



House of Commons
Science and Technology
Committee

Forensic Science on Trial

Seventh Report of Session 2004–05



House of Commons
Science and Technology
Committee

**Forensic Science on
Trial**

Seventh Report of Session 2004–05

Report, together with formal minutes

*Ordered by The House of Commons
to be printed 16 March 2005*

The Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Office of Science and Technology and its associated public bodies.

Current membership

Dr Ian Gibson MP (*Labour, Norwich North*) (Chairman)
Paul Farrelly MP (*Labour, Newcastle-under-Lyme*)
Dr Evan Harris MP (*Liberal Democrat, Oxford West & Abingdon*)
Kate Hoey MP (*Labour, Vauxhall*)
Dr Brian Iddon MP (*Labour, Bolton South East*)
Mr Robert Key MP (*Conservative, Salisbury*)
Mr Tony McWalter MP (*Labour, Hemel Hempstead*)
Dr Andrew Murrison MP (*Conservative, Westbury*)
Geraldine Smith MP (*Labour, Morecambe and Lunesdale*)
Bob Spink MP (*Conservative, Castle Point*)
Dr Desmond Turner MP (*Labour, Brighton Kemptown*)

Powers

The Committee is one of the departmental Select Committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No.152. These are available on the Internet via www.parliament.uk

Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at www.parliament.uk/s&tcom
A list of Reports from the Committee in the present Parliament is included at the back of this volume.

Committee staff

The current staff of the Committee are: Chris Shaw (Clerk); Emily Commander (Second Clerk); Alun Roberts (Committee Specialist); Hayaatun Sillem (Committee Specialist); Ana Ferreira (Committee Assistant); Robert Long (Senior Office Clerk); and Christine McGrane (Committee Secretary).

Contacts

All correspondence should be addressed to the Clerk of the Science and Technology Committee, Committee Office, 7 Millbank, London SW1P 3JA. The telephone number for general inquiries is: 020 7219 2793; the Committee's e-mail address is: scitechcom@parliament.uk

Contents

Report	<i>Page</i>
Summary	3
1 Introduction	5
2 Background	6
What is forensic science?	6
Key organisations	6
Forensic Science Service	6
Home Office	6
Police	8
Use of forensic science by the criminal justice system	8
Intelligence-led policing	9
DNA Expansion Programme	10
Forensic services market	12
3 Changing Status of the FSS	13
Decision to move to PPP	13
Recent history of the FSS	13
McFarland Review	13
Attitudes towards PPP	15
GovCo	20
Next steps	23
Market in forensic services	24
Regulation of the market	26
4 National Databases	29
National DNA Database	29
History	29
Taking and retention of samples	30
Custodianship arrangements	34
New applications	38
Platform technology	40
Other national databases	42
5 Education and Training	43
University courses	43
Accreditation scheme	45
Implications for pure science	46
Training of forensic scientists	47
Police training	48
Identification of best practice	50
Implications of GovCo/PPP	52
6 Research and Development	54

Home Office and police R&D	54
Police Science and Technology Strategy	54
Funding for R&D	55
Other sources of funding	55
EPSRC Think Crime Programme	56
Exploitation of research	56
Implications of GovCo/PPP	58
Intellectual property rights	59
7 Use of Forensic Evidence in Court	60
Expert witnesses	60
Role of experts	60
Council for the Registration of Forensic Practitioners	60
Presentation of evidence	63
Training of experts	64
Adversarial system	66
Single joint experts	67
Pre-trial meetings	67
Services for the defence	68
Presentation of risk and probability	70
Presentation of DNA evidence	70
Communication between scientists and legal profession	71
Juries	72
Scrutiny of expert evidence	74
Systems failure	74
Admissibility of expert evidence	75
Early warning system	76
Training of judges and lawyers in forensic evidence	78
Lawyers	78
Judges	79
Specialist judges and lawyers	80
Conclusion	81
Conclusions and recommendations	82
Formal minutes	90
Witnesses	91
Written Memoranda	92

Summary

Forensic science is a vital instrument for the detection of crime and the administration of justice. The Forensic Science Service (FSS) plays a critical role in the delivery of forensic services to the criminal justice system and has established itself as a world leader in forensic science. In this inquiry we sought to investigate the likely implications of the Government's plan to develop the FSS as a Government owned company (GovCo) and possibly a public-private partnership (PPP). This Report welcomes the fact that, during the course of this inquiry, the Home Office stated its intention to fully test the GovCo model for the FSS, rather than automatically progressing to a PPP. However, we regret the confusing way in which the Home Office announced this decision: the mixed messages it sent out have only added to the uncertainty over the future of the FSS. The staff of the FSS have contributed enormously to building the reputation of the organisation and are essential to its future success. We urge the Home Office and senior management at the FSS to take positive steps to address the concerns of staff and rebuild confidence within the organisation. The lack of adequate independent oversight of the process of developing the FSS into a GovCo and possibly a PPP is unsatisfactory and we call for the Government to improve the transparency of this process.

In addition, we identify a need for the Government to implement measures to ensure that the criminal justice system has uninterrupted access to the full range of forensic services of the required quality standards and at affordable prices. We recommend that a Forensic Science Advisory Council be established to act as a regulator of the forensic services market, and to provide a much needed overview of the process by which forensic science is used in the criminal justice system. In light of the changing status of the FSS, the Council could also provide a source of independent impartial advice on forensic science to the Government, police and others. We further criticise the fact that the Home Office has failed to establish an independent body to oversee the work of the National DNA Database, or to make adequate provision for ethical and lay input. We additionally note the need for better management of the technology transfer process to facilitate exploitation of academic research with potential for application to crime prevention and detection technologies.

Although we accept that flaws in expert evidence are unlikely to have led, in isolation, to a significant number of miscarriages of justice, it is impossible to determine the number of cases which have been adversely affected by the conduct of an expert, or the handling of expert evidence in court. We emphasise that where miscarriages of justice have arisen in association with problems in expert evidence, this reflects a *systems* failure. We recommend various measures to improve the handling of expert evidence in court, including better provision of training for expert witnesses, lawyers and judges. We also recommend the establishment of a Science and the Law Forum and a Scientific Review Committee within the Criminal Cases Review Commission, to promote communication between the scientific and legal professions and to provide for ongoing scientific scrutiny of expert evidence.

1 Introduction

1. Crime is estimated to cost the UK economy around £50 billion each year.¹ Forensic science is a vital instrument for the detection and deterrence of crime, and the administration of justice. In the UK, around 85% of forensic services are delivered by the Forensic Science Service (FSS). On 17 July 2003 the then Home Secretary, Rt. Hon. David Blunkett MP, announced the Government's intention to develop the FSS as a public-private partnership (PPP).² The decision was welcomed by the management of the FSS, but greeted with dismay by the trade unions representing the majority of FSS staff.

2. We announced our inquiry into forensic science on 21 July 2004. Our aim was to investigate the likely impact of the Government plan to develop the Forensic Science Service as a public-private partnership on the competitiveness of the FSS and on the effective provision of forensic science services to the criminal justice system. We also sought to examine the quality of forensic science education and training and the supply of skilled personnel in forensic science; levels of investment in forensic science R&D; and the use of forensic science, including novel forensic technologies, in criminal investigations and court proceedings. We have concerned ourselves with the criminal justice system in England and Wales only and have not addressed the systems in Scotland or Northern Ireland, or the use of forensic evidence by HM Customs and Excise.

3. In the course of this inquiry we held five oral evidence sessions, during which we heard from:

- Home Office officials and the FSS;
- The Council for the Registration of Forensic Practitioners, the Forensic Science Society, private sector providers and trade unions;
- The Association of Chief Police Officers and academics;
- The Crown Prosecution Service, the Bar Council and a Crown Court judge; and
- The Parliamentary Under-Secretary of State for Reducing Organised and International Crime, Police Science and Technology, Anti-Drugs Co-Ordination and International and European Issues.

The transcripts of these sessions are published with this Report, together with the 34 written submissions received in response to our call for evidence and requests for supplementary information. We are grateful to all those who have contributed to this inquiry and would also like to place on record our thanks to our specialist advisers: David Blakey, formerly one of Her Majesty's Inspectors of Constabulary; and Professor David Barclay, formerly Head of Physical Evidence, National Crime and Operations Faculty.

1 *Safety in Numbers*, Audit Commission, 1998

2 17 Jul 2003: Column 62WS

2 Background

What is forensic science?

4. Forensic science is science used for the purposes of the law. We have adopted a broad definition of the term and include the full spectrum of forensic science from basic research to applied technology. Thus, the term “forensic science” here refers not only to the typical services offered by the main forensic science providers, such as toxicology, DNA, hair, fibre, footwear, toolmark, firearms, drugs and document analyses; but also to the research that underpins the development, testing and introduction of new forensic technology. Forensic pathology, the examination of human bodies to determine the cause and manner of death in criminal or suspicious circumstances, is also included within this definition. Fingerprints (usually referred to as fingermarks) are obviously part of forensic science as well, but we have not considered the arrangements for their effective use separately in this Report.

Key organisations

Forensic Science Service

5. The Forensic Science Service (FSS) is an Executive Agency of the Home Office. The Agency, through its seven laboratories and more than 2,500 staff, delivers forensic science services to the 43 police forces in England and Wales, the Crown Prosecution Service and HM Customs and Excise. The four main services through which the FSS supports the criminal justice system are:

- Scientific analysis and interpretation to support criminal investigations;
- Maintenance of the National DNA Database;
- Analysis of DNA for inclusion on the National DNA Database; and
- Expert testimony in support of prosecutions.

In addition, the FSS carries out R&D, fulfils advisory functions to Home Office Ministers, and undertakes some private sector and international work. In 2003–04 the FSS had a turnover of £149 million.³

Home Office

6. The Home Office is the Government Department with responsibility for the use of forensic science in the criminal justice system. Effective use of forensic science will be required to enable the Home Office to meet at least three of its seven Public Service Agreement (PSA) targets:

- PSA target 1: Reduce crime and the fear of crime; improve performance overall, including by reducing the gap between the highest Crime and Disorder Partnerships areas and the best comparable areas.
- PSA target 2: Improve the performance of all police forces, and significantly reduce the performance gap between the best and worst performing forces; and significantly increase the proportion of time spent on frontline duties.
- PSA target 3: Improve the delivery of justice by increasing the number of crimes for which an offender is brought to justice to 1.25 million by 2007–08.

Figure 1: Science and technology in the Home Office

Science Policy Unit

The Science Policy Unit of the Home Office (SPU) has responsibility for developing and delivering policy on police use of science and technology. This includes the development and implementation of the overarching Police Science and Technology Strategy (see paragraph 116), in addition to programmes such as the DNA expansion programme and the prisoner DNA sampling programming. The SPU also acts as a sponsor unit for the Forensic Science and Forensic Pathology Services.

The Police Scientific Development Branch

The Police Scientific Development Branch (PSDB) is a core unit of the Home Office that provides impartial advice and technical, operational and policy support to Ministers, Home Office policy units and the police themselves. The PSDB evaluates, develops and advises on science and technology equipment and techniques.

Police Standards Unit

The Police Standards Unit (PSU) aims to raise standards and improve operational performance in the police forces and in crime reduction in general. The PSU measures and compares performance between forces, with the objective of understanding the underlying causes of performance variations, identifying and disseminating good practice and supporting those who need assistance. The PSU forensic science team works with the Association of Chief Police Officers, the SPU and Her Majesty's Inspectorate of Constabulary to identify good practice and reduce variability in police forensic processes. The PSU has also been leading a "cold case" review programme in collaboration with the DNA Expansion Programme and the FSS. The review programme has identified 215 cases that were mainly undetected serious sexual offences for which DNA samples were able to be recovered and analysed. Twenty five per cent of these cases have now produced matches on the National DNA Database (NDNAD) leading to the identification of 34 named suspects.

Other Home Office sources of science and technology

The Police Information Technology Organisation (PITO) is a Non-Departmental Public Body (NDPB) responsible for managing the development of national IT and communications systems for the police. Together with the PSDB and FSS, PITO forms one of the three main providers of science and technology services and advice to the police. Other sources of science and technology and related advice used by the Home Office and police include the Defence Science and Technology Laboratory (DSTL) and private sector companies.

Source: Home Office

7. Our 2003 Report on the scientific response to terrorism noted the "weak scientific culture in the Home Office" and we heard in this inquiry that there were "black holes" in its understanding of forensic science.^{4,5} The Government, in its Response to our Report on terrorism, "accepted the need to continue developing the use of science within the Home Office" and told us that it was "confident that the scientific culture across the Home Office will continue to improve through the work of Professor Wiles [the Chief Scientific Adviser

4 House of Commons Science and Technology Committee, Eighth Report of Session 2002–03, *The Scientific Response to Terrorism*, HC 415-1

5 Q 375

to the Home Office] and the Home Secretary”.⁶ We have been surprised by the conspicuous absence of input from Professor Wiles during this inquiry. In response to our inquiries, the Home Office told us that Professor Wiles was “clearly aware of the way in which corporate policy is being developed and will have been copied into quite a lot of material”.⁷ The Home Office subsequently noted that one of his advisers had also been part of the project group overseeing the transformation of the FSS.⁸ Nevertheless, **the low visibility of the Home Office Chief Scientific Adviser is a source of concern, particularly in view of the history of weak scientific culture in the department.**

Police

8. The Association of Chief Police Officers (ACPO) forms a single point of reference for the 43 police forces of England and Wales. ACPO is the professional association of the chief officers of these police forces and has responsibility for the following:

- Formulating guidance for the service, e.g. for interpretation of new legislation.
- Speaking for its members when appropriate, for example with regard to the Service’s relationship with the Home Office.
- Serving as a professional advisor on policing matters to the Home Secretary.
- Co-ordinating the Service’s response when it needs to act as a single force, in times of national emergency or when there is a major or catastrophic incident.

9. Each of the 43 police forces in England and Wales employs scientific support staff. The titles may differ slightly, but typically a police force will have a Scientific Support Manager (SSM) and a number of Scenes of Crime Officers (SOCOs). Scientific Support Managers serve as heads of the administrative departments that co-ordinate the work of SOCOs, manage budgets for forensic science and fingerprints, and assist in the development of forensic science policy within the forces. They may have a scientific, business or police background but very few are police officers. SOCOs are employed to visit scenes of crime to look for DNA, fingerprints or other traces; again, very few of them are police officers. Some will be graduates, others will have come from a variety of backgrounds. They will all have attended training courses both locally and nationally. Training for police staff is discussed further in paragraph 104.

Use of forensic science by the criminal justice system

10. Forensic science is critical to the efficiency and effectiveness of the criminal justice system. The main contribution that forensic science makes to the criminal justice system is the generation of intelligence to assist investigations: the provision of actual evidence to convict the guilty or exculpate the innocent represents a small, although very significant, part of its role. DNA profiling, sometimes called DNA fingerprinting, is perhaps the most well known forensic technique and an increasing number of investigations rely on DNA

6 Cm 6108

7 Q 538

8 Q 535, footnote by the witness

evidence. Data are not available on the numbers of convictions that have been aided by the availability of DNA evidence. However, it is known that in 2002–03 there were more than 21,000 detections in crimes where a DNA profile had been obtained, a 132% increase since 2000.⁹ HMIC has described DNA analysis as “by far the most significant breakthrough in crime detection since the inception of fingerprint identification”.¹⁰

11. An overview of the process by which forensic evidence is obtained and used by the criminal justice system is provided in Figure 2. In summary, once a crime has been identified, potential evidence at the scene (or on the victim or suspect) is identified and recovered, usually by SOCOs, although in more serious cases forensic scientists from the forensic service providers may also be involved. Fingerprints found at scenes are checked against national databases directly by police forces. Other potential evidence, some of which will be recovered in the laboratory rather than at the crime scene, is subjected to detailed examination and analysis using a range of techniques. (e.g. DNA tool marks, glass, shoe prints etc.). The value of any forensic evidence is critically dependent on the interpretation of the scientific test result, necessitating an awareness and understanding of the particular circumstances of the case in question. The choice of items to be submitted for testing, and the priority awarded to them, also has a major impact on the benefit to the investigation that is derived from forensic analysis. Furthermore, appropriate action needs to be taken by the police once the forensic test results become available. The power of forensic science to facilitate the administration of justice is therefore entirely dependent on the ability of the police, and others, to use it effectively.

12. The Thematic Inspection Report, *Under the Microscope*, and its follow-up, *Under the Microscope Refocused*, carried out by Her Majesty’s Inspectorate of Constabulary (HMIC) in 2000 and 2002 respectively identified a number of problems with the use of forensic science by police forces.^{11,12} These included the failure of senior officers to “champion” the scientific support function, a lack of performance data on volume crime and scientific support, and difficulties associated with crime scene attendance and in managing the process of turning identifications into detections. See paragraph 109 for further discussion of best practice in forensic science in the police force.

Intelligence-led policing

13. Since *Under the Microscope* and *Under the Microscope Refocused*, police forces have put significant effort into improving policies on scene attendance by SOCOs to help them manage and cost their work more effectively, and into measuring performance. It is now increasingly realised that scientific support staff are more effective when fully integrated into the whole intelligence and investigative process. This in turn reflects the recognition that forensic science can play a key role in the intelligence-led approach to policing enshrined in the National Intelligence Model that was adopted by ACPO in 2000. The Model represents the collected wisdom and best practice in intelligence-led policing and law enforcement and has played an important part in police reform, helping senior

9 Home Office, *DNA 21st Century Crime Fighting Tool*, July 2003

10 Home Office, *Under the Microscope*, Her Majesty’s Inspector David Blakey, July 2000

11 Home Office, *Under the Microscope*, Her Majesty’s Inspector David Blakey, July 2000

12 Home Office, *Under the Microscope Refocused*, Her Majesty’s Inspector David Blakey, June 2002

managers to provide strategic direction; make tactical decisions about resources; and manage risk.¹³ The growing exploitation of forensic evidence for intelligence purposes is a key factor in the effective operation of the National Intelligence Model.¹⁴

DNA Expansion Programme

14. The increasing emphasis on forensic intelligence stems, in part, from the availability of large searchable national databases of forensic evidence. The Metropolitan Police Service, for example, told us of the “strategic shift” that had “taken place in the use of forensic science following the development of forensic intelligence databases that identify suspects rather than provide evidence for the courts”.¹⁵ The most significant database in this regard is the National DNA Database (NDNAD) which has undergone a substantial expansion programme over the past five years. The Home Office DNA Expansion Programme provided £186.2 million to the police forces in England and Wales between April 2000 and March 2004.¹⁶ The aim of the funding was to enable the police to take a DNA sample from all known active offenders and to increase the retrieval and use of DNA material left by offenders at scenes of volume crime e.g. burglary and vehicle crime. There are now more than 2.7 million criminal justice samples on the NDNAD and 243,627 crime stain records.¹⁷ The National DNA Database and DNA Expansion Programme are discussed further in chapter four.

13 <http://www.ncis.co.uk/nim.asp> and <http://www.police.uk/nim2/>

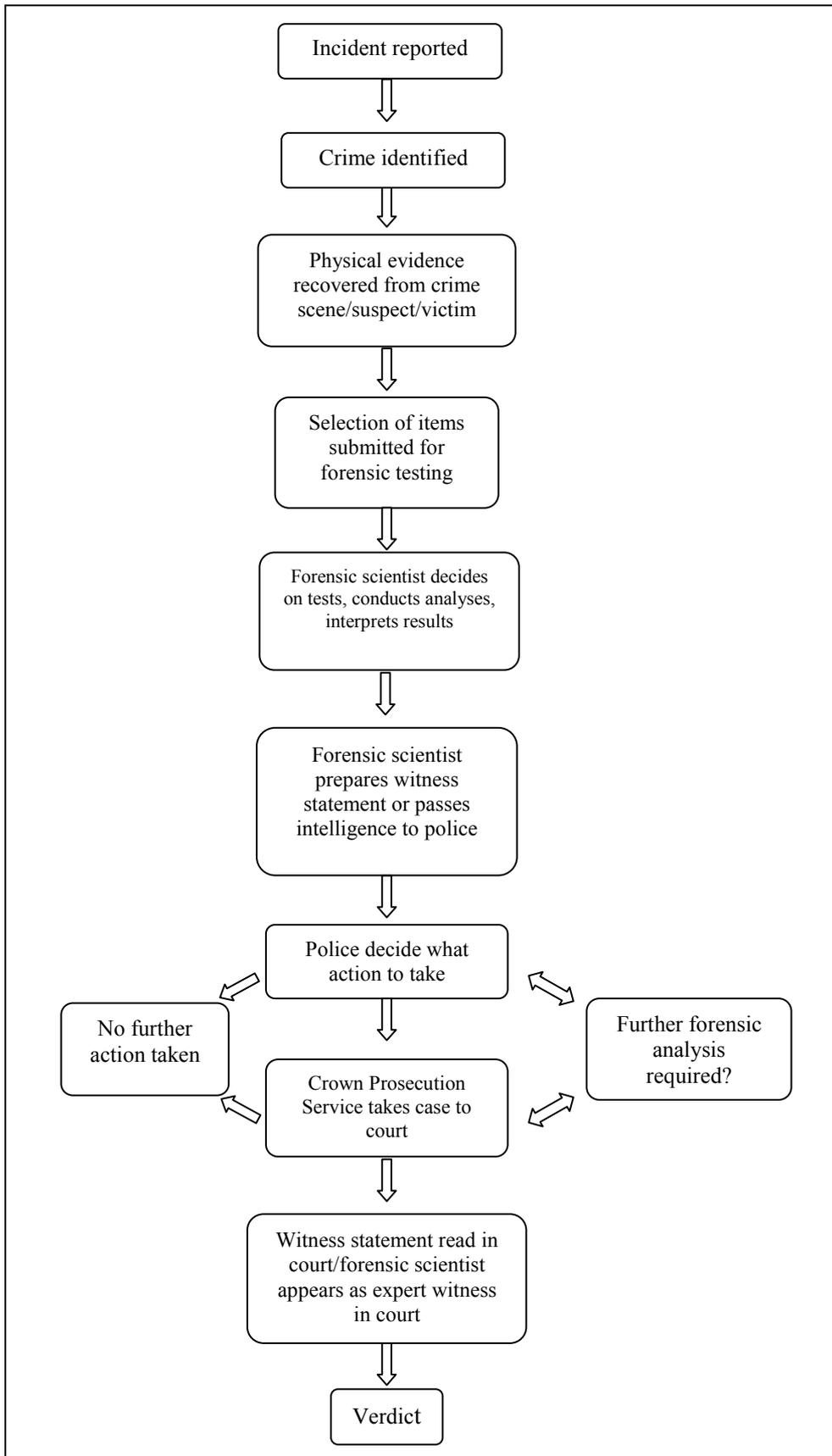
14 Ev 113

15 Ev 113

16 Forensic Science Service, *The National DNA Database Annual Report 2003–04, 2004*

17 *Hitting the mark, Jane’s Police Review*, 18 February 2005

Figure 2: The use of forensic science by the criminal justice system

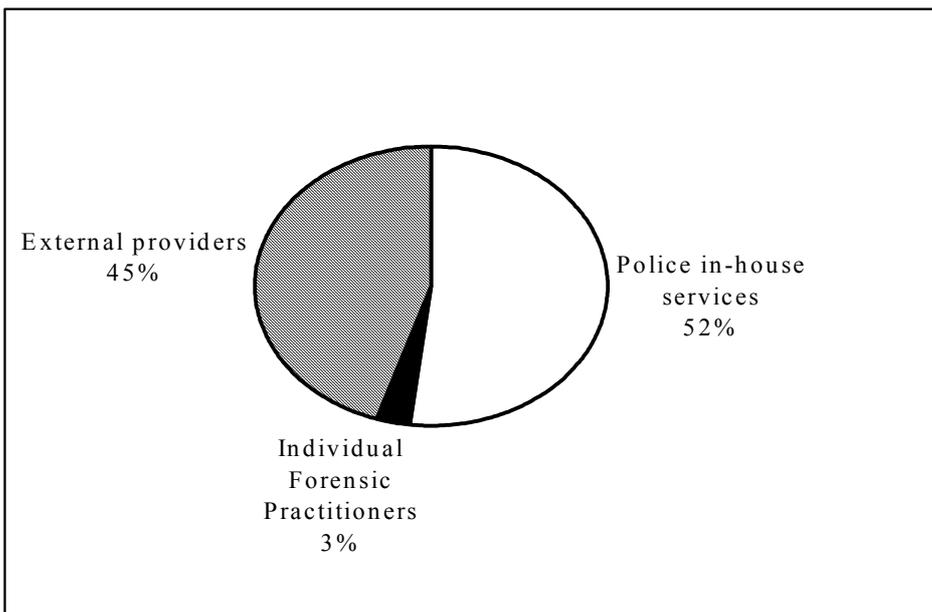


Forensic services market

15. Total forensic provision is estimated to cost the police service in the region of £400 million annually, amounting to 0.04% of police expenditure (central and local) in England and Wales.¹⁸ Within each police force, expenditure on forensic science is estimated to comprise approximately 20% of the force's scientific and technological spend. £210 million (or 52%) of police forensic spend is on services provided in-house by police forces—mainly fingerprinting and SOCOs.¹⁹

16. The remaining £190 million (or 48%) reflects expenditure on services provided by external suppliers of forensic services.²⁰ The major external providers are the FSS and the private companies, Forensic Alliance Ltd and LGC Ltd. There are a number of smaller companies engaged in analytical and testing work, particularly drug testing and document analysis, and a small percentage of services is provided by individual forensic practitioners (see figure 3). The FSS accounts for around 85% of the external forensic services market, but this market share has been declining.²¹ The main services provided by external organisations (as opposed to services offered in-house to the police) are forensic analysis and more specialised and labour intensive casework.

