufficient corroborative evidence to proceed with a prosecution. In *R v Smith*,[18] Smith's appeal after conviction was rejected although the DNA match left him a suspect along with 43 other men in the United Kingdom, because there was also quite clearly evidence of him having been arrested after the offence a short distance away. However, such a ruling may raise a risk that individuals could be charged with a serious criminal offence on the basis of a circumstantial association with the crime scene represented by a DNA match between their DNA and biological material recovered from such a scene. Such a possibility is even more likely where techniques such as LCN DNA analysis are used (see Box 2.2).

16. CA (Criminal Division) unreported, 19 October 2000.
17. *The Times*, 8 July 2004.
18. *R v Smith* CA 9904098 W3 (8 February 2000).

5.25 The use of DNA analysis by LCN may be an example where the science has progressed further than the ability of courts to handle it properly, courtrooms being inappropriate sites for the resolution of scientific debates. Indeed, one important test of the admissibility of expert evidence is whether the science or technique has been peer-reviewed and is 'accepted' by the scientific community. It has been made clear to us that there remains significant scientific debate over the reliability of this technique, which should preclude its admissibility in courts until such a time as it is accepted by the forensic DNA community.

5.26 A DNA match should therefore only be used as circumstantial evidence pointing towards the guilt of the defendant. In the leading case of *Teper v R*,[19] the judge explained to the jury that they were permitted to infer the accused's guilt from circumstantial evidence as long as they were sure that there were no other co-existing circumstances that would weaken or destroy the inference. Usually, the inference suggested by the prosecution will be that there are few (or very few) people with a matching DNA profile and that there is other evidence consistent with the defendant being the perpetrator. The magistrates, or jury, will have to take account of other evidence – for example alibi evidence (or lack of it), differences in any description of the offender and the character of the defendant – and decide whether on all the evidence they can be sure of guilt.

Difficulties with scientific evidence

5.27 To be credible in court, experts must be not only expert in their field, but must also be expert in presenting evidence. However, it cannot be ruled out that jurors, as well as others in the courtroom, will have difficulty in following scientific evidence, while experts in court, just as in life outside the courtroom, can exert a great deal of influence, or can be partisan. Expert witnesses are explicitly under a duty to report to the court, and are not to present their evidence in such a way as to favour either the defence or prosecution case. Whether it is the prosecution or the defence that has instructed them to testify should therefore have no bearing on their evidence, although in reality this neutrality has not always been achieved.

5.28 Research has pointed to a series of possible problems with the level of understanding by the jury, including 'white coat syndrome', which is where the jury members are of the opinion that evidence can only be understood and 'disentangled' by experts. Further, there are language difficulties, with the nature and meaning of terms such as DNA requiring explanation. Jurors are required to enter the realms of both genetics and statistics, with some likely to be "unduly influenced by overtly probabilistic evidence because it exudes an 'aura of precision'".[20] Researchers in Australia note:

> "[T]he interpretation of DNA evidence requires expertise from several fields, notably genetics, statistics, laboratory technique, and crime-scene analysis. On a number of occasions, Australian courts have permitted a person qualified in a single field to present an opinion based on several fields."[21]

This phenomenon of experts testifying on areas beyond their expertise has been widely reported in the courts in England and Wales (for example, toxicologists testifying as to the cause of death, and see paragraph 5.19, where a paediatrician testified on statistics; indeed the RSS assert that only trained statisticians should be permitted to provide statistical evidence).

5.29 Researchers have also found that jurors have "high expectations for the significance of DNA

19. *Teper v R* [1952] A.C. 480 at 489.

20. Schklar J and Diamond S (1999) Juror reactions to DNA evidence: errors and expectancies *Law and Human Behaviour* **23(2):** 159–84, 160.