Figure 3: The market for forensic science in England and Wales (2004 estimates)



18 Ev 95

19 Ev 95

20 Ev 95

21 Ev 95

3 Changing Status of the FSS

Decision to move to PPP

Recent history of the FSS

17. The FSS became an Executive Agency of the Home Office in 1991. Prior to this, there was no charging mechanism for forensic services and services were, in effect, free at the point of use.²² In 1996 the FSS merged with the Metropolitan Police Forensic Science Laboratory and then in 1999 acquired Trading Fund status. These changes opened up the possibility of a market in forensic science services and, as noted by ACPO, “introduced financial discipline into forensic science provision and procurement” such that “Costs and value added by forensic support became clearer to police forces”.²³ During the 1990s the companies LGC and later Forensic Alliance started to penetrate the market. However, the FSS remained ACPO’s “preferred supplier” until 2002, with many forces opting to extend “what was effectively a ‘gentleman’s agreement’ with the FSS to provide services” despite the emergence of competitors and, until recently, formal contractual arrangements were the exception.²⁴

18. The Local Government Act 1999 required Police Authorities to obtain Best Value in local policing services. This obliged Authorities to challenge, consult, compare and compete when undertaking reviews of services. Clearly, this was not compatible with the historical approach of police forces to procurement of forensic services. This change in policy impacted directly on the FSS’s market share. In January 2003, following the new procurement requirements, a review of the Metropolitan Police Service procurement practices was carried out on behalf of the Mayor of London, the Metropolitan Police Authority and the Metropolitan Police Commissioner.²⁵ The review criticised the absence of a clear and accountable business relationship between the Metropolitan Police Service and the FSS and ultimately led to the Metropolitan Police purchasing services from all three major suppliers, rather than just the FSS. Many other forces have also adopted a mixed approach, purchasing a proportion of their services from the FSS and the remainder from the private sector suppliers, while Thames Valley Police now works exclusively with Forensic Alliance (whose main laboratory is sited within the Thames Valley force’s area).

McFarland Review

19. Against this background of the developing market in forensic science and the changing relationship between the police and the FSS, the McFarland Review of the FSS was announced in July 2002 by the then Home Office Minister of State for Policing, John

22 Ev 128

23 Ev 128

24 Ev 129

25 Accenture, Efficiency and Effectiveness Review Programme: Tranche 21 Forensics and DNA Review, May 2002

Denham MP. Robert McFarland reported his findings to the Home Secretary in July 2003.²⁶ The Review addressed three principal issues:

- The role that the FSS plays in the criminal justice system and, in particular, its contribution to meeting Home Office objectives;
- The need to deliver high quality, timely and cost-effective forensic science services that meet the needs of efficient police investigation and the criminal justice system; and
- The future organisational status of the FSS.

20. The Review stated that overall the FSS had been successful, was “on the whole well regarded by its stakeholders” and had “consistently met most of the operational and financial targets set by the Home Office”.²⁷ The Review stated that the FSS should “take particular credit for:

- Its response to the significant increases in demand for forensic services over the last decade;
- The development of the forensic applications of DNA, and the setting up and managing, with the Association of Chief Police Officers (ACPO), of the NDNAD; and
- Pioneering new ways of working with and in support of the police”.²⁸

21. The Review concluded, however, that “the emergence of a fully open and competitive market has been constrained by what the private sector saw as the entrenched monopoly of the FSS”, whilst “the FSS feels that its effectiveness is hampered by the way the Trading Fund framework operates”.²⁹ The Review attributed the increasing competition in provision of forensic science services predominantly to “the search by police authorities for ‘best value’” and noted that this had also “undermined the FSS position as ‘preferred supplier’”.³⁰

22. The Review considered, and ruled out, a number of organisational options for the FSS: abolition, strategic contracting out, market testing, and merger and rationalisation. The two remaining options, i.e. for the FSS to continue as a Trading Fund or to become a private sector classified company with the Government retaining a minority shareholding (a PPP), were then given further consideration. The Review noted that the FSS was “unique as a Trading Fund in having competition across the whole of its core business” and asserted that the “constraints under which the FSS operates as a Trading Fund place it at a significant disadvantage, leading to a high risk that the FSS could progressively decline”.³¹ The Review raised the possibility that “if the Government were prepared both to invest additional long-term capital, and to renegotiate aspects of the Framework Document to give the FSS further operating freedoms while remaining within the terms of the 1973

26 Home Office, *Review of the Forensic Science Service*, July 2003

27 As above.

28 As above.

29 As above.

30 As above.

31 As above.

Government Trading Fund Act”, the FSS, “at least in the short to medium term, should be able to continue to operate effectively”.³² The Review estimated that a one-off capital investment of £20 million to £30 million would be necessary to sustain Forensic Science Service business at current levels.³³

23. Nevertheless, the Review ultimately concluded that “the balance of the argument is strongly in favour of the PPP option”, asserting that “By becoming private sector classified the FSS would acquire the private sector flexibilities it desires, and the Government would be relieved of responsibility for a commercial operation, as well as partly realising its investment”.³⁴ The Review stated that the “risks from following the PPP route are not considered high, certainly when weighed against the potential benefits” and said that there was “every reason to believe that the FSS, its management and its staff would prosper” in these circumstances.³⁵

24. The Review therefore recommended that the FSS be transformed into a Government owned company (GovCo) as a precursor to evolution into a private sector classified PPP over 12–18 months. The GovCo phase would enable the agreement of a “contract between the embryonic PPP and the Government to ensure continuity of services, quality standards, and prices to public sector customers of forensic science services”, as well as the identification of an appropriate private sector partner.³⁶

Attitudes towards PPP

The need for change

25. Much of the evidence received in this inquiry, whilst praising the work of the FSS and its staff, has suggested that the FSS does need to make changes to the way it operates, in particular by increasing its customer focus and commercial competitiveness. The Biosciences Federation told us, for example, that the “FSS is currently not client or business orientated and turn-around times can be slow”.³⁷ This echoed the Committee of Public Accounts’ 2003 Report, *Improving service delivery: the Forensic Science Service*, which called the timeliness performance of the FSS “disappointing”.³⁸ ACPO agreed that the FSS had to “become more customer focussed” and told us that to date this transition had been “slow, resulting in work being lost”.³⁹ The Home Office viewed the problems faced by the FSS as even more serious:

“The Government acknowledges the scale of the challenge. The FSS needs to focus on meeting the demands posed by its core business in terms of enhanced service

32 As above.

33 As above.

34 As above.

35 As above.

36 As above.

37 Ev 137

38 House Of Commons Committee of Public Accounts, Fourth Report of Session 2003–04, *Improving service delivery: the Forensic Science Service*, HC 137

39 Ev 130

delivery and customer relations; keep pace with the proving and deployment of new scientific techniques; improve efficiency; re-balance charging structures and develop the commercial skills to fully utilise its key asset: a highly qualified workforce. Indeed, its present systemic weaknesses are such that it must begin making major improvements as soon as possible”.⁴⁰

The Home Office and the FSS were both of the view that the constraints imposed on the FSS by Trading Fund Status inhibited the ability of the FSS to meet these challenges. In particular, they asserted that there was a pressing need for contractual agreements with customers to be on a firm legal basis, and for the FSS to be able to access funding and carry out procurement exercises unencumbered by public sector restrictions.⁴¹

26. Prospect also acknowledged that the FSS was disadvantaged “by general Government constraints regarding the public sector borrowing requirement” and that there was “a need for investment in the Forensic Science Service”.⁴² However, along with other witnesses Prospect and PCS questioned whether development of the FSS as a PPP was the only solution to these problems.⁴³ The Royal Society of Edinburgh told us that “it should have been possible to introduce greater commercial awareness into the FSS within the existing structure and without conversion to PPP”, whilst Strathclyde University emphasised the need to “focus on behavioral (as opposed to structural) change”.^{44,45}

Responses to McFarland

27. The then Home Secretary’s acceptance of McFarland’s recommendations in July 2003 provoked a range of responses, including consternation on the part of many who feared that a PPP would have adverse consequences for the criminal justice system in the UK. Over the course of the ensuing 18 months, MPs repeatedly raised the issue in Parliament, challenging the wisdom of this course of action and urging the Government to resile from its decision to develop the FSS as a PPP.⁴⁶ Some of the most vehement opposition to the decision was presented by the trade unions representing the majority of FSS staff, Prospect and PCS, which launched a campaign against developing the FSS as a PPP under the strap-line, “Don’t Profit From Crime”.⁴⁷ A recent staff survey by the FSS indicated that 75% of the staff who responded had an unfavourable view of PPP.⁴⁸ The key concerns cited by those who have opposed the idea of developing the FSS as a PPP are summarised below in paragraphs 29 to 37 (see paragraph 126 for discussion of the likely consequences of PPP for expenditure on R&D).

40 Ev 99

41 As a Trading Fund the FSS cannot, for example, contract directly with the Home Office and other central Government customers.

42 Q 269, 271

43 Ev 124

44 Ev 136

45 Ev 103

46 e.g. HC Deb, 5 November 2003, col 259WH

47 www.pcs.org.uk

48 Ev 179

28. By contrast, others saw the move towards PPP as a logical progression: a competitive market for forensic services already exists and a PPP of the FSS should help to achieve a “levelling of the playing field between providers”.⁴⁹ Forensic Alliance pointed out that emergence of competition in provision of forensic services had already benefited the criminal justice system by, for example, “improving the timeliness of forensic services”, “expanding the national pool of forensic scientists” and “the breadth and depth of forensic science expertise”, and “stimulating innovative approaches and methodologies”.⁵⁰ In addition, ACPO told us that it would be “desirable” for the FSS to have “access to the same market freedoms that other competitors enjoy, if it is to be able to modernise, re-capitalise, and increase its speed of decision-making”.⁵¹

Principle that FSS should remain in public sector

29. Some of the hostility towards PPP stems from a fundamental belief that the nature of the work carried out by the FSS and its role in the criminal justice system mean that it should always be a public sector organisation. Helen Kenny, the Prospect FSS Branch Secretary, told us: “The objection that most staff have [...] is the objection to carrying out the work for profit. At the moment we carry it out as a public service”.⁵² This view was reinforced by Jeremy Gautrey from PCS: “The majority of our members object to the FSS being privatised because they do their work as public servants and they want to continue as public servants”.⁵³ Ian Parkinson, an employee of the FSS, further told us that PPP could undermine public confidence in the services provided by the FSS: “The FSS scientist, maintains the public sector ethos and as a public servant is clearly (and is understood in court) to be balanced and impartial”.⁵⁴ Conversely, Mr Parkinson believed that development of the FSS as a PPP would introduce “a risk to the perception of integrity and impartiality in court” since “privately employed scientists are perceived as more likely to represent a vested interest”.⁵⁵ The Home Office counter argument was that the current private sector involvement in forensic science means that the courts have already heard evidence from private sector scientists, although it could not provide us with any empirical data on public attitudes towards this change.⁵⁶

30. A further source of concern over the PPP of the FSS derives from the fact that the UK appears to be the only country that has proposed PPP as a desirable model for its forensic science service. Strathclyde University, for example, observed that “Although there are a number of countries with elements of private forensic science provision, such as the USA, no other country is contemplating the complete privatization of forensic science provision to its criminal justice system”.⁵⁷

49 Ev 118

50 Ev 117

51 Ev 130

52 Q 273

53 Q 273

54 Ev 148

55 Ev 149

56 Q 34

57 Ev 102

31. There is also unease over the loss of opportunities for Parliamentary oversight of the FSS under a scenario where the FSS becomes a PPP. PCS and Prospect commented that “As a PPP, the Government would be a minority shareholder and will not have a controlling influence. Neither will other stakeholders have any say in how the Company is run, unless they themselves become stakeholders”.⁵⁸

Implications for cost and range of services

32. Various witnesses were of the view that, as a PPP, the commercial pressures on the FSS may cause it to restrict the range of the services that it offered. ACPO pointed out that competition might cause providers to “reduce the availability of some of the more specialised and costly services, which are rarely used but vital when needed, or might decline to provide services in remote parts of the country”.⁵⁹ There is also a perception that developing the FSS as a PPP could lead to increased charges for both services and training. PCS and Prospect told us: “On low profit items (e.g. firearms) where there is only limited competition, prices to the customer (primarily police forces) will go up considerably [...] police forces may have no option but to reduce the amount of evidence sent for analysis”.⁶⁰ They also noted that “Free advice given over the phone prior to the submission of evidence would have to be charged for”.⁶¹

33. Prospect and PCS further commented that “In the financial year 2003–04 the FSS delivered over 450 courses to over 50 police forces/other bodies, training officers of all ranks” and suggested that, if the FSS became a PPP, the “External training given to customers, which is currently cost-neutral, would have a profit element introduced”.⁶² The latter view was endorsed by the Royal Society of Edinburgh, which told us: “It is important that commercial pressures at the FSS and the sensitive supplier-customer relationship do not have a negative effect on the role of the FSS in educating those concerned with the assurance of justice”.⁶³ We return to this point in paragraph 114.

Possibility of failure

34. The FSS occupies a unique position in the forensic services market. The FSS told us that its competitors “at present lack the infrastructure and critical mass to offer the total 24 hour, 365 day service which is singularly the hallmark of the FSS”.⁶⁴ ACPO, despite being broadly supportive of the plan to develop the FSS as a PPP, commented that a “destabilised and rapidly failing FSS, currently widely regarded as the leading forensic provider in the world, and with up to 90% of market share at present, is potentially a disaster, which we would prefer not to contemplate”.⁶⁵ In addition, Prospect and PCS were of the view that the Government could not afford to let the FSS fail: “The creation of a PPP will not transfer

58 Ev 124

59 Ev 129

60 Ev 122

61 Ev 122

62 Ev 122

63 Ev 136

64 Ev 154

65 Ev 129

risk to the private sector, because if the Company were to fail financially, the Government would be forced to step in for the benefit of the Criminal Justice System”.⁶⁶

35. Disquiet over the prospect of PPP has been intensified by the fact that neither the Government as a whole nor the Home Office has a good track record in managing large PPP projects. High-profile problems have arisen, for instance, in the PPP projects for the national air traffic control system and the new IT systems for the Child Support Agency and the Magistrates’ Courts (Libra project).^{67,68,69} Within the Home Office, there have been problems with the capacity of systems to carry out checks in the Criminal Records Bureau.⁷⁰ While not all of these projects are directly comparable to a public-private partnership for the FSS, **the Government’s poor track record at managing PPP projects does not inspire confidence in its ability to make a success of developing the FSS as a PPP.**

Fragmentation

36. It has been noted above that the interpretation of forensic evidence is highly context sensitive. Forensic Alliance told us that “Currently the most likely reason for forensic science to prove unreliable is when findings are interpreted out of context, usually when the scientist offering expert opinion is not in full possession of all relevant facts”.⁷¹ Forensic Alliance further noted that PPP could make this position “more complex if, as the forensic science market expands, scientific input is fragmented between suppliers”.⁷² Ian W. Parkinson, an employee of the FSS, also asserted that development of the FSS as a PPP would work “against disclosure of material in cases between suppliers”.⁷³ Prospect and PCS shared this view: “Information is not likely to be shared between Companies, and the consequence would be a loss of communication and a reduction in shared intelligence. Such liaison is crucial, as was highlighted in the M25 serial rapist case, when more than 100 scientists and support staff from five of the FSS’s laboratories were involved in carrying out work for six police forces”.⁷⁴ Furthermore, Prospect and PCS told us: “Competition developing at different rates in different fields means that a future Company may decide to sell one or more areas of its work, thereby splitting up the organisation and losing the valuable liaison that currently takes place within and between laboratories”.⁷⁵

66 Ev 124

67 House of Commons Committee of Public Accounts, Forty-eighth Report of Session 2002–03, *The Public-Private Partnership for National Air Traffic Services Ltd*, HC 80

68 House of Commons Work and Pensions Committee, Third Report of Session 2003–04, *Department for Work and Pensions Management of Information Technology Projects: Making IT Deliver for DWP Customers*, HC 1125

69 House of Commons Committee of Public Accounts, Forty-fourth Report of Session 2002–03, *New IT systems for Magistrates’ Courts: the Libra project*, HC 434

70 National Audit Office, *Criminal records Bureau: Delivering Safer Recruitment?*, 12 February 2004, HC 266

71 Ev 119

72 Ev 119

73 Ev 149

74 Ev 122

75 Ev 122

Security implications

37. An additional reason cited for scepticism over PPP related to security considerations. The trade unions Prospect and PCS remarked that “Currently the FSS security clears all staff to a minimum of Counter Terrorist Level as work is often highly sensitive including organised crime, terrorism and internal police investigations”, but “as a result of the PPP, the UK could be faced with the prospect of having non-governmental and non-security cleared staff processing some of the most sensitive criminal and intelligence information in the UK”.⁷⁶ Jeremy Gautrey from PCS also commented in oral evidence that, although “Currently, you could argue that there are people working in the private sector or forensic market that are not security cleared [...] a lot of people who work in the private sector companies have already been security cleared because they worked for the Forensic Science Service previously”.⁷⁷

GovCo

38. On 11 January 2005 the Home Office issued a further statement on the future status of the FSS.⁷⁸ The statement confirmed that the FSS would be transformed into a GovCo but, in an apparent departure from previous policy, made no explicit mention of PPP. Furthermore, the statement said that the Home Office would “use the interim period to fully test the merits of the FSS as a Government owned Company in its own right”.⁷⁹ Somewhat confusingly, the statement also said that the GovCo would be a “transitional structure”.⁸⁰ The public response reflected this confusion, with some people welcoming the change in the Government’s stance and others saying that they could see no evidence of a change in policy.

39. We sought to clarify whether progression to PPP was still inevitable or whether the FSS might stay as a GovCo indefinitely. In response to our question, the Home Office said: “The Government intends that FSS GovCo should be a success. It could remain as such in the longer term, but it is likely to need to be a transitional structure, in order to [have] access to private sector capital and skills through partnering in order to meet its full potential”.⁸¹ In oral evidence the Parliamentary Under-Secretary of State for Reducing Organised and International Crime, Police Science and Technology, Anti-Drugs Co-ordination and International and European Issues, Caroline Flint MP, confirmed that she was sceptical about the ability of an FSS GovCo to survive in the long term: “If the GovCo can deliver, then that is fine, but I still have doubts about particularly the injection of sufficient funding for it to develop and for it to innovate in the future”.⁸² This was in accordance with the earlier oral evidence of Steven Rimmer, a Home Office official, who,

76 Ev 124

77 Q 284

78 HC Deb, 11 January 2005, col 12WS

79 As above.

80 As above.

81 Ev 158

82 Q 532

when asked whether the assumption was that a GovCo would not provide everything that was needed for the FSS, had replied in the affirmative.⁸³

40. In view of the mixed messages contained within the Home Office statement of 11 January, we sought to elucidate whether or not it signified a change in Government policy on PPP. We were told by Tim Wilson, Head of the Home Office Science Policy Unit, that “There is no change of policy, but there is a distinctive change of pace”.⁸⁴ Mr Wilson went on to explain:

“Normally when the Government cedes the majority control of an entity, the government-owned company corporatised stage takes place a minute before midnight and a minute after midnight, it sells 51 per cent or so of its stake. What we are trying to do is expand that window of opportunity to work with the FSS to see how it can transform itself, running under a corporate structure, not an accounting officer’s structure, with people with the right kind of commercial discipline and experience in order to see what can be achieved from the revenue that the organisation itself can earn as it develops to face a competitive market”.⁸⁵

The expansion of the window of opportunity referred to by Mr Wilson is dramatic to say the least: instead of confining the GovCo stage to two minutes, the Home Office has promised to allow two years for testing the viability of GovCo status.

41. We believe that a decision to expand the duration of the GovCo phase from a matter of minutes to up to two years is a sufficiently drastic change of pace to constitute a change of policy. Furthermore, the statement of January 11 2005 which vowed to test the GovCo model for the PPP in its own right is not consistent with the original acceptance of the McFarland Review in July 2003, which invoked GovCo only as a precursor to PPP. The Government’s presentation of the decision has been misleading and confusing. At a time when the FSS and its staff have been seeking reassurance and clarity over the future of the organisation, the mixed messages being sent out by the Government are regrettable and damaging.

42. The Home Office had further stated in its announcement of 11 January that the timing of the next stage, i.e. following development of the FSS as a GovCo, would “depend upon reaching agreement with key stakeholders that conditions are favourable and the move would be advantageous to the business”.⁸⁶ We asked the Home Office who the key stakeholders referred to above were and whether development of the FSS as a PPP could occur without consensus between them. In response the Home Office told us that key stakeholders included the FSS, ACPO, Association of Police Authorities, and the trade unions representing FSS staff.⁸⁷ It also stated that “The views of all stakeholders will be taken into account when determining next steps, but the main focus will be on the interests of the business, the cost, development and availability of forensic science for the police and

83 Q 38

84 Q 540

85 Q 540

86 HC Deb, 11 January 2005, col 12WS

87 Ev 158

how to maximise its potential impact on the CJS in reducing crime”.⁸⁸ **The Home Office’s evidence clearly implies that, contrary to the impression given in its earlier statement, progression to PPP could indeed occur in the absence of agreement by all stakeholders that this is the best way to proceed. It is hard not to interpret the statement as an attempt to mollify those who opposed the PPP by using deliberate obfuscation.**

43. The Home Office told us that the target date for the FSS GovCo to come into being was 1 July 2005.⁸⁹ To enable this to happen, the Home Office and FSS will need to revoke the Forensic Science Trading Fund Order 1998, incorporate the new company and develop its constitution.⁹⁰ In particular, provision needs to be made for:

- Corporate governance;
- Staff transfer and pension arrangements;
- Business planning;
- Commercial strategy;
- Initial capitalisation, financing and performance targets; and
- Contractual arrangements for the FSS continued operational role in respect of the NDNAD.⁹¹

Tim Wilson admitted to us that it was “an ambitious target and not everything within the process is under the control of the FSS or the Home Office”, but highlighted the need “to move to a restructured FSS as quickly as possible”.⁹²

44. We fully recognise the importance of reducing uncertainty over the future of the FSS in as timely manner as possible. Indeed, the FSS had explicitly complained about the interregnum between the decision to move to PPP and the announcement of any further details, telling us that the major issue was not “the likely impact of transformation, but the need to bring this about as soon as possible, given that a freely competitive market is developing rapidly”.⁹³ We therefore asked the Home Office why there had been such a long delay between the acceptance of McFarland’s recommendations and the further statement in January 2005. The Minister told us: “having come into this in June, most of my discussions over the last six months have been about trying to establish for myself what the problems are and trying to make progress on discussions which have already happened, on work that had already been done on the outline business case in July of last year when the workshop was had with the trade unions on the outline business case, and I think some of those activities have just fallen into place in the last six months”.⁹⁴ **Other than the change in ministerial responsibilities, we have not heard any convincing reasons for the delay**

88 Ev 158

89 Ev 157

90 Ev 202

91 Ev 202

92 Q 541

93 Ev 154

94 Q 541

between the statement that the FSS would become a PPP and the announcement of further details on the plans to develop the FSS. This 18 month delay has been to the detriment of the FSS and its staff. It is also indicative of poor planning that, following this long delay, a very tight deadline was set for the FSS GovCo to come into being.

45. We asked the Home Office what specific criteria would be used to evaluate whether GovCo has been a success. In response the Home Office gave us a short list of “Typical measures for evaluating the success of a company of this type” and told us that it would be developing specific targets for the FSS over the next few months.⁹⁵ We also asked what criteria will be used to determine when or if the GovCo should be developed into a PPP. The Home Office responded in general terms again, telling us: “Any future move will be determined against comprehensive tests that take account of the possible benefits of private sector participation, likely changes in the forensic science market, benefits to business, realisable value to the government and access to private sector capital”.⁹⁶

46. It is worrying that the Government will have full responsibility both for designing the criteria by which the success of the FSS GovCo and the desirability of PPP will be assessed, and for making the assessment of whether those criteria have been met. Moreover, the Government, as sole shareholder, will have a significant influence over the management of the FSS through this transition; this in turn impacts on the chances of success at each stage. There is a pressing need for greater transparency and independent oversight of this process. We recommend that the Government make public the specific criteria that will be used for evaluating the success of GovCo and the need for progression to PPP. In addition, we recommend that the National Audit Office report on the Government’s management of the transformation of the FSS in order to provide some level of independent scrutiny of the process.

47. Very clear evidence would be needed to justify a transition from GovCo status to a PPP. It should not be assumed that a GovCo is merely a transition step leading to a PPP and, if the FSS is successful as a GovCo, it should remain as such.

Next steps

48. If the Government does decide to develop the FSS as a public-private partnership, it must put in place certain conditions to safeguard the quality, availability and cost of services provided by, and public confidence in, the FSS. Firstly, the Government needs to recognise that the choice of private sector partner is a matter of great significance. Some of the reservations expressed in evidence about PPP related to this. The Royal Society of Edinburgh remarked on the uncertainty surrounding who the FSS “partners will be, and what their long-term view for the service will be”.⁹⁷ The Home Office told us that no criteria had been drawn up regarding the exclusion of certain types of businesses as private sector partners, although the Minister did say in oral evidence: “We are not looking for people who come in, sort of venture capitalists, and take what they can and move out”.⁹⁸

95 Ev 203

96 Ev 159

97 Ev 135

98 Q 549

We hope that these conditions will be explicitly articulated at an early stage should a decision be made to pursue a PPP.

49. With regard to ensuring access to services for the police, the Home Office has told us that “In the transitional stage commitments will be placed on the FSS to provide services to forces as a supplier of last resort, but subject to value for money considerations and appropriate remuneration to reflect the costs of providing such services”.⁹⁹ However, the FSS GovCo would be free to set its own price structures: there will be no cap on the prices of core services, for example.¹⁰⁰ Relying on competition to keep services affordable carries risks and, should the FSS become a PPP, it is not clear that it will still be required to act as supplier of last resort. We asked the FSS whether it would be tempted to cherry pick the more profitable services once given the freedom to do so. Dave Werrett, the Chief Executive, denied that this would be the case: “I think one of our greatest strengths and indeed commercial advantages is that we tend to offer a one-stop-shop service” (although we note that there is no authoritative definition of this service and the core menu of services differs between suppliers).¹⁰¹ Nevertheless, the commercial pressures of an increasingly competitive marketplace may well cause an FSS PPP to review this policy: the costs associated with keeping rarely used and labour intensive services on the books may be hard to justify to shareholders. **If the FSS becomes a PPP, the Government must put in place measures to ensure that the criminal justice system has continued access to the full range of forensic services at an affordable price—whether provided by the FSS or another supplier. We recommend that this be done on a force by force basis through agreements between police forces and suppliers, within the framework of the police procurement strategy.**

50. Furthermore, we are mindful of the stressful impact that the uncertainty over the future of the FSS has had on staff there. The FSS is often cited as a “world leader” in forensic science and the skill and dedication of the FSS staff have undoubtedly been instrumental in building this reputation. We acknowledge the attempts made by the FSS management to understand better the views of their staff about the move to PPP by conducting surveys.¹⁰² **It is now up to both the Home Office and the FSS management team to take positive action to address the concerns expressed by staff over their own personal future at the FSS and their wider apprehensions about the future of the organisation.**

Market in forensic services

51. The McFarland Review noted that, since the FSS became an Agency in 1991, the market for forensic science services has grown in real terms by 10.5% a year, attributing this growth to:

- The increasing demands from the courts for independent evidence;
- New and improved technology, principally the development of DNA;

99 Ev 159

100 Q 48 and Q 543-544

101 Q 90

102 Ev 175

- The development of forensic science databases, principally the National DNA Database and the National Fingerprint Identification System; and
- The reduced effectiveness of other methods of securing convictions.¹⁰³

The Review team concluded that although growth would be less rapid over the next five years, annual volume growth should still reach around 8%.¹⁰⁴

52. The Home Office memorandum also stated that, although the “market for forensic science has grown rapidly in recent years due mainly to the increased use of DNA”, the “rate of market growth slowed significantly in 2003 and 2004” due to completion of the process of populating the National DNA Database.¹⁰⁵ ACPO expressed reservations about the future size of the market in forensic services: “Any development in the immediate future is likely to involve improving efficiency by rationalisation of services between forces, rather than outsourcing, thus restricting potential market opportunities for commercial providers”.¹⁰⁶ ACPO further noted that it was “unlikely, given our assumptions about public expenditure constraints, that police spending on forensic services will continue to grow at a significant rate in the future”, meaning that “The size of the market may therefore remain relatively stable, although the mechanisms within it, and the services we seek, will change”.¹⁰⁷ The development of lab-on-a-chip technology that would enable police officers to carry out certain forensic tests at the crime scene could also lead to an increase in the proportion of forensic science work carried out in-house by the police.

53. In the light of these potential limitations, the future commercial success of the FSS may depend on it penetrating markets in other countries. Equally, if there is an active global market in forensic services, there is no reason why foreign companies could not increase their UK market share. We were interested to know whether the Home Office foresaw any difficulties for the UK in this scenario. Mr Wilson, Head of the Home Office Science Policy Unit, noted that “The Government are signatories to the Government Purchasing Agreement which, under the World Trade Organisation’s rules, means that we cannot close up our gates to forensic science providers from any countries” and, furthermore, pointed out that “Much of the IPR [intellectual property rights used in the UK] is owned by US companies and there is US investment in the UK forensic science market already”.^{108,109} The Home Office also emphasised the importance of partnering with businesses who have local knowledge, and suggested that consideration be given “to whether business risks from such overseas ventures need to be ring-fenced to limit the FSS’s exposure in a way that such activities do not result in unacceptable risks to its UK forensic services and products”.¹¹⁰ The FSS said that it did provide some forensic services to other countries, e.g. by carrying out specialist testing and acting as expert witnesses.¹¹¹ The

103 Home Office, *Review of the Forensic Science Service*, July 2003

104 As above.

105 Ev 95

106 Ev 129

107 Ev 129

108 Q 560

109 Q 51

110 Ev 203

111 Ev 178

barriers experienced by the FSS in the global marketplace included the attempts by overseas judicial systems “to create their own abilities and retain funding within their system”.¹¹² The FSS also pointed out that “Many countries do not have the necessary understanding of the investment necessary to ensure Forensic Services can be supplied and therefore funding resources are not in place”.¹¹³

54. It is common knowledge that the existence of WTO rules does not guarantee free trade. In the case of forensic services, security restrictions in some countries may act as barriers to foreign companies seeking to enter their domestic market; some in the UK would argue that genuine security concerns make such restrictions not just legitimate but desirable. **The Home Office appears to view a future global market in forensic services, where the UK provides an increasing proportion of services to other countries and foreign companies have an ever more significant role in the UK, as a natural extension of the status quo. We have seen no evidence that this view is based on a thorough analysis of the long-term implications of this scenario, either in terms of the realistic opportunities for the FSS (and other UK based companies) to gain a significant foothold in overseas markets, or in terms of whether extensive foreign involvement in the provision of services to the UK criminal justice system could jeopardise security or affect public confidence. We recommend that it undertakes such an analysis.**

Regulation of the market

55. Much of the evidence received identified a need for a regulator to oversee the development of the forensic services market. At present, the Council for the Registration of Forensic Practitioners (CRFP) accredits individual forensic practitioners (see paragraph 132), while the UK Accreditation Service is recognised by the Government as the body for accreditation of all types of laboratories in conjunction with the two major standards: ISO/IEC 17025 and ISO 9000:2000. The arrangements for the National DNA Database are discussed in chapter four. The Forensic Science Society has only recently become a professional body and sees its role as providing “a coherent source of advice and knowledge to support the establishment of standards, working practices and policies that enable a more effective contribution to the criminal justice system from forensic science”.¹¹⁴

56. We heard a range of opinions about who the regulator should be and what powers they should have. LGC was concerned that “continuing with a ‘winner takes all’ approach to awarding long-term multi-force contracts could rapidly destroy the market” and said there was therefore “a clear role for an independent custodian to oversee the operation of the forensic market”.¹¹⁵ Forensic Alliance told us that “The whole question of laboratory accreditation for criminal justice purposes should be properly tackled, perhaps through an extension of the database Custodian function, or the appointment of a Forensic Regulator or, conceivably, through The Council for the Registration of Forensic Practitioners (CRFP)

112 Ev 178

113 Ev 178

114 Ev 157

115 Ev 127

which is already performing the vital analogous function of accrediting individual practitioners”.¹¹⁶

57. Other memoranda pointed out the potentially disruptive effects that the development of novel technologies could have on the forensic services market. ACPO told us: “The forensic field is one in which any major technological or scientific breakthrough, particularly if it involves miniaturisation or portability, could result in short-term gain, but long-term loss of commercial opportunities for providers”.¹¹⁷ ACPO gave the example of “hand-held devices based on ‘lab-on-a-chip’ technology, linked directly to forensic databases” that would allow the police forces “to move more forensic analytical processes back ‘in-house’, as the need for laboratory based services decreases”.¹¹⁸ LGC also commented on the “need to ensure that the introduction of new technologies and techniques does not destroy the market”.¹¹⁹ LGC raised the possibility that if “a single supplier either develops or purchases rights to a particular technique, service or database which then becomes essential to forensic service provision, and secures a monopoly in its use, it will effectively prevent police forces from using a supplier without access to that technique”.¹²⁰ It therefore advocated “a licensing system to be put in place, so that developers of new techniques can be appropriately rewarded for their innovation, but all suppliers can, on payment of an appropriate licensing fee and demonstration of competence, use the technique”.¹²¹

58. The Home Office acknowledged that, whilst they were satisfied that the three main suppliers all had “a strong emphasis on the quality of service provided to the CJS [...] further commercialisation of the forensic science market, especially with untested new entrants, could however change this position”.¹²² The Home Office has put forward a model for regulation that involves “the creation of a single quality assurance regulator (building on the experiences of the Custodian of the National DNA Database) accrediting suppliers who wish to provide services to the police and, by arrangement, other entities within the CJS”.¹²³ According to this model, “accreditation would be granted at the corporate level but the accreditation process would be based on appropriate quality standards applying to:

- The corporate body;
- The products and services provided; and
- The individuals responsible for the service”.¹²⁴

116 Ev 119

117 Ev 130-131

118 Ev 131

119 Ev 127

120 Ev 127

121 Ev 127

122 Ev 206

123 Ev 206

124 Ev 206

The standards set would be minimum standards and it would be up to police forces to demand higher standards in any particular area. We do not believe that the Home Office model for regulation based on the National DNA Database custodianship arrangements would provide for sufficient independent monitoring of the sector. We comment on the related but distinct issue of the custodianship arrangements for the National DNA Database in paragraph 76.

59. Historically, the FSS has also had responsibility for advising the Government on forensic science matters. This is no longer an appropriate arrangement in view of the changes taking place in the FSS and the forensic science market more generally. LGC, for example, noted that “the FSS’s traditional position as both scientific advisors to their parent department, the Home Office, and custodian of national forensic intelligence resources, such as the National DNA Database, mean that careful separation of the commercial and strategic (national interest) functions of the FSS will be vital”.¹²⁵ The FSS’s role in the custodianship of the NDNAD is discussed in chapter four.

60. The Runciman Royal Commission on Criminal Justice recommended as early as 1993 that a Forensic Science Advisory Council should be created to serve as the regulator for the forensic science community and an independent source of advice.¹²⁶ Strathclyde University told us that, providing it included representatives of all the relevant stakeholders, such a Council could be an effective mechanism for ensuring “scientific standards, integrity, and continuity of provision of forensic science to the criminal justice system”.¹²⁷ **At this time of transition in the forensic services market, the need for an independent regulator is becoming ever more critical. We recommend that the Government establish a Forensic Science Advisory Council to oversee the regulation of the forensic science market and provide independent and impartial advice on forensic science.** The Council should be an independent body but will need to include representatives of all the major stakeholders, such as the Home Office, the police, the FSS, Forensic Alliance and LGC, the Crown Prosecution Service, and the Bar. **The Council would also be ideally placed to review, or to commission inspections of, the use of forensic science across the whole of the criminal justice system, and to propose improvements where necessary.** The Council could additionally oversee the work of the Forensic Science Society and the Registration for the Council of Forensic Practitioners, which should also be able to put forward representatives to sit on the Council.

125 Ev 125

126 Royal Commission on Criminal Justice 151 (Cm. 2263), July 1993

127 Ev 105

4 National Databases

National DNA Database

History

61. The technology underlying DNA profiling (also known as DNA fingerprinting) was developed as a result of a serendipitous discovery by Professor Sir Alec Jeffreys and colleagues in the 1980s in the course of research into DNA variation and the evolution of families of genes.¹²⁸ The potential of the technology was soon realised: DNA was sufficiently stable and resilient to be extracted from samples of body fluids; the same DNA profile was found in all cells of an individual; and DNA profiles could be obtained that were effectively unique to an individual. The first use of DNA profiling for crime detection was in Leicestershire in 1986 during a rape and murder investigation that subsequently became known as the “Pitchfork Case” after the man eventually identified as the perpetrator, Colin Pitchfork. DNA evidence went on to be successfully used on a case-by-case basis in a number of investigations but the power of the technique was limited by the absence of a permanent collection of reference profiles to which samples obtained at the crime scene could be compared. The Home Affairs Select Committee was amongst those arguing, as early as 1989, for a DNA database analogous to the fingerprint database to be established, “Once a method of encoding DNA profiles has been established [and] provided that the expensive computer equipment [is] available”.¹²⁹

62. The National DNA Database of England and Wales was established in April 1995 under the aegis of the FSS. It represented the first national DNA intelligence database and remains the world’s largest. The DNA Expansion Programme launched in 2000 was hailed by the Prime Minister as “an acceleration in the high-tech drive against crime” that would lead, by 2004, to a database of “3 million suspect samples—virtually the entire criminally active population”.¹³⁰ In fact, the latest figures available show that the NDNAD now contains more than 2.7 million profiles and 243,627 crime scene stains.¹³¹ Since its establishment in 1995, there have been 584,539 suspect to scene matches and 38,417 scene to scene matches.¹³² In a typical month, matches are found linking suspects to 15 murders, 45 rapes and other sexual offences and 2,500 motor vehicle, property and drug crimes.¹³³ There is now a one in two chance that a suspect will be identified for an offence when a profile from DNA at a crime scene is added to the database.¹³⁴ Furthermore, the availability of a DNA profile improves the chances of a crime being solved. This is reflected in the fact that, for crimes where a DNA profile has been obtained, the rate of detection increases to 43% from the average detection rate of 24%. However, crime scene examination takes place

128 A.J. Jeffreys, V. Wilson, S.L. Thein, *Hypervariable minisatellite regions in human DNA*, *Nature*, 314(6006): 67-73, 1985

129 Home Affairs Committee, Session 1998–99, *The Forensic Science Service*, HC 26-I

130 HO Announcement 269/2000

131 *Hitting the mark*, *Jane’s Police Review*, 18 February 2005

132 *Hitting the mark*, *Jane’s Police Review*, 18 February 2005

133 Forensic Science Service factsheet on the National DNA Database, July 2004
http://www.forensic.gov.uk/forensic_t/inside/news/docs/NDNAD.doc

134 Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

following only 17% of all recorded crimes, and only 5% of crime scene examinations lead to DNA profiles being successfully loaded onto the database. This means that searchable DNA profiles are currently obtained from less than 1% of all recorded crimes.¹³⁵

Figure 4

What is a DNA profile?

A DNA profile is the pattern of DNA characteristics used to identify an individual. It can be visualised as a pattern of bands on a computer screen, as a graphic representation known as an electropherogram, or as a numeric code on the National DNA database.

A DNA profile is obtained by...

1. Extracting the DNA from a sample,
2. Measuring the amount of DNA obtained,
3. Producing multiple copies of specific areas of DNA of interest (these correspond to the “markers” referred to below),
4. Separating the resulting pieces of DNA by size, and
5. Analysing the pattern formed by the pieces of DNA.

The DNA profiles on the NDNAD were not all produced using the same method. Between 1995 and 1999, a method known as the Second Generation Multiplex (SGM) system was used. This looked at six different markers (areas of interest within the DNA) and tested for the gender of the individual. The probability that two unrelated people would have the same SGM profile is quoted by the FSS as being roughly 1 in 50 million. A chance match between DNA profiles from two individuals who are not identical twins is sometimes referred to as an “adventitious match”.

In 1999 the SGM Plus system was introduced. DNA profiles obtained using this method include the same six markers as used in SGM profiling, and the gender marker, but also include another four markers. The technique is more sensitive than SGM and allows a greater degree of discrimination between samples. The probability of a match between two full SGM Plus profiles from unrelated individuals is in the order of 1 in a billion. However, matches involving partial profiles or relatives are more likely to occur by chance, reducing the discriminatory power considerably.

22% of DNA profiles from criminal justice samples are SGM profiles and the remaining 78% are SGM Plus. DNA profiles obtained using the two different methods can still be compared because they have six markers in common.

Source: NDNAD Annual Report 2003–04 and FSS

Taking and retention of samples

63. There are, broadly speaking, three categories of samples taken for the purposes of obtaining DNA profiles to be loaded onto the database. The first category refers to samples taken from the crime scene—these are collected when police or SOCOs identify potential biological material that could be relevant to an investigation. Samples in the second category, usually called criminal justice samples, are taken from known individuals who are suspected of involvement in crime. The final category comprises samples taken from volunteers, usually obtained by police in the process of mass screening during a criminal investigation. DNA samples from individuals are generally taken as mouth swabs or pulled hairs. If the DNA profile obtained from crime scene sample matches a DNA profile on the database, this is known as an “intelligence match”. Until recently, the intelligence match was not sufficient for an offender to be charged, and is still not admissible as evidence for a prosecution. Instead, a second sample is taken from the suspect and the Crown

135 As above.

Prosecution Service (CPS) can only proceed with the prosecution if the DNA profile obtained from this also matches. This second match is often called the “evidential match”.

Criminal justice samples

64. The legislative framework for the taking and retention of samples for DNA profiling was provided originally by the Police and Criminal Evidence Act 1984 (PACE), which set out the circumstances under which suspect samples, known as “evidential samples”, could be taken for use in the investigation of an offence. PACE differentiated between intimate and non-intimate samples and permitted intimate samples to be taken only in connection with *serious* arrestable offences. Under PACE, samples obtained for DNA analysis were classified as intimate samples. The Criminal Justice and Public Order Act 1994 (CJPOA) provided the legal framework for the establishment of the NDNAD and reclassified saliva, swabs from the mouth, and hair with roots as non-intimate samples. Under CJPOA, non-intimate samples were allowed to be taken without consent from individuals charged with a recordable offence (or individuals who had been informed that they would be reported for such an offence).¹³⁶ In addition, CJPOA permitted DNA profiles from such samples to be compared with other recorded profiles in a so-called speculative search, with the proviso that the person must have been informed about why the sample was being taken, and about the fact that it could be used for speculative searching.

65. Under CJPOA, DNA samples and the profiles obtained from them could not be retained if the individual from whom they were derived was acquitted or not prosecuted. However, the 2000 HMIC thematic inspection report, *Under the Microscope*, noted that in the order of 50,000 samples and profiles had been improperly retained on the database.¹³⁷ In due course, the use of matches between newly taken samples and profiles improperly retained on the database for the purposes of intelligence was challenged in the courts. In the case of *R v B* the judge refused to admit the DNA evidence, and in the case of *R v Weir* the Court of Appeal quashed the conviction for murder, on the grounds that the DNA evidence (an intelligence match which led to the identification of the offender) should not have been admitted.¹³⁸ The House of Lords later ruled that it should be left to the discretion of the judge to decide whether to admit such evidence.¹³⁹ The Criminal Justice and Police Act 2001 (CJPA) addressed this problem by allowing the retention of samples and profiles from individuals who had not been prosecuted, or who had been acquitted, with retrospective effect to resolve the status of the samples that were then being improperly held on the database.