21. Gans J and Ubas G (2002) DNA identification in the criminal justice system, in *Trends and Issues in Crime and Criminal Justice*, No. 226 (Canberra: Australian Institute of Criminology), p4.

evidence. This may be based more on popular culture rather than scientific understanding. Such disproportionate expectations can produce frustration … but overall did not significantly diminish the jurors' belief in the probative importance of DNA."[22] This problem is exaggerated by the trend to incorporate DNA as an essential feature of prosecutions, the DNA evidence represented as 'compelling', with jurors' expectations of DNA "compounded through media representations of DNA as conclusive proof of a person's guilt".[23] In England and Wales, the law prohibits inquiries into jury deliberations so we can only use 'mock juries' to gauge how juries assess DNA evidence (or any evidence for that matter).

5.30 There are, however, reported examples of misunderstandings by judges, lawyers, police officers, journalists and even some forensic scientists. For example, we were informed by an accreditation body for forensic practitioners that it had previously discovered a forensic laboratory that was committing the prosecutor's fallacy in its written reports. While this and other flaws in their written reports may not have led directly to a miscarriage of justice, it clearly highlights failures in the oversight of forensic practitioners and laboratories. Training of forensic practitioners must address such issues to ensure that the highest standards are reached and maintained. A code of conduct should apply to all scientists working in forensic laboratories, and a commitment made to transparency, both of the operation of forensic laboratories and scientists, but also their accrediting bodies. Such transparency is fundamental to the fairness of the criminal process, with any concerns about forensic science standards in a particular case revealed to all parties.

5.31 It is therefore legitimate to assume that if scientists can make mistakes both inside and outside courtrooms, jurors may be making mistakes during their secret deliberations. In *R v Denis Adams*,[24] the Court of Appeal rejected the argument that the complexity of evidence was a ground upon which DNA evidence could be excluded. However, the Court ordered a retrial because the use by the defence of Bayes theorem (a logical method of weighing up different pieces of evidence) had: "plunged the jury into inappropriate and unnecessary realms of theory and complexity deflecting them from their proper tasks".

5.32 Respondents to our public consultation felt that juries required some preparation for weighing up evidence in the form of bioinformation, and that it should not be assumed that members of the public could readily understand the complexities of the science and statistics involved. It is the correct presentation of technical evidence that is critical to jurors' understanding and the proper carriage of justice. In recent observations during research undertaken in Australia, it was found that trial advocates were prone to misrepresenting the significance of DNA evidence, which then influenced juries.[25] However, preconceptions of jurors, largely determined by representations of forensic DNA evidence in popular culture, were found to have as great an impact upon the jury understanding of evidence as the actual presentation of the evidence to them during the trial. Most jurors expected the DNA evidence to be very significant prior to its presentation in court.

5.33 Such high expectations of the significance of forensic bioinformation makes essential the proper education of legal professionals, throughout the criminal justice system, to prevent the misrepresentation of evidence, or at least to ensure the recognition of flawed evidence or of the misrepresentation of evidence when it is presented. It also highlights the need for a thorough, transparent and stringent accreditation and oversight body for forensic practitioners, as well as for laboratories (see Chapter 7 for recommendations concerning governance issues).

22. Findlay M and Grix J (2003) Challenging forensic evidence? Observations on the use of DNA in certain criminal trials *Current Issues in Criminal Justice* **14(3)**: 269–82, 282.

23. *Ibid*., p274.

24. *R v Denis Adams* [1996] 2 Cr. App. R. 467 see also J of CL (1997) 61(2) 170 and Crim LR [1996] 898.

25. Findlay M (2007) Juror comprehension and the hard case – making forensic evidence simpler, *International Journal of the Sociology of Law*, forthcoming.

5.34 **In view of the difficulties with the presentation of complex statistical information in the courtroom, we recommend:**

- **that professionals (including judges) working within the criminal justice system should acquire a minimum standard of understanding of statistics, particularly with regard to DNA evidence;**
- **that trial judges ensure statistical evidence is accurately presented during trials, and that the decision in the *R v Doheny and (Gary) Adams* (1997) 1 Cr. App. R. 369 judgment regarding the correct presentation of DNA evidence is adhered to; and**
- **that in all cases where bioinformation evidence is adduced, introductory information should be made available to jury members, to ensure some basic understanding of the capabilities, and also the limitations, of such evidence.**