66. The powers awarded to police under PACE were further expanded by the Criminal Justice Act 2003, which allows DNA samples to be taken from any individual arrested for a recordable offence and detained in a police station. These samples may be retained irrespective of whether the person is cleared of the offence, or not prosecuted, providing

¹³⁶ Recordable offences are generally those offences that could lead to a custodial sentence and represent the majority of crimes investigated by the police.

¹³⁷ Home Office, *Under the Microscope*, Her Majesty’s Inspector David Blakey, July 2000

¹³⁸ *R v Weir* [2000] EWCA Crim 43 (26 May 2000): <http://www.bailii.org/ew/cases/EWCA/Crim/2000/43.html>. See also Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

¹³⁹ Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

that they are used for the purposes of prevention and detection of crime; the investigation of an offence; or the conduct of a prosecution.¹⁴⁰

67. The extension of police powers as described above has not been without controversy. The provisions under PACE relating to the retention of suspects who are not subsequently prosecuted or who are acquitted have been the subject of legal challenge. In the case of *R v Chief Constable of South Yorkshire ex parte S and Marper*, where an appeal was brought on the basis of the fact that retention of DNA samples under these circumstances was a breach of Articles 8 and 14 of the European Convention on Human Rights, the Court of Appeal ruled that the breach of Article 8 was proportionate and justifiable and found no breach of Article 14.¹⁴¹ This decision was subsequently upheld by the House of Lords.¹⁴²

68. During this inquiry we also heard reservations about the practice of retaining DNA profiles of suspects who are never charged with an offence, or found not guilty. Professor Sir Alec Jeffreys told us that he was “totally opposed to the extension of the database” in this way, regarding as “highly discriminatory” the fact that “you will be sampling excessively within ethnic communities, for example”.¹⁴³ GeneWatch UK were similarly critical of the retention of DNA profiles from this group of individuals, telling us: “we are concerned that the legislative changes to date have been introduced too rapidly and in the absence of any meaningful public debate [...] There are no data available to evaluate whether crime detection will be improved by including DNA profiles from people who are arrested and not charged, or by continuing to hold data on people whose charges are later dropped or are found innocent”.¹⁴⁴ GeneWatch called on the Home Office to bring the NDNAD policy closer into line with that used on the Police National Computer (PNC): “PNC records for serious violent and sexual offences are kept indefinitely, but most other records are eventually removed. On the PNC, records from people who have been acquitted may be retained only in some specific circumstances (mainly related to sexual offences) and for fixed time periods”.¹⁴⁵

69. The Home Office was vigorous in its defence of the practice of retaining the DNA profiles of suspects who are not ultimately convicted, citing the fact that from the approximately 175,000 DNA profiles that would have been removed without this provision, an estimated 7,005 profiles of individuals have been linked with crime scene stains involving 8,498 offences. These offences included 68 murders, 38 attempted murders, 116 rapes, 52 sexual offences, 78 aggravated burglaries and 80 offences for the supply of controlled drugs.¹⁴⁶ However, this argument could equally be used to justify the sampling of the entire population. Professor Sir Alec Jeffreys has indeed advocated such an approach on the grounds that this would be less discriminatory than current practice. This suggestion was dismissed by the Minister: “Because I think it is about being proportionate”,

140 Forensic Science Service, *The National DNA Database Annual Report 2003–04, 2004*

141 *R (S) v Chief Constable of the South Yorkshire Police, R (Marper) v Chief Constable of the South Yorkshire Police* [2002] 1 WLR 3223 CA, <http://www.bailii.org/ew/cases/EWCA/Civ/2002/1275.html>

142 *R (S) v Chief Constable of the South Yorkshire Police, R (Marper) v Chief Constable of the South Yorkshire Police* [2004] 1 WLR 2196 HL, <http://www.pubs1.tso.parliament.uk/pa/ld200304/ldjudgmt/jd040722/york-1.htm>

143 Q 399

144 Ev 142

145 Ev 142

146 Q 569

although she was keen to point out that she personally “would not mind” having her profile stored on the database.¹⁴⁷ **The arguments for the retention of DNA profiles of suspects who are not ultimately convicted in the interests of fighting crime need to be balanced against any potential infringement of civil liberties arising from this policy.**

70. Whilst this policy of retaining DNA profiles may have its critics, the retention of DNA *samples* represents an even bigger bone of contention. Samples are retained (linked to the record on the NDNAD via a barcode reference) by the laboratory which originally analysed them, although they remain police property. They are retained, in the first instance, to enable the profile to be checked and, in the second instance, in case a decision is taken to change the testing platform used for the database (see paragraph 86). The data that is entered into the NDNAD only carries information about a person’s identity and, to a small extent, ethnic origin. It does not provide information about a person’s medical history or physical characteristics. On the other hand, the sample from which the DNA profile on the database is derived does have the potential to reveal highly significant amounts of sensitive and personal information. In the words of Sir Alec, “If you have a DNA profile it is just a bunch of numbers on the computer and it really does not matter, but if you have the original DNA sample then you have the potential to extract absolutely every scrap of genetic information of that individual”.¹⁴⁸

71. GeneWatch argues that destroying samples once the initial checks have been carried out would not compromise current or future investigations since “All the information that is needed is stored in the DNA profile held on the computer database” and “Physical samples do not need to be retained to prevent errors because a fresh sample must be taken anyway before DNA evidence can be used in court”.¹⁴⁹ GeneWatch has therefore called for “an independent review of whose DNA profiles should be collected and retained on the NDNAD”, with “Research on the use of the NDNAD database, its effectiveness and the justification for including innocent people” conducted “to inform the debate”.¹⁵⁰ **DNA evidence now represents a vital instrument for facilitating investigations and securing convictions. We believe that the recent expansion of the database would make a review of the impact of the NDNAD on the detection and deterrence of crime timely.**

72. Professor Sir Alec Jeffreys has also called for “very strict legislation that would limit the police in what they could do with those samples that had been retained”.¹⁵¹ Current legislation requires that samples may only be used for purposes related to prevention and detection of crime, investigation of offences or conduct of a prosecution.¹⁵² As demonstrated by the fact that DNA samples taken for the purposes of obtaining DNA profiles have already been the subject of research projects (see paragraph 81), this definition is open to interpretation. **Independent research should be undertaken to assess the public attitude towards retention of DNA samples (both from convicted criminals and others), and the evidence of benefits associated with this practice.**

147 Q 570

148 Q 400

149 Ev 141

150 Ev 142

151 Q 400

152 Forensic Science Service, *The National DNA Database Annual Report 2003–04, 2004*

Voluntary elimination samples

73. A small proportion of DNA samples taken by the police are voluntary elimination samples. These are usually taken from known individuals who need to be eliminated as possible sources of crime scene samples, or in the course of mass screenings of a particular subgroup of the population from which the suspect is thought to come. It is noteworthy that SOCOs may not request samples from the victims of crime in all cases, thus a proportion of crime scene profiles on the database may actually be derived from victims, rather than perpetrators, of crime.

74. Approximately 75,000 police personnel have also submitted samples and the profiles derived from these are stored on the Police Elimination Database to facilitate the identification of instances of contamination of evidence.¹⁵³ Although the provision of samples was voluntary for existing staff, it has been made a condition of employment for staff who have joined the police since the Police Elimination Database was founded in 2000.¹⁵⁴ The Police Elimination Database is anonymised and, since it is not part of the main NDNAD, is not subjected to speculative searches. Suppliers to the NDNAD also maintain Staff Elimination Databases for analogous reasons.

75. The Criminal Justice and Police Act (Commencement No. 8) Order 2002 that came into force on 1 January 2003 amended the existing legislation to allow samples given voluntarily for the purposes of elimination to be retained indefinitely and used for speculative searches, providing written consent is obtained from the individual concerned. Importantly, once consent has been given it cannot be withdrawn. The NDNAD Annual Report 2003–04 explains that “The wider use now permitted will avoid the need for some individuals to be asked for further samples if they fall in the target population of other intelligence-led screens”.¹⁵⁵ The latter explanation does not address the reasons why an individual should be prevented from withdrawing consent at a later date, as is standard practice for the donation of tissue samples for the purposes of medical research. **We do not understand why consent should be irrevocable for individuals who are giving DNA samples on a voluntary basis.**

Custodianship arrangements

Background

76. When the NDNAD was first established, oversight and operation of the database was shared by ACPO and the FSS as joint chairs of the User Board. The User Board later became the National DNA Database Board, which had a more strategic role and was chaired by the ACPO portfolio holder for forensic science. The Board also included representatives from the police forces in England and Wales, the Association of Chief Police Officers in Scotland and the Home Office. The FSS was represented as both supplier and custodian of the database. With the emergence of a competitive market in forensic services, other organisations began to seek recognition as approved suppliers of DNA

153 Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

154 As above.

155 As above.

profiles. In 1997, therefore, the Chief Scientist of the FSS was allocated the role of custodian of the database and “Chinese walls” were constructed between the custodian and the FSS as a supplier, in order to prevent conflict of interests and safeguard the confidentiality of any sensitive information provided by other suppliers to the custodian. Dr Bob Bramley, the first and current custodian of the database, described his responsibilities as:

- Ensuring that all prospective suppliers could produce reliable, compatible DNA profiles for the Database;
- Recommending to the Board their approval as suppliers;
- On-going monitoring of their standard of performance on behalf of the Board;
- Efficient and effective provision of the Database services specified by the Board;
- Maintaining the integrity of the data held on the Database; and
- Ensuring the highest possible standards in the management of the Database.¹⁵⁶

In order to be recognised as an approved supplier, companies have to complete proficiency tests set by the custodian, be accredited by the UK Accreditation Service for their DNA work, and prove that they have adopted the internationally recognised quality assurance procedures for DNA analysis. All suppliers to the NDNAD are subject to various forms of on-going monitoring, such as blind and declared proficiency tests provided by the custodian. The custodian also chairs a Suppliers Group that could provide advice to the Board on scientific and technical standards and developments.¹⁵⁷

Problems with the custodianship arrangements

77. A number of people have expressed unease about the custodianship arrangements for the NDNAD. In its 2001 Report, *Human Genetic Databases: challenges and opportunities*, the House of Lords Science and Technology Committee noted the “clear potential for conflicts of interest” in the current arrangements and recommended “that the Government should establish an independent body, including lay membership, to oversee the workings of the National DNA Database, to put beyond doubt that individuals’ data are being properly used and protected”.¹⁵⁸ In addition, the 2002 Human Genetics Commission (HGC) report, *Inside Information: balancing interests in the use of personal genetic data*, stated that “at the very least, the Home Office and ACPO should establish an independent body, which would include lay membership, to have oversight over the work of the National DNA Database custodian and the profile suppliers”.¹⁵⁹ The HGC further recommended that a separate national ethical committee be set up to approve all research projects involving the use of DNA samples. The latter point is discussed in paragraph 81. In response to these recommendations, the NDNAD Board invited the HGC to nominate one of its Commissioners to sit on the Board “to advise on ethical issues and matters of

¹⁵⁶ Ev 192

¹⁵⁷ As above.

¹⁵⁸ HoL S&T Cttee, 4th Report Session 2000–01

¹⁵⁹ HGC, *Inside Information: Balancing interests in the use of personal genetic data*, DoH, 2002

wider public interest relating to the management and operation of the Database and the use of the DNA samples and data for research purposes”.¹⁶⁰ **Inviting a member of the Human Genetics Commission to sit on the NDNAD Board does not substitute for instigating proper arrangements for ethical and lay input. In failing to respond more positively to the calls for independent oversight of the database, the Home Office gave the impression that it was not a high priority.**

78. Not surprisingly, doubts have remained over whether the custodianship arrangements for the database are sufficiently independent and accountable. The memoranda submitted by LGC and Forensic Alliance to this inquiry both noted the need to make the custodian function fully independent of the FSS.¹⁶¹ Moreover, the McFarland Review acknowledged the concerns about the current arrangements and recommended that the NDNAD custodianship be removed from the FSS.¹⁶² The Home Office has accepted this recommendation and work is now underway to revise the custodianship of the NDNAD. These changes are discussed in paragraph 80.

79. The police have also commented on the need to ensure that changes to the custodianship of the database do not in any way restrict their ability to access data. ACPO told us: “Currently, there are signs that the FSS, and other providers, see the holding of such data [as is held in NDNAD] as a means of generating business opportunities. ACPO will resist this. We consider that the bulk of data derived from forensic testing on behalf of agencies in the Criminal Justice System should be regarded as public property, under the control of the public authorities. We cannot support a situation in which the police service has to pay for access to its own data”.¹⁶³ The Metropolitan Police Service similarly remarked that “it is critical to the future development of forensic science that this data is publicly held and securely available to all law enforcement agencies”.¹⁶⁴

Future custodianship arrangements

80. Dr Bramley, custodian of the NDNAD, explained that “The strategic goal, within 3 to 7 years, [...] is for independent governance and oversight of the National DNA Database wholly within the public sector, with Database operations and development run under competitive contract(s) and fully connected to the National Intelligence System”.¹⁶⁵ In the short term, Board meetings will continue to be chaired by the ACPO portfolio holder for forensic science; Board members will comprise representatives from the Home Office, ACPO and the Association of Police Authorities; and the lay representative nominated by the HGC and the custodian will be permanent invitees. In the long term, “it is envisaged that there will be physical separation of the National DNA Database from FSS premises and the FSS IT network, and co-location of the Home Office based Custodian group with the facilities for the provision of database operational services in new accommodation in

160 Forensic Science Service, *The National DNA Database Annual Report 2003–04, 2004*

161 Ev 116, Ev 125

162 Home Office, *Review of the Forensic Science Service, July 2003*

163 Ev 131

164 Ev 116

165 Ev 193

the Birmingham area”.¹⁶⁶ **We welcome the fact that the Home Office is to revise the custodianship arrangements for the NDNAD, and in particular the decision to remove the custodianship function from the FSS. However, we have not heard any firm commitment by the Home Office to establish an independent body with full ethical and lay input to oversee the workings of the database, in accordance with the recommendations of the Human Genetics Commission and others. Failure to do this at this juncture would be a wasted opportunity.**

Research

81. GeneWatch UK told us of its concern that “Research using the NDNAD can currently be conducted with the approval of the NDNAD Board, without any ethical oversight”.¹⁶⁷ In oral evidence to the Committee, Mr Wilson from the Home Office responded to this criticism: “The Human Genetics Commission are represented on the National DNA [Database] Board; they ensure that nothing is done as far as the database and the retained samples are concerned that would compromise ethical standards in research; they are our conscience”.¹⁶⁸ Dr Fereday, DNA Expansion Programme Manager at the Home Office, also commented that the Human Genetics Commission had visited the database and “were satisfied with the procedures”.¹⁶⁹ In addition, she told us that “a member of the Commission routinely attends and is able to comment and so far there have been no negative comments”.¹⁷⁰ However, the HGC told us in written evidence that it stood by its recommendations in *Inside Information* concerning the need for an independent body to oversee the work of the NDNAD custodian.¹⁷¹ Moreover, the HGC stated: “Currently, there is no ethics structure that properly assesses the research proposals which are submitted to the National DNA Database Board. The presence of an HGC member on the Board does not provide for adequate consideration on the ethical issues involved in research proposals”.¹⁷² This clearly contradicts the impression given to us by the Home Office. **We regret the Home Office’s misleading representation of the position of the Human Genetics Commission and its failure to take on board the Commission’s criticisms.**

166 Ev 194

167 Ev 141

168 Q 571

169 Q 575

170 Q 575

171 Ev 194-195

172 Ev 195

Table 1: Research requests to the NDNAD custodian

From	Received	Agreed
External research request from universities etc.	6	1
Police operational requests relating to specific investigations, including familial searching	4	2
Requests to assist forensic providers for R&D papers, for future use in cases not specific investigations	11	6
Database improvements	1	1

Source: Home Office¹⁷³

82. The HGC also raises the fact that, although few external applications have been submitted to the Board that would require the use of NDNAD samples, “requests to carry out internal development, for example to develop familial testing, are more frequent”.¹⁷⁴ In the past, research of this kind could be undertaken without ethical review and, whilst these proposals are now discussed by the board, “they are discussed in the absence of formal ethical oversight”.¹⁷⁵ According to GeneWatch, since 1995 the FSS has submitted five research proposals to the Board, two of which—both relating to identification of ethnic and familial traits—have been granted.¹⁷⁶ At no stage is there a requirement for consent to be given by the individual from whom the sample was taken. We understand that the NDNAD Board is now discussing with the Central Office for Research Ethics Committees the setting up of a protocol to obtain independent ethical opinion on future research and policy proposals.¹⁷⁷ **It is extremely regrettable that for most of time that the NDNAD has been in existence there has been no formal ethical review of applications to use the database and the associated samples for research purposes. The recent initiation of negotiations with the Central Office for Research Ethics Committees is too little too late.**

New applications

Familial testing

83. Familial searching, whereby a list is assembled of possible relatives of the owner of a particular DNA sample from the database, is now being promoted by the FSS to police forces to help identify those responsible for serious crime through their relatives.¹⁷⁸ The technique works by identifying an individual whose profile on the database shows a statistically significant similarity to a profile from a crime scene sample, but whose profile does not exactly match the crime scene profile and is therefore not the offender. There is a greatly increased probability of similarity between DNA profiles of individuals with a direct

173 Ev 213

174 Ev 195

175 Ev 195

176 Ev 141

177 Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

178 New Scientist, *Guilt by association*, Frederick Bieber and David Lazer, 23 October 2004

genetic relationship. The technique exploits this, relying on the fact that there is a high probability that a full match to the crime scene profile lies within the direct genetic relatives of the individual whose DNA profile on the database gave a partial match. In April 2004 Craig Harman became the first person to be convicted using evidence based on a link between DNA retrieved at the crime scene and the DNA profile of a relative of the accused. Employing familial searching for solving crimes can involve taking DNA from multiple relatives of the person on the database (ten or more would not be uncommon).

84. Familial searching carries with it ethical and human rights implications. Professor Sir Alec Jeffreys told us in oral evidence: “You are now using the database in addition for implicating relatives and I think that does raise some civil liberties issues”.¹⁷⁹ The recent report on the social, ethical and policy implications of the NDNAD, *Genetic Information & Crime Investigation*, highlights a number of potential difficulties with the technique:

“There are several fundamental problems. A genetic link between individuals might be previously unknown by one or both parties and police investigations may make such information known to them for the first time (and, as a by product, may reveal the absence of genetic links which participants assumed to have existed—estimates of the non-paternity rate in the UK vary between 5 and 20%). There is also the question of whether the use of an individual’s databased DNA in this way violates existing promises of privacy and confidentiality made when genetic material was originally collected. Furthermore, the implicit assumptions made about criminality and relatedness may also be problematic”.¹⁸⁰

We are concerned that the introduction of familial searching has occurred in the absence of any Parliamentary debate about the merits of the approach and its ethical implications.

Extraction of other information

85. The DNA profiles stored on the database are made up of a series of markers that correspond to non-coding regions of the genome. It is therefore commonly stated that no information about the physical characteristics or the health of the individual can be gleaned from the DNA profile. There is no indication that the ability to derive significant information about a person’s health or physical appearance from the DNA profiles currently used is imminent or even possible. Nevertheless, there are a few exceptions. *Genetic Information & Crime Investigation* noted the existence of “evidence that at least one currently used marker can be linked to a particular medical condition (type 1 diabetes)”.¹⁸¹ The authors point out that “If any of the loci [markers] currently used in forensic DNA profiling become established reference points for the diagnosis of further medical traits in the future, then it may be necessary for all stakeholders in the NDNAD to revisit their understandings of the adequacy of current arrangements for ensuring informational privacy”.¹⁸² In addition, the FSS already offers an ethnic inference service

179 Q 387

180 Williams, Johnson and Martin, *Genetic Information & Crime Investigation*, November 2004

181 Williams, Johnson and Martin, *Genetic Information & Crime Investigation*, November 2004

182 As above.

that can calculate the likelihood of an individual being of a particular race on the basis of the prevalence of certain genetic markers in different ethnic groups. Furthermore, the Police Science and Technology Strategy identifies “Use of DNA to predict physical characteristics” as a project required to meet more than one priority capability (although there is no suggestion that such information could be acquired from the DNA profile).¹⁸³ **Any future extension to the applications for which the data in the NDNAD can be used must be subject to public scrutiny.**

Platform technology

86. The police currently record 10 DNA markers per individual in order to generate a profile for the NDNAD. Professor Sir Alec Jeffreys asserted that this was insufficient, arguing that the number of markers collected should be raised to 15 or 16: “If you look, for example, at the Tsunami disaster, the identification there is done on the sixteen marker system and I would argue that the UK should be running at about that sort of number”.¹⁸⁴ Sir Alec explained his reasoning as follows:

“10 markers give a chance of a match between two unrelated people of, on average, 1 in 10,000,000,000,000. While this is extremely low, the current size of the DNA database coupled with very large numbers of speculative searches means that even extremely rare chance matches will arise. This possibility is admitted in the DNA database annual report [...] The chance of a fluke match will be increased in those people who carry common markers, to whom the 1 in 10,000,000,000,000 figure does not apply. It will also be increased substantially in close relatives; for example, siblings will have a roughly 1 in 250,000 chance of matching over 10 markers”.¹⁸⁵

The additional six markers (to the 10 already used) would, according to Sir Alec, “guarantee, with better than 99.9% certainty, that any false match would be detected in a given case”.¹⁸⁶

87. Professor Jeffreys told us in oral evidence that there would not be significant cost implications associated with collecting sixteen markers for each profile: “There are kits out there that will enable you to do a sixteen marker test with no extra time or very little cost implication compared to the ten marker test at the moment”.¹⁸⁷ On the other hand, he pointed out that changing the technology platform of the NDNAD would be less than straightforward: “The major problem is what we are going to do with the two and a half million databases that are primarily ten marker. Do we go back and re-test everybody and get them up to sixteen markers?”.¹⁸⁸

88. It has been argued that, since in the UK a conviction could not be based on DNA evidence alone, the NDNAD should be seen primarily as a screening tool. Dr Fereday used

183 Home Office, *Police Science and Technology Strategy 2004–09*, May 2004

184 Q 389

185 Ev 170

186 Ev 170

187 Q 391

188 Q 391

this latter point as justification for not increasing the number of markers utilised.¹⁸⁹ Dr Fereday's view neglects to take into account the fact that the same ten markers are employed for the "evidential match". Nimesh Jani, Policy Advisor at the CPS, also told us that, as a prosecutor, he would like to be able to work with DNA profiles that were essentially unique, which would argue for increasing the discriminatory power of a DNA match.¹⁹⁰ Sir Alec suggested that "it would be reasonable for the database to remain with 10 markers and for the additional 6 markers to be used, following the identification of a suspect, to verify or disprove the authenticity of the match".¹⁹¹ This would enable the discriminatory power of the DNA analysis to be improved without necessitating a logistically difficult and expensive change to the database technology platform. **We recognise that adventitious matches are extremely unlikely under the current regime. Nevertheless, we find Professor Sir Alec Jeffreys' warning that the "consequences of even one false match leading to a conviction that was subsequently overturned could be severe for the DNA database and its public acceptability" sufficiently persuasive to merit a thorough investigation of the benefits and risks of staying with the current 10 marker system and moving to, for argument's sake, a 16 marker system. We therefore recommend that the Government commission a cost-benefit analysis for this move.**

89. We also note that the new CPS guidance on DNA charging states that a suspect may now be charged on the basis of a DNA intelligence match, derived from the scene of the crime, and a sample of DNA kept on the NDNAD, providing there is some further supporting evidence.¹⁹² Moreover, whereas the previous ACPO guidance stated that where a DNA match was based on SGM to SGM profiles (i.e. on six markers only) it should be upgraded before charging, this may no longer be deemed necessary depending on the strength of other supporting evidence and what issues are raised by the defence.¹⁹³ We are concerned that such decisions may be being taken without proper scrutiny or adequate scientific input. Judge Thorpe, Resident Judge at Chichester Crown Court, additionally drew our attention to the need to review old cases where DNA profiles had been collected using methods with less discriminatory power. He told us that "Frankly, people on the FSS say, 'perhaps we ought to go and look at it but nobody has asked me and nobody is paying'. It is a matter of considerable concern".¹⁹⁴ We agree, not least in light of the alarming statistic in the NDNAD Annual Report 2003–04 that around 26% of matches between SGM criminal justice sample profiles and crime scene profiles were re-categorised as adventitious matches when the criminal justice sample was upgraded from SGM to SGM Plus.¹⁹⁵ **The Government should continue to make funding available to enable the upgrading of SGM profiles currently stored in the NDNAD to SGM Plus profiles. We further recommend that cases where DNA evidence has been used to convict someone who continues to protest their innocence should be kept live so that if another profile is added to the NDNAD that matches that used in the conviction of the individual, it will be spotted and acted upon.** We understand that the FSS will alert the police to instances

189 Q 579

190 Q 501

191 Ev 170

192 The Prosecution Team, *Guidance on DNA Charging*, 16 July 2004

193 Presentation by Karen Squibb-Williams, *Science and Criminal Justice Working Together*, 4 February 2005

194 Q 500

195 Forensic Science Service, *The National DNA Database Annual Report 2003–04*, 2004

where a newly added profile matches a profile that has already been used for a conviction. It is essential that the police then take appropriate action.

Other national databases

90. The police, understandably, are seeking to maximise the value of the data that they already hold. One means of doing this is through better use of, and greater connectivity between, the existing police databases. The National Intelligence Model is encouraging integration of intelligence sources, and the 2004 Bichard report into child protection, record keeping and information sharing in Humberside Police and Cambridgeshire Constabulary highlighted the need for better police intelligence handling.¹⁹⁶ Nevertheless, we heard in this inquiry that the police and Home Office were not giving the necessary attention to the custodianship arrangements for some of the other national forensic databases. Tom Palmer from Forensic Alliance, for instance, informed us of problems with access to the firearms database.¹⁹⁷ Despite this, the Home Office told us that it had “no immediate plans to alter the existing arrangements” for the firearms database.¹⁹⁸ Other key national databases include those that store information about footprints and drug analysis data. Forensic Alliance also highlighted the importance of sharing data between suppliers who are working on the same case, calling for guidelines to be drawn up “to ensure that as the market becomes more complex, common cause always prevails”.¹⁹⁹ **The police and the Home Office must ensure that they give adequate attention to the access and custodianship arrangements of other national forensic databases and put in place mechanisms for data sharing between suppliers where required.**

91. At the international level, there are also arguments for better harmonisation of national DNA databases to facilitate the fight against crime. The European Network of Forensic Science Institutes has been co-ordinating efforts to develop European DNA databases and there is a European Council Resolution that sets out the arrangements for the exchange of DNA profiles between countries in Europe in support of criminal investigations.²⁰⁰ The Interpol DNA Gateway also provides for the transfer of DNA profile information between two or more countries and for access to a limited international database containing DNA profiles that conform to Interpol standards.²⁰¹ James Watson, co-discoverer of the structure of DNA, has additionally called for a global database to aid the fight against crime and terrorism.²⁰² **Increasing the connectivity of different databases, whether at the national or international level, may have significant ethical implications. The Government must take this into account when considering the linking or cross-referencing of forensic databases.**

196 *The Bichard Inquiry Report*, HC 653, June 2004

197 Q 236

198 Ev 204

199 Ev 197

200 Council Resolution of 25 June 2001 on the exchange of DNA analysis results (2001/C 187/01)

201 www.interpol.int

202 Take everyone's DNA fingerprint, says pioneer, *The Independent*, 3 February 2003

5 Education and Training

University courses

92. The number of forensic science courses available at UK universities has increased dramatically over the last five or ten years. A search of the Universities and Colleges Admission Service website for “forensic” undergraduate courses produces a list of 401 degree courses at 57 universities.²⁰³ These range from “Forensic Science” through to “Forensic Science and Human Resource Management” (Keele University), “Citizenship Studies and Forensic Science” (London South Bank University) and “Football Technology and Forensic Computing” (Staffordshire University). Various witnesses told us that the expansion in provision of forensic science degrees “does not reflect the limited employment prospects in forensic science nor is it in response to employers in the sector”.²⁰⁴ Rather, we heard that the growth was a result of student interest in forensic science, which was, at least in part, stimulated by television dramas featuring forensic scientists and high profile coverage of forensic science in books and by the media.^{205,206} We are currently conducting an inquiry into strategic science provision in UK universities which will address the wider issues surrounding the action of market forces on science provision.

93. A recent report by SEMTA, the Sector Skills body for science, engineering, manufacturing and technology, on forensic science and higher education estimated that there are now approximately 3,000 forensic science undergraduates, which means that, in two years’ time, 1,500 people are expected to graduate with a Forensic Science BSc.²⁰⁷ This needs to be considered in the context of the evidence we heard that the already limited opportunities for people seeking employment in the forensic science sector were diminishing.²⁰⁸ The SEMTA report notes that Forensic Alliance received 500 applications for 30 posts, while Clive Wolfendale, Deputy Chief Constable of North Wales Police, told us that in a recent selection process they had 50 applicants for three volume crime scene examiner jobs.^{209,210} In a sector with very few employers these success rates reflect very restricted opportunities. Furthermore, Mr Wolfendale pointed out that “About half the individuals coming forward had BSc forensic science and for the three posts on offer we did not take any of them”.²¹¹

203 <http://www.ucas.ac.uk/>

204 Ev 104

205 SEMTA, *Forensic Science: Implications for Higher Education 2004*, 2004

206 *CSI shows give ‘unrealistic view’*, *BBC News*, 21 February 2005 and FOS 14

207 SEMTA, *Forensic Science: Implications for Higher Education 2004*, 2004

208 Ev 114

209 SEMTA, *Forensic Science: Implications for Higher Education 2004*, 2004

210 Q 293

211 Q 293

Table 2: Numbers of staff employed in the forensic science sector in the UK

<i>Employer</i>	<i>Number of employees</i>
Forensic Science Practitioners	3,430
<i>FSS</i>	<i>2,500</i>
<i>LGC</i>	<i>700</i>
<i>Forensic Alliance</i>	<i>140</i>
Police	990
Fire	190
Education	60
Total	4,680

Source: SEMTA, *Forensic Science: Implications for Higher Education 2004*, November 2004

94. Indeed, we heard extensive evidence that a large proportion of the forensic science courses on offer provide poor preparation for a career in forensic science. Clive Wolfendale called the majority of forensic science degree courses “a savage waste of young people’s time and parents’ money”.²¹² ACPO also commented in written evidence on the fact that “degree courses and other higher education opportunities are of widely differing standards and content, often hybrid in order to attract a wide range of students, often unsuited to the needs of employers, and sometimes encouraging unrealistic employment expectations among students”.²¹³ CRFP told us that “A forensic scientist first has to be a scientist” and asserted that there was “at present no qualification which, of itself, equips an individual for forensic practice”.²¹⁴ These observations are all in accordance with the finding of the SEMTA report on forensic science and higher education that “Both Forensic Science and other science employers consider a degree in Chemistry or some other pure science to be preferable to a degree in Forensic Science”.²¹⁵

95. We asked the Home Office whether they shared the concerns of the other witnesses about the quality of forensic science education. The Minister told us: “What worries me—and obviously we are not the lead department in this area—is if young people apply for courses and, at the end of the day, those courses do not equip them in what they expect to be their future career”.²¹⁶ In view of the Department for Education and Skills’ (DfES) responsibilities in this area, we asked the Home Office what discussions it had had with colleagues at the DfES regarding the quality of forensic science undergraduate courses. The Home Office response was as follows: “The Home Office has made no approach to colleagues, nor has that Department sought Home Office views on the quality of forensic science courses”.²¹⁷ **The two largest employers of forensic scientists in the UK are the**

212 Q 305

213 Ev 130

214 Ev 108

215 SEMTA, *Forensic Science: Implications for Higher Education 2004*, 2004

216 Q 591

217 Ev 204

police and the Forensic Science Service, responsibility for which falls within the remit of the Home Office. It is disappointing that, in view of the concerns expressed to us by the police and the wider forensic science community over standards in forensic science education, the Home Office has taken no action to communicate the existence of these problems to colleagues at DfES. We regret this lack of co-ordination between the Home Office and DfES.

96. Despite the criticisms levelled at the providers of forensic science higher education courses, there are many reputable courses on offer. The University of Central Lancashire, for example, told us that the employment rates for graduates of its forensic science course had been “excellent”.²¹⁸ Tracking of the University’s first graduating cohort of 98 students revealed that, of the 87% who replied, none was unemployed or not in full time study.²¹⁹ In addition, it needs to be recognised that there is a wide range of roles associated with the forensic science sector, all necessitating different skills and levels of education and training. A scientific background, preferably a chemistry (or other pure science) degree followed by a Masters, is essential for forensic scientists and researchers. For SOCOs, “Basic literacy and numeracy combined with good inter-personal skills are valued” by the police.²²⁰ According to the Metropolitan Police Service, “footwear and ballistics examination [...] require pattern recognition more akin to that of the fingerprint expert”.²²¹ Furthermore, for most forensic science roles, educational qualifications are just a starting point; on-the-job training and experience are ultimately essential.

Accreditation scheme

97. The Forensic Science Society told us that its increasing apprehension over “the huge growth in educational courses in forensic science” was behind the development of its accreditation programme for university forensic science courses.²²² To date, 24 universities are participating in this programme and the Society told us that it planned “to continue and expand this program in partnership with other organisations that have a common interest in setting standards such as other professional bodies and the sector skills organisations”.²²³ The University of Central Lancashire (UCLAN) was emphatic about the need for quality control of courses through an accreditation system, but more dubious about whether the Forensic Science Society’s scheme in its current incarnation could meet that need.²²⁴ The main criticisms of UCLAN related to the expense of the scheme, the fact that “it does not consider National Occupational Standards, despite these being enshrined in many courses”, and the concern that “the scheme is not robust enough to distinguish between those courses that are worthy of accreditation and those that offer Forensic Science education on the cheap”.²²⁵ **We trust that the Forensic Science Society will take**

218 Ev 190

219 Ev 190

220 Ev 199

221 Ev 115

222 Ev 157

223 Ev 157

224 Ev 190

225 Ev 191

on board the criticisms of major providers of forensic science courses in the further development of its accreditation scheme.

98. The success of the accreditation scheme requires not just the participation of the relevant universities but also buy-in from the main employers of forensic science graduates (see table 2). The two main employers, the police and the Forensic Science Service, have both expressed their support for the scheme. However, when we asked whether they would give preferential treatment to graduates of accredited courses when recruiting staff, they both said that they would not do this. ACPO told us that it had had no input into the Forensic Science Society's accreditation scheme, noting that "graduate qualifications are not sought in respect of most of the roles, e.g., crime scene examiner or fingerprint officer. [...] There are no plans, therefore, for ACPO to give preferential treatment to graduates of accredited courses".²²⁶ The FSS, which employs forensic scientists who are qualified to at least graduate level, told us: "The FSS criterion for recruiting scientists at trainee Reporting Officer level remains—a good science degree (chemistry, biochemistry, genetics etc). Any 'forensic science' qualification should be at Masters level. It follows that applicants from FS [Forensic Science] Society accredited courses would be unlikely to be given any preference".²²⁷ **Although we recognise the need for some kind of quality control system to be put in place, the fact that the two main employers in the forensic science sector will not give preferential treatment to graduates of accredited courses somewhat undermines the value of the Forensic Science Society's scheme. Furthermore, it sends out a confusing message to students and may give them the erroneous impression that opting for an accredited course will automatically increase their chances of subsequent employment in the sector.**

Implications for pure science

99. As noted above, employers of science graduates both within the forensic science sector and outside of it have expressed a preference for graduates of pure science degrees, in particular, chemistry graduates. Whilst forensic science higher education is undergoing rapid expansion, other branches of science have been experiencing a marked drop in popularity. There have been high profile closures of chemistry departments, e.g. at the University of Exeter, and other higher education institutions are ceasing to offer chemistry except in support of forensic science, e.g. Anglia Polytechnic University.²²⁸ Interestingly, the SEMTA report found that 44% of forensic science students would have studied another science subject if they had not been able to study forensic science, with biology and chemistry being the most popular choices.²²⁹ This tallies with the fact that 45% of the students surveyed cited an "interest in science" as the main reason for deciding to study forensic science.²³⁰ The SEMTA report also observes that women outnumber men on

226 Ev 199

227 Ev 177

228 *CSI fans force chemistry on to the back burner*, *The Daily Telegraph*, 1 December 2004

229 SEMTA, *Forensic Science: Implications for Higher Education 2004*, 2004

230 As above.

forensic sciences courses by a ratio of 2:1, making forensic science the most popular science-based degree course with women.²³¹

100. On the one hand, this could be interpreted as representing the siphoning off of potential students of chemistry and other pure science degrees into forensic science. On the other hand, it could be seen as offering a route to increase the attractiveness of science education, particularly for women, who are traditionally under-represented in the physical sciences. Professor Steve Haswell, Professor of Analytical Chemistry at the University of Hull, commented that “forensic science courses are tracking students into science at some level that perhaps would not have been there at all”.²³² Professor Sir Alec Jeffreys concurred, saying “kids are very excited about forensic science now for whatever reason and if we can use that to bring them into the basic sciences I think that is extremely valuable”.²³³ We agree. **There is an opportunity to harness the excitement surrounding forensic science to promote interest in science more generally. Academically rigorous and scientifically sound joint honours degrees in forensic science and chemistry, biology etc. could build on the appeal of forensic science while providing students with the analytical skills and scientific background required by employers. These degrees need to be developed in close collaboration with the main employers in order to ensure that graduates would be well qualified for the roles for which these organisations recruit.**

101. The University of Central Lancashire (UCLAN) also drew attention to the role that forensic science can play in supporting chemistry within higher education institutions: “In our case, although our chemistry department was closed in the 1990s, we have been able to retain research and education in chemistry within our department: without the Forensic Science course, this would not have been possible [...] Indeed, we have expanded chemistry provision to support forensic science, and are now able to re-open BSc (Hons) Chemistry in 2006/7”.²³⁴ Nevertheless, UCLAN described the demise of chemistry in higher education as “a grave national concern for large numbers of other employers [as well as those in the forensic science sector]”.²³⁵ **We recommend that the Forensic Science Society, SEMTA and the main employers work together with the Royal Society of Chemistry to promote an understanding of the value of chemistry as a route into forensic science. This could be done, for example, through visits into schools by practising forensic scientists.**

Training of forensic scientists

102. In the main, we did not hear criticism of the quantity or quality of training given to practising forensic scientists. However, there was some suggestion that LGC and Forensic Alliance tended to recruit trained scientists from the FSS rather than training them from scratch themselves. The FSS told us that “Until recently, the FSS was the sole source of trained forensic scientists in England and Wales” and noted that “Training costs can run to

231 As above.

232 Q 361

233 Q 363

234 Ev 190

235 Ev 190

£100k per individual”.²³⁶ Forensic Alliance refuted these allegations, saying that it was a “myth” that the FSS was “the only training ground for forensic scientists” and pointing out that it had “trained 25% of its staff from scratch and augmented the training of many others”.²³⁷ Forensic Alliance also told us that it now has “an advanced training facility running carefully structured courses covering all scientific aspects of forensic science, crime scene investigation and court work”.²³⁸

103. The popularity of forensic science means that most employers have plenty of applicants to choose from to fill their posts. Nevertheless, we received evidence of skills shortages in a few specialities. The Royal Society of Edinburgh commented that in the field of forensic psychology there was the “acute problem with the training and a shortage of supply of suitably qualified personnel”.²³⁹ In addition, ACPO told us of difficulties in accessing experts “who are up to date in the rapidly moving areas of digital forensics”.²⁴⁰ We also heard that Forensic Alliance and LGC recruit a small percentage of scientists from overseas (approximately 9% in the case of Forensic Alliance).²⁴¹ Forensic Alliance explained that this was “partly because there is a shortage of UK scientists but [...] also very much to enrich the scientific culture in this country because scientists coming from overseas bring with them a slightly different mix of skills and experience”.²⁴² Increasing competition in the forensic services market at both the national and international level could well increase the proportion of overseas scientists working in the UK. The Forensic Science Advisory Council could play a useful role in helping to standardise training for forensic scientists working in the UK. Introducing a requirement for CRFP registration for court-going scientists, as discussed in paragraph 139, should also help to ensure that scientists working in the UK criminal justice system have the necessary skills and experience, irrespective of where they trained originally.

Police training

104. Professor Jim Fraser, President of the Forensic Science Society and a former police Scientific Support Manager, told us in oral evidence that “The documented evidence in relation to police knowledge of forensic science, in terms of making the best use of forensic science, is consistently clear, that their knowledge needs to improve and therefore their training needs to improve”.²⁴³ He noted that “senior investigating officers in homicides and specialist elements of policing are usually much better trained” and said that the “real difficulty” was how to get an understanding of “the level of sophistication of some of the scientific techniques or the investigative value” at ground level in the average police force.²⁴⁴

236 Ev 155

237 Ev 198

238 Ev 120

239 Ev 136

240 Ev 201

241 Ev 198

242 Q 250

243 Q 169

244 Q 169

105. The documented evidence referred to by Professor Fraser includes the 2000 HMIC thematic inspection report, *Under the Microscope*, which identified the absence of a comprehensive training strategy within the police and highlighted a need for both awareness training amongst operational officers and better specialist training for forensic practitioners in the police service.²⁴⁵ HMIC set out overall guidance on the training of specialist and non-specialist staff in the report. The Public Accounts Committee also identified problems with police training in forensic science in its 2003 Report, *Improving service delivery: the Forensic Science Service*, commenting that whilst the FSS “contributes to national police training courses and provides training directly to individual forces as and when they request it [...] Only half of police forces undertook such training in 2001–02”.²⁴⁶

106. In response to *Under the Microscope*, the ACPO Forensic Science Training Working Group (part of the forensic science training portfolio) was set up and steps were taken to reduce the fragmentation of police training. ACPO told us that the service has also “responded to the need to keep patrol officers updated” and revised the material delivered to basic recruits.²⁴⁷ An interactive training package, known as “Think Forensic” has been developed for awareness training of officers outside the training period and this is in the process of being updated, under the leadership of the FSS. Despite this, ACPO acknowledged that much still needed to be done, warning us that “The scale of the problem should not be underestimated”.²⁴⁸ ACPO summarised the problem as follows: “With all the other training that police officers and staff need and the turnover we experience, we need novel and different means of raising awareness and increasing knowledge, which minimise time lost from front line policing duties”.²⁴⁹ This view was echoed by the Metropolitan Police Service who told us in written evidence that “The knowledge levels and awareness of all police and criminal justice personnel as a major enabler to the effective use of forensic science should not be underestimated. Raising awareness and ensuring that forensic science is used effectively is a critical part of building capacity in the MPS”.²⁵⁰

107. We welcome the actions taken by ACPO to improve police training in forensic science and urge it to continue, and enhance, these efforts in the future. Forensic science is not just a means of proving someone’s guilt or innocence. If used properly, forensic techniques can serve as vital intelligence tools to underpin the entire investigative process. Forensic science has a key role to play in enabling the intelligence-led approach to policing embodied by the National Intelligence Model. It is thus essential that police training in forensic science is delivered within the context of the National Intelligence Model. This should help to ensure that forensic awareness becomes embedded in the wider police force, rather than being confined to those in specialist roles or who have had specific training.

108. A further weakness identified by *Under the Microscope* and *Under the Microscope Refocused* was the “lack of full engagement amongst Chief Officers” in forensic science

245 Home Office, *Under the Microscope*, Her Majesty’s Inspector David Blakey, July 2000

246 Public Accounts Committee, *Improving service delivery: the Forensic Science Service*, 2003

247 Ev 200

248 Ev 200

249 Ev 200

250 Ev 115

issues.²⁵¹ ACPO told us that “the situation has improved significantly” since then with each ACPO Forensic Science Sub-Committee regional group now having an ACPO chair.²⁵² ACPO nevertheless acknowledged that there was no room for complacency and commented that “it has sometimes proved difficult to achieve the required level of ACPO involvement”.²⁵³ It is encouraging to see that progress has been made in identifying ACPO-level “champions” for forensic science. There is now a need to ensure that these officers are properly briefed and fully engaged. **We recommend that the Home Office, ACPO and the Association of Police Authorities ensure that regular seminars are held to keep those Chief Officers with responsibilities for forensic matters in a force up to date and active.**

Identification of best practice

109. Professor Jim Fraser, President of the Forensic Science Society told us in oral evidence: “There are a large number of police forces and [...] a lot of unexplained variation” in their use of forensic science, noting the fact that “There is no model for good practice”.²⁵⁴ *Under the Microscope Refocused*, a follow-up to the 2000 report, also observed that there was still a great deal of variation in performance of different forces.²⁵⁵ The report further highlighted the fact that “Many forces still have a great deal of difficulty in managing the process of turning identifications into detections and this is rooted in a paucity of quality performance information”.²⁵⁶ The Home Affairs Select Committee has also recently commented on the “unacceptable variation in the adoption of DNA technology by individual forces” and recommended that the Government review police use of DNA, with a view to addressing the growing problem of multiple identities associated with a single DNA profile on the NDNAD.²⁵⁷

110. We asked ACPO who had responsibility for the collation and dissemination of best practice in the use of forensic science by the police. ACPO described a “somewhat confused picture with agencies having overlapping responsibilities” and acknowledged the need for “Further rationalisation”.²⁵⁸ ACPO listed nine distinct organisations or committees with a role to play in this area: these are summarised in table 3. ACPO specifically identified the need to reduce overlap between the roles of HMIC, the Police Standards Unit, the National Centre for Policing Excellence and the National Policing Improvement Agency.²⁵⁹ **The multiplicity of organisations involved in identifying and disseminating good practice in forensic science to the police is unhelpful and wasteful. We support ACPO’s view that there is a need to rationalise the functions of these bodies and recommend that a single organisation be given overall responsibility for coordinating best practice in forensic science for the police. This should be done without**

251 Home Office, *Under the Microscope Refocused*, Her Majesty’s Inspector David Blakey, June 2002

252 Ev 200

253 Ev 200

254 Q 170

255 Home Office, *Under the Microscope Refocused*, Her Majesty’s Inspector David Blakey, June 2002

256 Home Office, *Under the Microscope Refocused*, Her Majesty’s Inspector David Blakey, June 2002

257 Home Affairs Select Committee, Fourth Report of Session 2004–05, *Police Reform*, HC 370-I

258 Ev 200

259 Ev 200

delay to prevent further duplication of effort and expenditure. This should additionally facilitate uptake of best practice by ensuring that there is one clear and consistent message conveyed to forces.

Table 3: Entities involved in identifying and disseminating best practice to the police

Entity	Role
Within ACPO	
ACPO Forensic Science Sub-Committee (FSSC)	Has authority on behalf of ACPO for ensuring that national guidance and policy is maintained. Encompasses various thematic portfolio groups and National Boards. Sponsors and maintains DNA Good Practice Guide in conjunction with NDNAD Board.
NDNAD Board	Chaired by ACPO Forensic Science portfolio holder. Has overall authority and responsibility for police practice and policy in relation to DNA matters. Issues policy directions and guidance in liaison with FSS.
National Fingerprint Board	Set up in 2003 under auspices of FSSC and chaired by ACPO. Has overall authority and responsibility for police practice and policy in relation to Fingerprint matters. Beginning to issue policy directions and guidance.
Crime Scene Management Board	Set up in 2004, chaired by ACPO. Has overall authority and responsibility for police practice and policy in relation to crime scene preservation and management.
Outside ACPO	
Centrex	Trading name for Central Police Development and Training Agency, formerly National Police Training. In liaison with above bodies has responsibility for overall design and accreditation of training to meet force requirements.
National Centre for Policing Excellence	Under auspices of Centrex has authority under Police Reform Act to issue Doctrine, Codes of Practice, and Guidance on policing matters. There are ongoing negotiations between the National Centre for Policing Excellence and FSSC over a project to produce a Physical Evidence Doctrine.
Police Standards Unit	Specific role to improve performance within the police service. FSSC has co-operated with the Police Standards Unit on several major projects mostly arising from the DNA Expansion Programme. Over the last two years the Unit has been working with Derbyshire Constabulary to produce and roll out a diagnostic tool for the improvement of forensic processes and timeliness using commercial simulation software.
Her Majesty's Inspectorate of Constabulary (HMIC)	Thematic, Baseline and Basic Command Unit inspection programmes ensure that forces are using forensic science effectively and applying the most up-to-date techniques and processes.
National Policing Improvement Agency	Expected that this newly-proposed Agency will take on responsibility for ensuring that nationally agreed good practice on certain policing issues is implemented in all forces.

Data source: ACPO

Implications of GovCo/PPP

111. More than 90% of police training in forensic science is provided in-house, with less than 5% being provided by the FSS and private sector suppliers, respectively.²⁶⁰ The majority of the in-house training is delivered through two national training centres: the Centrex facility at Harperley Hall, Durham, and the Crime Academy used by the Metropolitan Police Service.²⁶¹ Internal training is more likely to improve the ability of police to make the most of their in-house forensic services than external training and should therefore be more cost effective. Nonetheless, the small proportion of police training in forensic science provided by the FSS and other forensic suppliers is important since it (a) gives the police an opportunity to learn how to make best use of the external forensic services that they procure, and (b) injects external knowledge into police training, which is especially important for specialist areas that rely on external expertise. ACPO told us that they tended “to use forensic science providers on demand”.²⁶² We were pleased to hear that, for the most part, forensic science providers were “keen to provide training without too much emphasis on generating income”.²⁶³

112. We noted in paragraph 33 the concern that, if the FSS became a PPP, the external training currently given to customers on a cost-neutral basis would have a profit element introduced.²⁶⁴ The Royal Society of Edinburgh told us, for example, “If a significant commercial cost is involved in [the customer] training process, then bodies such as police authorities could be deterred from availing themselves of such services”.²⁶⁵

113. We asked the FSS what changes it would make to the availability and charging basis for training for the police and other customers once it became a GovCo. The FSS replied that its Customer Training and Development Unit had “undergone development over the last year and more changes are planned”.²⁶⁶ As a result, the number and range of forensic training courses and seminars available to police and other customers in the criminal justice system would increase. The charging scheme for customers would move from a block fee based on FSS staff costs to a charge per attendee with discounts for high users. The FSS told us that this would bring it “into line with other training organisations such as Centrex”.²⁶⁷ In addition, the FSS plans to “continue to provide some training at no charge and seek external funding from sources such as the Home Office to sponsor the production and supply of training packages and courses”.²⁶⁸

114. The present level of awareness training amongst police uniform and detective staff is insufficient and needs to be improved and increased, particularly with regard to how to properly protect crime scenes for examination. Any reduction in the availability or

260 Ev 200

261 Ev 200

262 Ev 200

263 Ev 200

264 Ev 122

265 Ev 136

266 Ev 176

267 Ev 176

268 Ev 176

comprehensiveness of training offered by the FSS would therefore be of concern. Training is also a resource-intensive activity for suppliers, taking skilled staff away from the bench. On the other hand, it is reasonable to assume that the increasingly competitive market in forensic services will incorporate a market in forensic training: spreading awareness of the possible use of forensic science should make good commercial sense. Furthermore, as noted above, there is a relatively small percentage of police training currently delivered by the FSS, and it is by no means clear that development of the FSS as a GovCo and potentially as a PPP will threaten the quality or affordability of customer training provided by the FSS (and its competitors). The proposed Forensic Science Advisory Council should be well placed to monitor the situation and advise of any need for intervention, should it arise.

115. The FSS also fulfils an advisory role to the police and, as illustrated by table 3, plays a part in drawing up guidance and best practice for them. Once the FSS is developed as a GovCo, this relationship may need to be reviewed. Indeed, ACPO told us: “The police service has hitherto relied upon the advice of the Chief Executive or Chief Scientist of the Forensic Science Service to provide advice as to the reliability of forensic techniques [...] when the FSS moves into private sector classification and operates in a competitive market, for commercial reasons it will no longer be appropriate to seek or receive advice in this way”.²⁶⁹ This, once again, emphasises the need for an independent regulator and source of advice. **The Forensic Science Advisory Council will be essential for ensuring that the police continue to have access to independent and impartial expert advice on forensic science in a competitive marketplace.**

6 Research and Development

Home Office and police R&D

Police Science and Technology Strategy

116. On 26 May 2004 the Home Office published the Police Science and Technology Strategy 2004–2009.²⁷⁰ The Strategy “deals with the application of technology and the physical sciences to policing in England and Wales” and “includes, but is not limited to, ICT, forensic science and technical equipment”.²⁷¹ The three core aims of the strategy are as follows:

- To establish priorities for current and future science and technology applications and research;
- To co-ordinate the development and implementation of technology between users and suppliers to ensure a coherent and effective process;
- To implement processes for future scanning to ensure that the police service can exploit new technology at the earliest opportunity and is prepared for new technology-based threats.²⁷²

117. The Police Science and Technology Strategy Group, which plays a key role in drawing up and implementing the Strategy, includes representatives from the Home Office, ACPO, Association of Police Authorities, FSS, Police IT Organisation, Home Office Police Scientific Development Branch and staff associations. It also has independent input from the Office of Science and Technology and the Royal Academy of Engineering.²⁷³

Forensic Integration Strategy

The Forensic Integration Strategy 2004–08 is the successor to the DNA Expansion Programme, which ran from 2000–04. It is comprised of a number of workstreams, including R&D, DNA, forensic medicine and integrated intelligence, the aim being to develop a more co-ordinated approach to the various different elements and activities associated with forensic science in the police. The strategic vision of the Forensic Integration Strategy is: “the optimal use of forensic science and technology to reduce crime, bring more offenders to justice and increase public confidence”.²⁷⁴ The Forensic Integration Strategy is being developed by the Police Science and Technology Strategy Group.

²⁷⁰ Home Office, *Police Science and Technology Strategy 2004–09*, May 2004

²⁷¹ As above.

²⁷² As above.

²⁷³ As above.

²⁷⁴ Ev 207

Police Technology Database

118. The Police Science and Technology Strategy Group is also in the process of establishing a Police Technology Database. This will contain “information about the science and technology initiatives being conducted by the 43 forces in England and Wales as well as data on crime and policing projects being carried out by the Home Office”.²⁷⁵ The database will be hosted by the Criminal Justice Extranet and will provide a central information resource for forces, with the aim of giving the police an insight into developments taking place across the service and reducing duplication. The project is currently in the data collection phase.

Funding for R&D

119. We were interested to know what funding the Home Office was providing for forensic science R&D. Mr Wilson, Head of the Home Office Science Policy Unit, said: “We have very modest amounts of investment going into forensic sciences but we do invest directly and about £500,000 a year has regularly gone to the FSS to support their R&D work [...] The Home Office more widely is engaged in a very broad range of scientific and technological research but clearly that is very much prioritised”.²⁷⁶ Police expenditure on R&D is also low. Only 0.01% of expenditure on science and technology by police forces is committed to R&D (compared with 57% on operational costs, 13% on deployment, and 30% on maintenance).²⁷⁷ If total expenditure on police S&T, including funding from the Home Office, is taken into account, the percentage rises to 1.3% spending on R&D.²⁷⁸ The Police Science and Technology Strategy 2004–2009 notes that “Although the figure of just over 1% spend on research and development appears to be rather low, it must be remembered that most police use of science and technology is of commercial ‘off the shelf’ equipment provided by industry”.²⁷⁹

Other sources of funding

120. We heard from various sources that it was difficult to find funding for forensic science R&D. The Forensic Science Society, for instance, complained that: “Forensic science as an interdisciplinary activity is not well served by the normal funding processes via the UK research councils”.²⁸⁰ Professor Sir Alec Jeffreys also pointed out the difficulty of finding funding for research in forensic applications: “My own research is funded by the Medical Research Council and it was made very clear to me that now that it had gone forensic it was a job for the Home Office and the MRC at that stage were no longer terribly interested in supporting it. [...] I think that is a culture that is somewhat alarming, that forensic science belongs to the Home Office and medical science belongs to the MRC”.²⁸¹ We have drawn attention to the problems faced by researchers working in interdisciplinary subject areas

275 Ev 204

276 Q 602

277 Home Office, *Police Science and Technology Strategy 2004–09*, May 2004

278 As above.

279 As above.

280 Ev 157

281 Q 382

and on applied research, as opposed to more blue skies research, in a number of recent Reports.²⁸²

EPSRC Think Crime Programme

121. One of the few sources of funding specifically targeted at research of relevance to the police and criminal justice system is the EPSRC “Think Crime” initiative.²⁸³ This programme, which provides funds for research on crime prevention and detection technologies, was praised by researchers and the Home Office alike, although the funding available is limited. In addition, Professor Steve Haswell, a Professor in Analytical Chemistry from the University of Hull and chair of the next EPSRC Think Crime Programme, drew attention to the fact that applications from researchers in biology and chemistry were poorly represented: of the 29 projects that have been funded under the EPSRC Think Crime programme, only four or five were in biology or chemistry; most of them were in the area of digital processing data and manipulation.²⁸⁴

Exploitation of research

122. Professor Haswell interpreted the low numbers of applications in biology and chemistry as a reflection of the lack of awareness by researchers in these fields of the relevance of their research to forensic applications. He told us: “the academic community out there—which is a formidable resource in terms of the UK being equipped to pull on that resource—are not guided well and they are not informed well of what the needs are”.²⁸⁵ We put Professor Haswell’s points to the Minister, who “noted the concern” and told us that communication between researchers and practitioners was “clearly fundamental to the future success of the FSS” and expressed her intention to tackle the issue when agreeing the capital structure for GovCo.²⁸⁶

123. Professor Haswell was also troubled by the UK’s weakness in exploiting research of relevance to forensic science. He told us: “When I look around at what people do in their research profiles you can always see tremendous opportunities to develop forensic support and forensic technology. That is simply not being tapped into. I think it is a kind of management problem more than a science based problem. It is just not being managed properly and exploited properly”.²⁸⁷ These sentiments are reminiscent of a *Nature* article in 2003 in which Ken Pease, a visiting criminology fellow at University College London, said that so many opportunities for exploitation of science for crime prevention were being missed that he “could walk into any laboratory and generate a crime-prevention application from their last few papers”.²⁸⁸ QinetiQ additionally commented on the “highly fragmented” approach to public sector procurement in the field of law enforcement and

282 e.g. House of Commons Science and Technology Committee, Eleventh Report of Session 2003–04, *Research Assessment Exercise: a re-assessment*, HC 586

283 <http://www.epsrc.ac.uk/ResearchFunding/Programmes/Cross-EPSRCActivities/CrimePreventionAndDetectionTechnologies/default.htm>

284 Q 368

285 Q 368

286 Ev 213

287 Q 369

288 Jim Giles, *Crime prevention: The lab arm of the law*, *Nature* 422: 13-14, 6 March 2003

the “reluctance of any one organisation to take the lead”, which together generate a “strong disincentive to companies and organisations with ground-breaking technologies to develop them into product”.²⁸⁹ **At this time of heightened security, it is unacceptable that so many opportunities to develop technologies that could assist in the battle against crime and terrorism are being squandered due to a lack of information for researchers and poor management of the research process. We recommend that the Home Office, Police Science and Technology Strategy Group and the Research Councils examine ways to resolve this.**

124. The Police Science and Technology Strategy provides a framework identifying areas of priority for R&D for crime prevention and detection and was developed in consultation with bodies such as the Royal Academy of Engineering. However, the evidence we have received suggests that there are poor channels of communication between the Police Science and Technology Strategy Group and the researchers who will play a key role in making the aims of the Strategy a reality. We asked the Home Office in writing what action it was taking, apart from having developed the Police Science and Technology Strategy, to accelerate the development of key forensic technologies. The only action cited by the Home Office was the Forensic Integration Strategy, which is actually a workstream of the Police Science and Technology Strategy.²⁹⁰ In oral evidence, the Home Office also pointed to its support for the EPSRC Think Crime initiative and said that the Science Policy Unit was beginning to have direct engagement with universities.²⁹¹ **The Home Office has published a high level Police Science and Technology Strategy and developed complex vehicles for its delivery. Yet it has singularly failed to engage with the scientists and engineers working in academia whose research is so essential for meeting the objectives identified in the Strategy.**

125. The police have expressed particular interest in “lab-on-a-chip” technology which could enable them to undertake DNA testing and other forensic analyses at the scene of the crime.²⁹² A recent policy seminar on Science and Crime heard that microfabrication combined with solid-state technology is enabling the miniaturisation of chemical analysis and researchers from the Open University have already produced a miniature automated analytical laboratory that was carried on board the Beagle 2 lander.²⁹³ We asked Professor Haswell what progress was being made by the UK in creating lab-on-a-chip technologies that could be used by the police. Professor Haswell’s response reflected his frustration: “It is painfully slow. We have taken quite an early lead in this I believe in this country and it has all slowed down, part of that is due to the very slow through-put through the research councils. It can take two years from an idea to funding, by the time you have gone through an outline and a full proposal. Fast-tracking has to be looked into; we need better focus; management has to be looked into”.²⁹⁴ It is disheartening for researchers who have helped to give the UK a competitive advantage in a particular technology to see their efforts going

289 Ev 145

290 Ev 202

291 Q 603

292 Ev 131

293 *Science & Crime*, Report of a seminar organised jointly by the Institute of Physics, the Royal Society of Chemistry, and the Institute of Biology, 10 June 2004

294 Q 423

to waste due to bureaucracy and a lack of vision. Current police and Home Office expenditure on R&D is very limited. **We recommend that the Home Office introduce fast-track grants for moving promising technologies from the proof-of-concept to the market-ready stage. In addition to funding, these grants should incorporate support to expedite the technology transfer process.**

Implications of GovCo/PPP

126. The FSS told us in its written memorandum that, in 2003–04, it invested 12% of turnover (£18 million) on development and business processes.²⁹⁵ However, the amount spent on scientific research was equivalent to only 2% of turnover (£2.6 million); the remaining 10% was spent on other product and service development activities, the DNA automation strategy and information services strategy development.²⁹⁶ Forensic Alliance, by comparison, invests approximately 3% of revenue on self-funded R&D.²⁹⁷ However, Prospect and PCS noted in their memorandum that whilst “FSS staff have authored or been co-authors of 84 scientific papers” between 2000 and 2004, which “have been cited a total of 300 times”, Forensic Alliance has in the same period “published only 6 scientific papers, only one of which has been cited and then only once”.²⁹⁸

127. There is no consensus on how PPP is likely to affect the amount or quality of R&D conducted by the FSS. Prospect and PCS trade unions told us: “As a trading fund the FSS has targets set with respect to investment in research and development [...] As a private sector company the FSS will no longer need to comply with these targets”.²⁹⁹ The Royal Society of Edinburgh was also of the view that R&D would be likely to suffer if the FSS became a PPP: “Investment in R&D by the FSS is likely to fall if more emphasis is put on purely commercial issues, and R&D can be a significant drain on the resources of a commercial enterprise in the short term. Any fall in R&D investment could be detrimental, but this may only come to light in 5 years or more”.³⁰⁰ However, the Home Office asserted that, as a result of Trading Fund status, the FSS “risks being left behind in the introduction and deployment of new technology”.³⁰¹ The Home Office also commented that “the nature of the procurement procedures which the FSS is obliged to follow” as a Trading Fund “not only cause delays in research projects but also expose in the process matters of a business confidential nature which the FSS would rather not disclose”.³⁰² **It is not possible to predict with any certainty the impact that development as GovCo and possibly as a PPP will have on the amount of R&D undertaken by the FSS. We are concerned that this impact could be negative. Should there be any significant fall in the percentage of R&D conducted by the FSS, the Government may need to introduce incentives to stimulate R&D in this sector.**

295 Ev 175

296 Ev 175

297 Ev 118

298 Ev 123

299 Ev 123

300 Ev 136

301 Ev 99

302 Ev 101

Intellectual property rights

128. ACPO suggested that “the police service has been slow to see the potential cost implications arising from the ownership of Intellectual Property Rights” and told us that there was “a strong argument for government to retain ownership of IPR currently owned, under government auspices, by the FSS, or at least make provision during the PPP process, for it to be freely available to Criminal Justice agencies”, despite the effect that this could have on the sale value of the FSS.³⁰³ When the majority of the Defence Evaluation and Research Agency was developed as a PPP, subsequently known as QinetiQ, most of the IPR generated within those parts of the Agency that were transferred to QinetiQ became QinetiQ’s property. However, the Ministry of Defence retains the right to use this IPR free of charge for defence purposes and a procedure was put in place that compels QinetiQ to seek clearance from the Ministry of Defence for any proposal that would entail exploitation of sensitive technology.³⁰⁴

129. The Home Office told us that at present IPR developed within the FSS is held by the Crown. In view of the decision to develop the FSS as a GovCo, the Home Office said that the FSS management, the police and police authorities would be consulted regarding the future IPR arrangements, the objective being “to ensure an appropriate balance between public policy objectives, VFM [value for money] for the Police and the successful development of GovCo”.³⁰⁵ **The IPR that has been developed within the FSS must remain freely available to the police once the FSS becomes a GovCo and potentially a PPP.**

303 Ev 131

304 HC Deb, 14 December 2004, col 1030W

305 Ev 158

7 Use of Forensic Evidence in Court

130. In recent years the spotlight has fallen on the use of expert evidence in court, triggered largely by the wrongful convictions of Sally Clark and Angela Cannings for murdering their babies. In both cases, Professor Sir Roy Meadow, a paediatrician of many years' experience, gave expert evidence at the original trials which included flawed statistical calculations. These cases were preceded by cases such as that of the "Birmingham Six", who were freed in 1991 having served 16 years in jail, after their convictions were overturned in part due to discredited forensic evidence. This inquiry has focussed predominantly on the use of forensic evidence by the criminal courts, although many of the points made are of relevance to the civil courts. We acknowledge that we are in danger of straying into areas beyond our remit in looking at the courts, so have sought to confine our comments to the use of science and expert evidence within the courtroom. Where we touch on more fundamental principles of the legal system this is primarily to provide the context for our observations about experts and expert evidence and is not intended to be a thorough analysis of those principles.

Expert witnesses

Role of experts

131. The purpose of expert evidence is to provide the court with information based on scientific results, the interpretation of which is outside the experience and knowledge of a judge and jury. It is the court's responsibility to decide whether there is a need for expert evidence and also to establish the competency of the expert witness. If the expert evidence is clear and not contradicted by any other evidence, the jury should accept it. If the evidence is not clear, or there is evidence which contradicts the expert's opinion, the jury may reject it. Furthermore, the judgement on Angela Canning's successful appeal against her conviction for murdering her two baby sons stated that "If the outcome of the trial depends exclusively, or almost exclusively, on a serious disagreement between distinguished and reputable experts, it will often be unwise, and therefore, unsafe to proceed".³⁰⁶

Council for the Registration of Forensic Practitioners

132. The Council for the Registration of Forensic Practitioners (CRFP) was established in 1999 to give the courts a single point of reference on the competence of forensic practitioners. The overriding aim of the CRFP is "to promote public confidence in forensic practice in the UK".³⁰⁷ It will achieve this through publication of a register of currently competent forensic practitioners; ensuring that registered practitioners stay up to date and maintain competence; and disciplining registered practitioners who do not meet the required standards.³⁰⁸ As of February 2005, there were 1,691 names on the register in up to

306 *R v Cannings* [2004] 1 WLR 2607, <http://www.bailii.org/ew/cases/EWCA/Crim/toc-C.html>

307 Ev 106

308 Ev 106

18 specialist areas ranging from anthropology to road transport investigation.³⁰⁹ The range of specialities available is currently being expanded to include veterinarians, fire scene examiners, geologists and specialists in digital evidence (computing and imaging).³¹⁰ It should be noted that not all of the practitioners registered with CRFP are expert witnesses; many are SOCOs, for example. However, we have focussed our discussion on issues pertaining to CRFP registrants who act as expert witnesses in the courts.

133. The standard for registration is “safe, competent practice”.³¹¹ Applicants wishing to join the Register are required to provide details of their qualifications and experience, references from colleagues and users of their services, and declarations about their past and future conduct. An assessor from the relevant specialty will also review a sample of their recent cases against competence criteria that have been developed in association with professional bodies. If successful, the applicant will be granted registration for four years. In order to renew their registration, the practitioner will need to “demonstrate that they have stayed up to date and maintained their competence” and their recent casework will be subjected to a further formal assessment.³¹² Where there is a need for disciplinary action against a practitioner, “The action taken will often be educational and remedial; but the ultimate sanction is removal of the practitioner’s name from the Register”.³¹³ Since the inception of the Register, disciplinary proceedings have been taken against two practitioners; these were still in progress at the time of publication of this Report.³¹⁴

134. The CFRP register has been welcomed by many as an important step towards a quality control system that ensures that those who present themselves as expert witnesses are competent to fulfil that role.³¹⁵ The Prime Minister has said: “Ensuring high standards of professional competence of those experts called to give evidence is crucial to the credibility of the judicial system and the Register is a tool that can do much to underpin that credibility”.³¹⁶ The FSS has demonstrated its support for the Register by requiring all its reporting officers (court-going scientists) to be registered, and ACPO policy is that police force forensic personnel should be CRFP accredited.³¹⁷

Limitations of the Register

135. Despite the widespread support for the CRFP, various people have identified problems and limitations with the Register as it stands. It has, for example, been asserted that now discredited expert witnesses, including perhaps Professor Meadow, would have had no difficulty in obtaining CRFP registration.³¹⁸ Indeed, Professor Meadow became discredited for the flawed statistical evidence that he gave—an area in which he was not

309 Ev 107-108 and memorandum from Alan Kershaw [not printed]

310 Ev 108

311 Ev 106

312 Ev 107

313 Ev 107

314 Q 221

315 e.g. Ev 166

316 Letter from the Prime Minister to Judge Anthony Thorpe [not printed]

317 Ev 100, Ev 131

318 *Experts in the Dock*, *New Law Journal*, 26 November 2004

expert; his speciality was in paediatrics. Andrew Keogh from Tuckers Solicitors recently criticised the fact that “there is nothing within CRFP that is committed to a remit of evidence-based practice”, and suggested that “it would be of more benefit to the criminal justice system if a comprehensive process of research, evaluation and peer review took place on a rolling basis”.³¹⁹ Karen Squibb-Williams, lawyer and Policy Adviser for the CPS, also expressed concerns about the CRFP. She told us that “registration cannot be a panacea for exercising a judge’s discretion” and called for “absolute independence and integrity in the auditing of that registration and validation of the accreditation that goes with it”.³²⁰ **The CRFP must itself be subject to regular independent auditing of the assessment processes used to grant accreditation and renewal of accreditation, as well as the disciplinary procedures. It is essential that the CRFP is, and is seen to be, transparent, accountable and independent. It must also be seen to exercise its duty of care by vigorous and appropriate actions in respect of malpractice allegations about registrants.**

136. Professor Sue Black, a CRFP-registered forensic anthropologist, also highlighted the limitations of the CRFP register for a small specialist community such as hers. She pointed out that the members of this community were all responsible for accrediting each other and that they had a vested interest in increasing the number of people in their field with CRFP registration since this would eventually bring more people into the discipline.³²¹ Equally, there could be a problem of competition between members of a specialism interfering with the peer review process that underpins accreditation. **As the community of registrants grows in an emerging specialism, the problems associated with the small number of possible assessors should diminish. In the meantime, CRFP must take care to monitor the assessment process carefully, if necessary using the services of overseas experts with appropriate experience and expertise.**

Voluntary/mandatory registration

137. At present, CRFP registration is voluntary for expert witnesses and the CRFP, Bar Council and Crown Prosecution Service (CPS) all indicated that they opposed the idea of mandatory registration. The CRFP, for example, stated in written evidence that “in a free society no one should seek to constrain the courts as to the evidence they can hear; and there will always be situations where evidence is required from an expert in a very small specialty or one whose expertise is needed in court too rarely to justify maintaining a registration scheme”. A requirement for an expert witness to have CRFP registration could also be problematic for cases where forensic practitioners based outside the UK are called to give expert evidence.

138. Professor Evelyn Ebsworth, Chairman of the CRFP, told us that he would be “very happy if all the organisations employing people to give evidence regularly in courts were to insist, as employers, that people should be registered”, and hoped that, as the Register expands, “courts will ask if [expert witnesses] are registered, and, if they are not, they will

319 *Experts in the Dock*, *New Law Journal*, 26 November 2004

320 Q 470

321 Q 407-408

ask why not”.³²² CRFP also told us that the Legal Services Commission, which must authorise the use of experts by solicitors in order to guarantee payment, was in the process of considering whether to use the CRFP Register “as an indicator, so that solicitors who use registered practitioners will have to provide less justification than those who do not”.³²³

139. Alan Kershaw, Chief Executive of the CRFP, estimated that, “in the mainstream specialities”, around 40% of the potential pool of practitioners have taken CRFP registration to date.³²⁴ **Providing that the current problems with the Register can be resolved, as the percentage of registered practitioners in the mainstream specialities increases, there will be a strong case for CRFP registration being made mandatory for experts in those specialities presenting evidence to the courts.** This would not prevent the courts from hearing evidence from an expert in a speciality for which CRFP had not achieved a critical mass of registrants, or from experts based overseas. **The Forensic Science Society should also consider making CRFP registration a condition of membership for active practitioners in order to stimulate uptake of accreditation.**

Presentation of evidence

140. During the course of this inquiry we heard much evidence to suggest that the weight ultimately attached to expert evidence by juries is determined in significant part by the way in which the evidence is presented. Professor Sir Alec Jeffreys told us in oral evidence: “I lost my faith in the adversarial system the first time I stood up in court”, due to the realisation that “it all depends on the chemistry between the witness and the jury”.³²⁵ In addition, following the successful appeal of Angela Cannings, Dr Chris Pamplin, editor of the UK Register of Expert Witnesses, asserted that “Roy Meadow did come to have that element of desirability in the eyes of the CPS” and warned that “Undoubtedly, there are some expert witnesses which when they stand up in court bring with them a very strong persuasive element to their evidence. And their evidence takes on a greater weight because of the way they deliver it”.³²⁶ It is worth noting that forensic science textbooks even advise experts to consider their manner of dress and appearance when giving expert testimony: a recently published book by the Royal Society of Chemistry observes that “it may be that the demeanour of the expert leaves as much of an impression on the jury as what was actually said. For these reasons an expert who is to appear in court must take particular care with such fundamental items as dress and appearance”.³²⁷

141. Professor Sue Black, a forensic anthropologist with considerable experience of appearing as an expert witness, identified a related problem: “when the defence ask who is the prosecution witness on this then frequently there are a number of people who will back down and will not go up in court against them”.³²⁸ She attributed this to the fact that “they

322 Q 175

323 Ev 110

324 Q 177

325 Q 416

326 BBC News, *Expert evidence under spotlight*, Tuesday 20 January 2004, <http://news.bbc.co.uk/1/low/uk/3412713.stm>

327 *Crime Scene to Court: The Essentials of Forensic Science*, Second Edition, Edited by P.C. White, the Royal Society of Chemistry, 2004

328 Q 416

believe that the person the prosecution has aimed for is going to have greater credibility, greater presence and greater ability in court” and described the “great scrambling in a lot of police forces to make sure that they get the person they want in the prosecution”.³²⁹ She herself said she had “first-hand experience of that, of being brought into a number of police forces to ensure that I was not brought in with the defence” and said that there was “unquestionably a league table among expert witnesses”.³³⁰ ACPO subsequently stated that they agreed with Professor Black’s observation, conceding that “some experts are perceived to have more credibility and are more persuasive than others”, although noting that the police preference for certain witnesses may also reflect their greater skill or experience.³³¹ Either way, this does not seem to be likely to advance the prospects of a fair trial.

142. We put these points to the CPS and received the following answer from Nimesh Jani, Policy Adviser and lawyer for the CPS: “That may be true of any evidence that juries will hear, and it is probably true whether it be the defence lawyer or the prosecution lawyer, if they have the charisma to entertain juries properly [...] At the end of the day, juries are there to judge the facts and that includes how people come across—inappropriately of course not, but appropriately yes”.³³² **We are disappointed to discover such widespread acknowledgement of the influence that the charisma of the expert can have over a jury’s response to their testimony, without proportional concomitant action to address this problem. If key players in the criminal justice system, including the police and experienced expert witnesses, do not have faith in a jury’s ability to distinguish between the strength of evidence and the personality of the expert witness presenting it, it is hard to see why anyone else should. There is clearly no easy answer to this problem, but that does not justify the complacent attitude of the CPS.** Possible steps that could be taken to ameliorate the situation are discussed in below.

Training of experts

143. In view of the emphasis placed on the importance of presentation of evidence, we were interested to know what training experts typically received in this area. Staff of the FSS and the other main providers are likely to receive training in the presentation of evidence to courts from their employer and the CPS drew our attention to the many seminars and courses provided by bodies such as the Expert Witness Institute. However, we heard that not all independent forensic practitioners, for example academics, were obtaining adequate training. Professor Black from the University of Dundee told us in oral evidence that “many of the professionals who are considered to be expert witnesses in court [...] frequently receive no instruction of what is required of them”. As a result, “they find the experience to be wholly unpleasant and feel that they have not presented in the way in which they had anticipated they would”.³³³

144. The report of the working group of the Royal College of Pathologists and the Royal College of Paediatrics and Child Health on sudden unexpected death in infancy also

329 Q 417

330 Q 418-419

331 Ev 201

332 Q 474

333 Q 406

commented on the detrimental effect of the lack of appropriate training for doctors appearing as expert witnesses: “Unfortunately, there is insufficient training emphasis on the necessity of a scientific foundation for expert testimony. Nor are doctors sufficiently trained in the differences between the [family and criminal] courts”.³³⁴ The report further recommended that “Doctors should have special instruction on the role of the expert witness before holding themselves out as court experts” and that “Such instruction should be renewed at least every five years”.³³⁵ In addition, the Bar Council said that training of expert witnesses would be “a welcome development” and asserted that a “government grant for training experts in presentational skills and the legal process would be justified in terms of the value it would give to the system”.³³⁶ **The training of expert witnesses in the general principles of presentation of evidence to courts and the legal process is essential. For independent forensic practitioners and those who would not otherwise receive such training, the Department for Constitutional Affairs should make funding available to ensure that they do have access to this training in advance of their appearance in court.**

145. A recent article in the *New Law Journal* pointed out that “there is no such thing as registered or approved witness preparation trainer, and no code of practice specifically on the topic”.³³⁷ This is important because there is a need to distinguish between legitimate witness training and prohibited witness “coaching”. The case of *R v Salisbury* (June 2004) established the legitimacy of training to familiarise witnesses with the general principles of giving evidence in court and how best to prepare for this experience. The training concerned was not tailored to the case in question, did not rehearse any possible lines of questioning, nor discuss any of the evidence relating to the case, all of which could have fallen into the realm of witness coaching. Nevertheless, this is a thorny subject, as reflected by the recent ruling in the Court of Appeal which stated that “training or coaching witnesses in criminal proceedings, whether for prosecution or defence, was not permitted”.³³⁸ In our view, in interpreting these rulings a distinction must also be made between ordinary witnesses and expert witnesses since the jury’s expectations of these two classes of witness are likely to be very different. The credibility of an expert witness may well be undermined if they appear confused or unsettled by the court process, irrespective of the strength of their expertise. **There is a need for clear guidelines to be issued setting out the acceptable areas of training for witnesses. These guidelines must also take into account the special status of expert witnesses, as distinct from ordinary witnesses. In addition, the guidelines should clearly differentiate between the roles of experts in the family, civil and criminal courts.**

334 The Royal College of Pathologists and The Royal College of Paediatrics and Child Health, *Sudden unexpected death in infancy: A multi-agency protocol for care and investigation*, September 2004

335 The Royal College of Pathologists and The Royal College of Paediatrics and Child Health, *Sudden unexpected death in infancy: A multi-agency protocol for care and investigation*, September 2004

336 Ev 168

337 Penny Cooper, *Witness preparation—staying within the rules*, *New Law Journal*, 26 November 2004

338 *R v Momodou, R v Limani* [2005] EWCA Crim 177, <http://www.bailii.org/ew/cases/EWCA/Crim/2005/177.html>

Adversarial system

146. The UK—like the US and most other Commonwealth—uses an adversarial system for trials. This is in contrast to the inquisitorial approach of civil law followed by many European countries. According to the UK common law tradition, witnesses are called by the prosecution or defence for the purposes of answering questions and are subsequently subjected to cross-examination by the other party. The judge does not call or examine witnesses: the role of the judge is to make decisions on points of law. In an adversarial system, expert witnesses, like ordinary witnesses, are called to provide evidence to strengthen the case of the relevant party. Opinions expressed by ordinary witnesses are not admissible by evidence: it is the responsibility of the judge, in civil cases, and the jury, in criminal cases, to draw inferences from the facts before the court. However, expert witnesses may assist the judge and jury in drawing these inferences and are therefore permitted to express their expert opinion.

147. It is clearly stated that the primary responsibility of the expert witness must be to the court. It is also clear that the expert must not present a biased opinion, the test for impartiality being whether the same expert opinion would have been given if the other party had commissioned the report. Nevertheless, there is a commonly held perception that expert witnesses are effectively “hired guns”. An anonymous survey of 133 expert witnesses conducted by the training firm Bond Solon in November 2002 revealed that 58% of expert witnesses did not think that lawyers encouraged their expert to be a “truly independent witness” and 53% of respondents said that there were firms of solicitors with whom they would never work again (although the reasons for this were not explored).³³⁹

148. The 2002 review of the investigation and prosecution arising from the murder of Damilola Taylor also highlighted the need to ensure that the defence does not “shop around” for an expert whose evidence is most favourable to their case, recommending that “there should be a general principle of reciprocity attaching to the duty of disclosure, including that the defence should be obliged to reveal to the prosecutor any expert evidence they have obtained, but which they do not propose to use”.³⁴⁰ The Criminal Justice Act 2003, section 35, is intended to address this by introducing a new obligation on the defence:

“If the accused instructs a person with a view to his providing any expert opinion for possible use as evidence at the trial of the accused, he must give to the court and the prosecutor a notice specifying the person’s name and address”.

This requirement will come into force in April 2005. The CPS is also running a “Disclosure Project” that aims to raise awareness of the importance of disclosure and the role of experts in this process.³⁴¹

339 Bond Solon Training, *Results of an anonymous survey of 133 expert witnesses conducted in November 2002*, 11 February 2003

340 *Review of the investigation and prosecution arising from the murder of Damilola Taylor*, December 2002, <http://www.met.police.uk/damilola/damilola.rtf>

341 Ev 173

Single joint experts

149. Chief Constable David Coleman, former holder of the ACPO forensic science portfolio, when asked what could be done to minimise the problems associated with the adversarial nature of the UK criminal justice system, commented: “I’m tempted to say change the adversarial nature of the process”.³⁴² David Coleman criticised the fact that the adversarial system “creates doubt and uncertainty in the mind of the jury when there is no need to do that”.³⁴³ One approach to this problem is the use of a single joint expert. Part 35 of the Civil Procedure Rules introduced in 1999 states that “Where two or more parties wish to submit expert evidence on a particular issue, the court may direct that the evidence on that issue is to be given by one expert only”. Single joint experts are not used for criminal cases in the UK.

150. The single joint expert has been increasingly used in civil cases but it seems to be accepted that the use of a single joint expert is not suitable for all cases. Criticisms levelled at the approach include the fact that there is decreased opportunity for informal discussion of issues between the lawyer and the expert; and the fact that parties often decide to appoint a shadow expert to assess the case as well (thereby negating the cost savings associated with having a single expert).³⁴⁴ Indeed, Mr Jani from the CPS indicated that if the defence did not agree with the expert appointed by the prosecution they may be entitled to have another appointed under the European Convention on Human Rights. Equally, the prosecution could seek their own experts if there were points of clarification required in the evidence of the expert appointed by the court.³⁴⁵ Judge Thorpe was also of the view that it was rarely possible to use a single expert.³⁴⁶ It has additionally been reported that some expert witnesses who have served as single joint experts in the civil courts have been reluctant to repeat the experience due to such factors as the increased workload and lack of a legal support team.³⁴⁷

Pre-trial meetings

151. Another practice from the civil courts that seems more likely to be adopted in the criminal courts is the use of pre-trial hearings to identify areas of agreement and disagreement between the experts for the prosecution and defence. These pleas and directions hearings do in fact happen already but Mr Jani from the CPS suggested that they were currently “not as effective as they should be” and Judge Thorpe said that his practice of holding a series of such hearings for serious cases was being criticised for “taking up court time”.³⁴⁸ According to the CPS, these constraints should be alleviated by the Criminal Case Management Framework and Criminal Procedure Rules 2005. Karen Squibb-Williams told us that “these reforms are designed to narrow the issues in each case and

342 Q 347

343 Q 347

344 Ian Walker, *The Single Joint Expert—A Leading Solicitor’s View*, The Expert Witness Institute Newsletter, Summer 2004

345 Q 478

346 Q 479

347 *Bias in expert witnesses*, Expert Witness Institute, 19 December 2003

348 Q 483

weed out some of the need to call experts at trial; both parties are expected to identify what elements of the Crown's case are: a. agreed/non-contentious (s9, CJA 1988); b. admitted (s10, CJA 1988), or; c. in issue".³⁴⁹ Significantly, pre-trial meetings seem to have almost unanimous support, with the Bar Council opining that "if experts speak to each other and compare notes, calculations and workings, or even perhaps run experiments together, then the area of dispute will be diminished; costs will be lowered, and perhaps only one expert will be necessary after all".³⁵⁰ We agree with this assessment.

152. Pre-trial meetings to identify areas of agreement and disagreement between experts must be held as a matter of routine; it is a false economy not to allow enough time for full discussion at this stage. We trust that the Criminal Case Management Framework and Criminal Procedure Rules 2005 will help to ensure that this happens in future but the Judicial Studies Board should ensure that its guidance emphasises the importance of this to the judiciary. Effective use of pre-trial meetings should reduce the potential for juries to become confused by unnecessary adversarial questioning. It should also avert the collapse of trials due to a known but previously undisclosed piece of evidence being put forward mid-trial that causes the expert on the other side to change their view.

Services for the defence

153. The CRFP posed the question in its memorandum: "Does the defence get as good a service as the prosecution?", telling us that this question was "central to the quality of justice".³⁵¹ In oral evidence, both the CRFP and the Forensic Science Society agreed that the defence now had, in theory at least, sufficient access to forensic services and experts. However, Professor Fraser, President of the Forensic Science Society, told us that the "fundamental barrier" to the defence getting as good a service as the prosecution was the "lack of knowledge of the importance or significance of the scientific evidence" and Professor Ebsworth, Chair of CRFP, pointed out that resources may still be a limitation.³⁵² The view of the Bar Council was that the defence "can get as good a service, but they sometimes have to push harder and overcome more bureaucratic hurdles".³⁵³

154. A forensic scientist appointed by the defence will usually not have any involvement in the case until much of the initial forensic analysis for the prosecution has been carried out. This means that the scientist for the defence will rarely see the evidence in its original condition. As Judge Thorpe said in oral evidence, "It is the Crown expert who has measured the marks on the road or looked at the child. The defence expert by and large is looking at work the Crown expert has done. He was not there, he did not see the child, he did not see the road himself".³⁵⁴ The defence scientist also often has to collate their report within a much shorter timeframe than the prosecution scientist. On the other hand, the defence scientist has access to all the results of forensic tests carried out by the prosecution, even if these results are not used in the prosecution scientist's report. It is perhaps worth

349 Ev 173

350 Ev 167

351 Ev 109

352 Q 198, Q 200

353 Ev 167

354 Q 448

noting here that the Bar Council experience is that “In practice there are often difficulties in obtaining the fullest disclosure of the note and workings of experts relied on by the prosecution, or access to their database, if any”.³⁵⁵

155. Historically, the defence did not have such ready access to, or make such extensive use of, forensic services as the prosecution (e.g. because material for forensic testing by the FSS had to be submitted through the police). The establishment of private sector providers and the changing status of the FSS have somewhat ameliorated that problem. Nonetheless, it is interesting that even now the proportion of FSS work comprising services for the defence is only 0.12%.³⁵⁶ Mr Cooke offered one explanation for this, saying: “I will not use an FSS expert when I am defending because I believe—whether I am right or not is not the point—there is a corporate spirit that will mean an expert from the FSS will not go against the party line”.³⁵⁷ Judge Thorpe suggested Mr Cooke was not alone in this belief: “as a judge I very rarely see an expert for the defence who is an FSS man. It may be that they all share Graham’s [Mr Cooke’s] view”.³⁵⁸ Alternatively, this phenomenon may have more to do with that fact that, as noted by ACPO, “whatever one expert says, it is usually possible to find another expert who will disagree and often present an equally plausible explanation for a particular piece of evidence”.³⁵⁹ As a result, the jury may find itself in the very difficult position of having to evaluate the two alternative scientific interpretations.

156. The Bar Council raised another potential obstacle to be negotiated by the defence: “The Legal Services Commission often requires counsel’s written advice before it will allow the necessary expenditure to instruct an expert for the defence [...] The fee often has to be agreed before it is known how much work will need doing and what the costs involved in presenting the case in court might be”.³⁶⁰ Andrew Keogh of Tuckers Solicitors also expressed regret in a recent article in the *New Law Journal* at the failure to implement Lord Justice Auld’s recommendation in his review of criminal courts that, where a judge thought an expert should be instructed, authorisation for funding should be automatic.³⁶¹ **We urge the Legal Services Commission to implement Lord Justice Auld’s recommendation to provide for automatic authorisation of funding where a judge is of the view that an expert should be instructed.**

157. It is also interesting to note that a recent survey by the legal publisher Sweet and Maxwell found that 85% of expert witnesses are paid under £200 per hour, with 32% of all expert witnesses, and 68% of forensic experts, receiving less than £99 per hour. These figures need to be interpreted with regard to the fact that 81% of those expert witnesses had more than 10 years’ experience of providing expert opinions to the courts, and roughly 25% had more than 20 years’ experience.³⁶² This suggests that there is little foundation for

355 Ev 167

356 Ev 178

357 Q 526

358 Q 527

359 Ev 201

360 Ev 167

361 Andrew Keogh, *Experts in the Dock*, *New Law Journal*, 26 November 2004

362 Tracey McCarthy, *Expert witnesses, misunderstood*, *New Law Journal*, 26 November 2004

the accusation occasionally levelled by some that expert witnesses routinely receive extortionate fees.³⁶³

Presentation of risk and probability

158. A particular area of difficulty in the interpretation of expert evidence by courts arises in the communication of risk and probability. The courts ultimately have to make a clear judgement about the case. By contrast, scientists can rarely give black and white answers and instead have to present a range of possibilities with, as far as possible, an indication of their relative probabilities. Professor Sir Alec Jeffreys expressed this as “a fundamental gulf between the philosophy of science and the philosophy of law”.³⁶⁴ If care is not exercised, the resulting tension can leave juries with a distorted understanding of the facts.

Presentation of DNA evidence

The prosecutor’s fallacy

159. A common pitfall in the treatment of DNA evidence has been the so-called prosecutor’s fallacy. It arises when the prosecution equates a statistical probability with the likelihood of guilt based on the statistical probability. For example, if the frequency of a particular DNA profile is one in a billion and there is a match between the DNA profile of the suspect and the DNA profile of a forensic sample from the crime scene, one way of presenting this would be: “the chance of obtaining this DNA profile if the DNA in the crime sample came from an individual other than the suspect is one in a billion”. However, this is sometimes—inaccurately—presented in terms such as the following: “there is only a one in a billion chance the suspect is innocent”. A more subtle, but equally misleading, variation would be: “the chance that the crime sample came from a person other than the suspect is one in a billion”. In statistical terms, it is known as the “fallacy of the transposed conditional”. It seems unreasonable to expect juries to recognise this trap, and experience has demonstrated that the fallacy can be overlooked by judges too.³⁶⁵

160. The judgement in *R v Doheny* and *R v Adams* (1996) is evidently designed to prevent scientists falling into this trap when presenting evidence to the court. It states:

“The scientist should not be asked his opinion on the likelihood that it was the defendant who left the crime stain, nor when giving evidence should he use terminology which may lead the jury to believe that he is expressing such an opinion”.

In addition, the Court laid down three principles regarding the role of the expert. Firstly, the scientist should adduce the evidence of the DNA comparisons together with his calculations of the random occurrence ration. Secondly, the Crown should serve upon the defence details as to how the calculations have been carried out which are sufficient for the

³⁶³ *The Express, Perils of Paying for Expert Evidence*, 2 February 2005

³⁶⁴ Q 415

³⁶⁵ For example, the judge in Sally Clark’s trial failed to recognise that Professor Sir Roy Meadow’s evidence had fallen into this trap.

defence to scrutinise the basis of the calculations. Thirdly, the FSS should make available to a defence expert, if requested, the database upon which the calculations have been based.

161. Current FSS policy is to quote a match probability in a statement along the lines of:

“If the DNA in the crime sample had come from some unknown person unrelated to the defendant, the probability of a match would be of the order 1 in X [the relevant figure]”.³⁶⁶

The concept of a match probability has drawn criticism from some on the grounds that there is still too much potential for misinterpretation by the jury. Judge Anthony Thorpe has been a member of a working group of judges, lawyers and scientists set up to advise on a more appropriate way of communicating DNA evidence to the courts. The group has agreed a provisional form of words and is now hoping that the Court of Appeal will rule, when a suitable case is before them, that scientists should address DNA in the following way:

“The probability that an unknown person, unrelated to the defendant, would have the same profile as the crime sample is 1 in X [the relevant figure]”.

This is also the wording favoured by Mr Cooke (who was part of the working group). In response to Mr Cooke’s allegation that the current form of words used by the CPS is potentially misleading, Mr Jani, on behalf of the CPS, has “suggested that the public be consulted in a scientific poll to assess the validity of this claim”.³⁶⁷

162. It is apparent that there is still a great deal of confusion regarding the best approaches for the presentation of statistical evidence to juries, even for DNA evidence which has now become a routine part of many criminal investigations. **We are of the view that there is significant room for improvement in the way that statistical evidence, including risks and probabilities, is presented to juries. In order for this to occur, there needs to be a better understanding of the forms of wording and presentation that are easiest to understand, and least misleading, to members of the general public. We do not make a judgement about which form of wording is most apposite for the presentation of DNA evidence but recommend that the decision be informed by research.** The training of judges and lawyers in the relevant areas of statistics, and of experts in the communication of this type of evidence, could also make an important contribution to improving the treatment of risk and probability in court, as discussed further in paragraphs 177-182.

Communication between scientists and legal profession

163. The resolution of the conflicts and uncertainties surrounding the presentation of statistical and scientific evidence would be greatly facilitated by the existence of effective mechanisms to encourage interchange between scientists and lawyers and judges. Indeed, channels of communication between forensic experts and the legal profession are essential to give early warning of the existence of such problems. It was therefore troubling to hear Graham Cooke, a barrister, complaining that feedback of scientists and experts to the

³⁶⁶ The Forensic Science Service, *Lawyers’ Guide to DNA*, Version 2, 2004

³⁶⁷ Ev 170

courts was “non-existent”.³⁶⁸ The Bar Council’s assertion that “there are frequent opportunities, in conference, at seminars, and at lectures for members of the Bar and the judiciary to meet with professionals in other fields” and observation that “experts are invited to dine with the judges at the Inns of Court” were somewhat feeble and provided little reassurance.³⁶⁹ The CPS noted that “the Office for Criminal Justice Reform has been extensively involved in discussions with the judiciary”, and we are, of course, aware of the *ad hoc* group led by Judge Thorpe to review the wording used to present DNA evidence.³⁷⁰ **The absence of formal and permanent channels for forensic scientists and experts to give feedback on their courtroom experiences seems to us to represent a serious flaw in the criminal justice system. We recommend that the Home Office establish a forum for Science and the Law, which meets at least every six months. If the recommendation to set up a Forensic Science Advisory Council is adopted, the forum should be subsumed into this body.** The Science and the Law Forum could play a vital role in drawing and disseminating lessons from the handling of scientific evidence in individual cases. It could also assist in considering how best to deal with evidence emerging from novel technologies (see paragraph 171 for further discussion).

Juries

164. It is not unreasonable to expect that juries may find it difficult to interpret the significance of some highly technical evidence. Yet jury research is currently prohibited in this country, making it difficult to assess conclusively the impact of complexity on juries. At present, section 8 of the Contempt of Court Act 1981 and the related common law assures the confidentiality of a jury’s deliberations and precludes research into these deliberations. Limited research is permitted regarding the processes of selecting, informing and supporting jurors during their service, but none has been published that pertains specifically to forensic, or other expert, evidence. Judge Thorpe commented in oral evidence that the status quo means that “The plain fact is that none of us knows why a jury comes to the decision it does, whether it is complexity or not”.³⁷¹

165. The Home Office has recently published the results of a research project addressing the attitudes of jurors who have recently completed jury service. The study looked at “jurors’ perceptions, understanding, confidence and satisfaction as a result of their service”.³⁷² The study found that most respondents had a more positive view of the jury trial system after completing their service than they had before. While the “main impediment to understanding proceedings was the use of legal terminology [...] jurors also felt that evidence could sometimes be presented more clearly”.³⁷³ However, the research did not address the impact of complexity, and Penny Darbyshire *et al* have also commented that “research which simply asks jurors, for instance, whether they understood instructions or evidence” is of “questionable value” since the fact that jurors claim to have understood

368 Q 499

369 Ev 169

370 Ev 174

371 Q 513

372 Home Office, *Jurors’ perceptions, understanding, confidence and satisfaction in the jury system: a study in six courts*, Roger Matthews, Lynn Hancock and Daniel Briggs, January 2004

373 As above.

something does not mean that they actually did understand it.³⁷⁴ Jury research is permitted in some other jurisdictions and mock trials have also been used for research purposes, although this approach obviously has its limitations too. Darbyshire *et al* produced a paper entitled, *What can the English Legal System Learn from Jury Research Published up to 2001*, which reviewed a large body of the evidence available from research both in the UK and elsewhere, as input to the Auld review.³⁷⁵ The paper cites various pieces of research relating to the credibility of expert witnesses. Amongst the findings noted are that jurors appear to evaluate credibility “by judging the status of the source combined with a subjective judgement of their knowledge and an assessment of their presentation”; and that, “when cross-examining expert witnesses, any questioning of that witness’s reputation instantly damages their credibility, even when the accusations are without foundation”.³⁷⁶

166. Further to a recommendation by the Home Affairs Select Committee that the Government should “consider the merits of repealing section 8 of the Contempt of Court Act 1981, in order to permit meaningful research into how the jury system operates”, the Secretary of State for Constitutional Affairs has launched a public consultation on whether the restrictions on jury research should be lifted.^{377,378} Both Judge Thorpe and Mr Cooke, a barrister, told us in oral evidence that they were wholly in favour of permitting jury research.³⁷⁹ It is also of note that the Royal Commission on Criminal Justice recommended in 1993 that section 8 be amended to allow properly authorised research into the way in which juries reach their verdicts. By contrast, Lord Justice Auld recommended in his 2001 review of the criminal courts that there be no amendment of section 8 to allow research into jurors’ deliberations.³⁸⁰ **Jury research is vital to understand how juries cope with highly complex forensic evidence. Jury research would also be instructive for understanding differences in the way that jurors respond to oral and written reports by experts, and how easy they find interpretation of these reports. We recommend that section 8 of the Contempt of Court Act be amended to permit research into jurors’ deliberations.**

167. The 1986 “Roskill Report” of the Fraud Trials Committee noted that the Committee was disadvantaged in its efforts to determine whether or not jurors could understand the technical evidence and complex issues in fraud trials by the fact that they were not allowed to discuss this topic with the jurors in such trials.³⁸¹ Nevertheless, the Roskill Report recommended that in serious fraud cases, jury trial be replaced by a Fraud Trials Tribunal, consisting of a judge and a small number of specially qualified lay members.³⁸² This recommendation was not adopted by the Government at that time, but Part 7 of 2003 Criminal Justice Act allows for trials on indictment without a jury on the application of the

374 *What Can the English Legal System Learn From Jury Research Published up to 2001?*, Penny Darbyshire, Andy Maughan and Angus Stewart, Kingston Law School, 2001

375 As above.

376 As above.

377 Home Affairs Committee Second Report of 2002–03: *Criminal Justice Bill*, HC 83

378 Department for Constitutional Affairs, *Jury Research and Impropriety*, Consultation paper CP 04/05, 21 January 2005

379 Q 513

380 Lord Justice Auld, *Review of the Criminal Courts*, October 2001

381 The Roskill Report, *Fraud Trials Committee Report*, London HMSO, 1986

382 As above.

prosecution in some fraud cases (Part 7 is not force yet). Jury trial is perceived by many to be a “hallowed democratic institution” that serves as the “best and fairest means available” of arriving at a judgement.^{383,384} However, there are already instances in which this principle is rightly departed from. **Advancements in science and technology impact on both the techniques used by criminals and the approaches employed in fighting and detecting crime. It is, therefore, highly likely that the number of cases which depend on complex forensic evidence will increase. This is already happening with regard to digital evidence. The Home Office should undertake research to test whether there would be value in extending the arrangements for complex fraud trials to be tried without a jury to other serious cases that rest on highly complex scientific evidence. This research must also address public attitudes towards this possibility.**

Scrutiny of expert evidence

Systems failure

168. The prosecution of Sally Clark for murdering her two babies partly relied on an assertion by an expert witness, Professor Sir Roy Meadow, that the probability of the two deaths having been incidences of cot death (also known as Sudden Infant Death Syndrome or Sudden Unexplained Death in Infancy) was 1 in 73 million. Aside from the fact that the calculation underlying this probability is incorrect, it has also been pointed out that this calculation was never compared with an estimate of the probability that the two deaths were the result of a double murder.³⁸⁵ Sir Roy was a paediatrician with no specific expertise in statistics and there were no other witnesses at the trial with qualifications in statistics. The court at Sally Clark’s first appeal refused to hear oral testimony from two statistical expert witnesses, on the grounds that it was “hardly rocket science”. The court ultimately concluded that “any error in the way in which statistical evidence was treated at trial was of minimal significance” and dismissed the first appeal.³⁸⁶ The second—successful—appeal revolved around medical evidence that had previously not been disclosed by the pathologist, although the court also thought that the misleading impact of the statistical evidence at Sally Clark’s first trial would in itself have been sufficient ground for declaring the conviction unsafe.³⁸⁷

169. Most informed observers seem to accept that Professor Sir Roy Meadow gave his evidence in good faith, no matter how erroneous it turned out to be. Yet he has been publicly vilified through the extensive media reports that focussed on his role in the miscarriages of justice in the Clark and Cannings cases.³⁸⁸ By contrast, little attention was given, at least in public, to the lawyers and judges involved, who may have been able to prevent the miscarriage of justice from being carried out, but failed to do so. In oral evidence to this inquiry, Professor Sir Alec Jeffreys expressed his amazement that the flaws

383 Lord Justice Auld’s review

384 Bar Council’s response to White Paper, para 23

385 Philip Dawid, *Statistics and the Law*, Research report No. 244, Department of Statistical Science, University College London, May 2004

386 *R v Clark* [2000] EWCA Crim 54 (2 October 2000), <http://www.bailii.org/ew/cases/EWCA/Crim/2000/54.html>

387 *R v Clark* [2003] EWCA Crim 1020 (11 April 2003), <http://www.bailii.org/ew/cases/EWCA/Crim/2003/991.html>

388 e.g. *The old boys’ club and its inexpert experts can still hold juries in thrall*, *The Times*, 13 January 2005

in Professor Sir Roy Meadow's statistical evidence were "not tracked right at the beginning", describing it as "a failure not only of the experts but also of the courts".³⁸⁹

170. The treatment of this case has had many wider ramifications, one of which is the increasing reluctance of experts to risk their reputations by appearing as expert witnesses. There is anecdotal evidence that it is now even more difficult to find experts for child protection cases. Additionally, the Royal College of Paediatrics and Child Health recently found that 29% of doctors who had been the subject of complaints about their work said that their willingness to work in child protection had been affected.³⁹⁰ This was not dependent on the outcome of the complaint, the vast majority of which were either dropped or not upheld following investigation.³⁹¹ **Expert witnesses have been penalised far more publicly than the judge or lawyers in cases where expert evidence has been called into question. These cases represent a systems failure. Focussing criticism on the expert has a detrimental effect on the willingness of other experts to serve as witnesses and detracts attention from the flaws in the court process and legal system which, if addressed, could help to prevent future miscarriages of justice.**

Admissibility of expert evidence

171. Establishing the validity of new scientific techniques or theories, and the basis for their interpretation, is essential before evidence derived from them can be used in court. It is not always straightforward for judges to decide whether to admit forensic evidence. It is worth noting, for example, in the last year the Court of Appeal has considered ear-print, lip-reading and facial mapping evidence in conjunction with criminal cases.³⁹² In addition, polygraphs, commonly known as "lie detectors", are currently used in criminal investigations in many countries including Belgium, Canada, Israel, Japan and the USA, despite evidence that the error rate of such tests can be significant.³⁹³ Future improvements in polygraphic techniques could prompt the courts in the UK to reconsider whether to admit evidence derived from these techniques.

172. Most states in the US follow well defined procedures to establish whether evidence from a particular scientific technique should be admitted. According to the *Frye* test (named after the defendant in a murder case in 1923), courts can only admit evidence derived from novel scientific techniques once the technique has gained general acceptance in the scientific community to which it belongs. The test entails first identifying the field in which the theory underlying the new technique falls, and then determining whether the principle of the technique is widely accepted by most members in this field.³⁹⁴ Most states now also apply the *Daubert* test to scientific or technical expert evidence.³⁹⁵ The *Daubert* principles require expert testimony to be tested against four criteria:

389 Q 422

390 The Royal College of Paediatrics and Child Health, *RCPH 's Survey on Child Protection*, March 2004

391 As above.

392 *The computer detectives*, *The Times*, 18 January 2005

393 The British Psychological Society, *A review of the current scientific status and fields of application of Polygraphic Deception Detection*, 6 October 2004

394 Congress of the United States Technology Assessment Office, *Genetic Witness: Forensic Uses of DNA Tests*, 1990

395 *Daubert v Merrell Dow Pharmaceuticals Inc* (1992) 509 US 579

- Whether the theory or technique can be (and has) been tested;
- Whether the theory or technique has been subjected to peer review and publications;
- In the case of a particular technique, what the known or potential rate of error is or has been; and
- Whether the evidence has gained widespread acceptance within the scientific community.³⁹⁶

Dr Chris Pamplin, editor of the UK Register of Expert Witnesses, has argued that “As a result of *Daubert*, expert evidence in the US is likely to come under close scrutiny at an earlier stage than in UK proceedings”, averring that “it is time for our courts to formulate similar rules. They might do better than the American model, but they could, at least, do no worse”.³⁹⁷

173. Professor Sir Alec Jeffreys also expressed his concern about the lack of established protocol in this country for deciding whether to admit scientific evidence.³⁹⁸ ACPO is similarly unhappy with the current situation: “To a large extent we are at the mercy of the criminal justice system as we have no agreed method of getting new techniques validated”, and refers to the US *Frye* and *Daubert* hearings as “an interesting development”.³⁹⁹ We are aware that dogged adherence to criteria such as those commonly used in the US could stymie the use of less mainstream, but nonetheless valid, expert evidence. However, the idea of an objective, clearly defined test to establish whether a theory or technique is sufficiently robust and evidence-based to merit admission in court is highly attractive. **The absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory. Judges are not well-placed to determine scientific validity without input from scientists. We recommend that one of the first tasks of the Forensic Science Advisory Council be to develop a “gate-keeping” test for expert evidence. This should be done in partnership with judges, scientists and other key players in the criminal justice system, and should build on the US *Daubert* test.** The development of such a test would complement the increasing emphasis on pre-trial hearings in England and Wales discussed in paragraph 151.

Early warning system

174. The legal profession seems to be largely content that the adversarial system in the UK offers adequate opportunities for the testing of expert evidence. The Bar Council, for instance, told us:

“scrutiny takes place because the adversarial system provides for the independent challenge of the prosecution view. This is an important safeguard. The second line of protection is the defence advocate who can be expected to prevent improper evidence or unsupported assertion. A third line is the judge who is expected to do the

396 Dr Chris Pamplin, *Taking experts out of the court*, *New Law Journal*, 26 November 2004

397 As above

398 Q 413

399 Ev 201

same. In our view these safeguards in practice have proved sufficient albeit no system is perfect”.⁴⁰⁰

The Home Office also asserted that the new Criminal Case Management Framework and Criminal Procedure Rules will help to “curb some of the extravagancies of the adversarial system”.⁴⁰¹ Staged reporting, as laid out in the *Prosecution Team DNA Guidance*, will also reduce the number of cases in which the expert is required to give full evidential statements and appear in court: the Crown will rely on an abbreviated statement from the forensic scientist where the contents are not in issue.⁴⁰² However, this is initially being restricted to cases involving DNA.

175. Despite these developments, the Metropolitan Police Service highlighted in its memorandum “the need for clarity in processes to deal with expert evidence that is called into question” and ACPO identified a “need for the Criminal Justice system to develop a consistent and clearly understood quality control and remedial process to cater for these eventualities”.⁴⁰³ Gary Pugh, Director of Forensic Services for the MPS, expanded on this in oral evidence, telling us there should be “an early warning system” to raise the alarm when expert evidence has been called to into question, for example by the expert’s peers.⁴⁰⁴ ACPO further explained that it “would welcome an open system where professionals within the investigative process and criminal justice process: Senior Investigating Officers, Prosecutors, Counsel and Judges, or even members of the public, can report concerns to some central point”.⁴⁰⁵ Provision would then need to be made for rapid validation of the concerns and, where necessary, disciplinary action against the expert and a review of their current and previous cases. ACPO suggested that the CRFP, in partnership with the law enforcement agencies and the legal professions, might be best placed to fulfil this role, but noted that this would be more effective if CRFP registration was mandatory.⁴⁰⁶ **The stance of the Bar Council, Home Office and CPS that the adversarial system provides sufficient safeguards so as to obviate the need for independent scrutiny of expert evidence is complacent and at odds with the views of the police.** We accept that the criminal justice reforms that are being introduced may offer some improvements to the status quo in due course, although it seems that much will still be left to the discretion of the judge.

176. We recognise that the number of miscarriages of justice associated with flawed expert evidence is unlikely to be high, and the legal system as it stands should enable miscarriages in serious cases to come to light eventually. Nevertheless, there is no way of knowing the actual number of cases that have been adversely affected by problems with expert testimony or its interpretation, particularly more minor cases which are unlikely to have been the subject of an appeal. **Even if problems are rare, the human cost and damage to public confidence in the criminal justice system caused by the miscarriages of justice**

400 Ev 168

401 Q 615 [Mr Wilson]

402 Ev 205

403 Ev 113, Ev 125

404 Q 346

405 Ev 201

406 Ev 201

associated with flawed expert evidence that have already occurred must be taken into account. Moreover, we believe that steps could be taken that would reduce the potential for such miscarriages of justices to occur. We recommend that a Scientific Review Committee be established within the Criminal Cases Review Commission. This Committee would be charged with handling complaints about expert evidence and, even where there are no grounds for an appeal, should work closely with the main forensic providers and the CRFP to address any problems identified with an expert's conduct. The Scientific Review Committee should also work closely with the Forensic Science Advisory Council once it is set up.

Training of judges and lawyers in forensic evidence

177. Brian Thompson, secretary of the Expert Witness Institute, has pointed out that the success of the adversarial system in ensuring that expert witness testimony stands up to scrutiny depends on the proficiency of the lawyers involved, commenting that “There is a real danger that if lawyers do not understand expert evidence then it will not be properly tested”.⁴⁰⁷ In the course of this inquiry, we heard repeated calls for better training of judges and the legal profession. We were particularly pleased to hear the Minister acknowledging that “it is an area we need to develop”.⁴⁰⁸

Lawyers

178. Dr Ann Priston, Vice-President of the Forensic Science Society, told us in oral evidence of the “tremendous lacking in training [in forensic evidence] for lawyers at all levels” and said that “training should be part of a lawyer’s training right at the very outset, from pupil barrister upwards”.⁴⁰⁹ Graham Cooke, a barrister, also remarked: “There is a real problem with DNA evidence [...] the Bar is taught nothing. It relies upon its general principle of doing the right thing, which is that in any area of law you should check your case and look up the authorities [...] the Bar is a disgrace in this”.⁴¹⁰

179. The Bar Council, unsurprisingly, did not accept this view, telling us that “the Bar is generally well skilled in this area”, but it also admitted that “training [in forensic evidence] is not delivered to everyone, is not mandatory, and depends largely on the professionalism of the advocate”.⁴¹¹ The Bar Council additionally noted that “All members of the Bar, however experienced, are now expected to receive a minimum period of 12 hours continuing education each year in order to acquire an annual practising certificate” and “Most do more than that anyway”.⁴¹²

180. The CPS also does not give its lawyers any mandatory training in the understanding and presentation of forensic evidence. However, all Chief Crown Prosecutors “received a brief awareness raising session (of the new Prosecution Team DNA Guidance)” and the

407 Brian Thompson, *Expert Witnesses in the dock, The Barrister*, 2004

408 Q 612

409 Q 191, 194

410 Q 515

411 Ev 163

412 Ev 163

CPS, like the Bar Council, drew our attention to the requirement for lawyers to undertake continuing professional development.⁴¹³ In addition, guidance is made available to the prosecution team on topics such as the presentation of DNA evidence. The CPS sent us a number of examples of the available guidance, produced by the CPS and others such as the FSS and ACPO. **While we have no particular complaints about the quality of the guidance available to lawyers on the understanding and presentation of forensic evidence, it is of great concern that there is currently no mandatory training for lawyers in this area. In view of the increasingly important role played by DNA and other forensic evidence in criminal investigations, it is wholly inadequate to rely on the interest and self-motivation of the legal profession to take advantage of the training on offer. We recommend that the Bar make a minimum level of training and continuing professional development in forensic evidence compulsory.**

Judges

181. We were presented with a similarly disturbing picture of the levels of training given to judges. Judge Anthony Thorpe, Resident Judge at Chichester Crown Court, agreed with Mr Cooke's assessment that "When it comes to DNA I am afraid [...] senior judges are innumerate".⁴¹⁴ Judge Thorpe explained that "for most of the judges, apart from the lectures which you get at the seminars run by the Judicial Studies Board, it is probably on-the-job training".⁴¹⁵ Dr Priston has herself run courses for circuit judges and said that, in her experience, "it is hard to get them [the judges] to come but, when they do come, they love it and they all say, 'We had no idea of the detail'".⁴¹⁶ It is also of interest that the joint report from the Royal College of Pathologists and the Royal College of Paediatrics and Child Health recommended that "Establishing the expertise of witnesses should be included in judicial training".⁴¹⁷

182. The Government-funded Judicial Studies Board is responsible for delivering training material and courses to judges and magistrates. All circuit judges receive formal residential training for four days every three years (continuation seminars), as well as attending an annual one day session. Criminal continuation seminars always include "some input from an expert", whether from the medical, DNA or mental illness specialties.⁴¹⁸ In addition, judges authorised to try serious sexual offences cases receive specialist training which touches on issues of expert evidence. Both Judge Thorpe and the Bar Council pointed out that any increase in the amount of training given to judges must be considered in the context of the heavy costs associated with releasing judges from the courts. Improving the training given to lawyers in the understanding and presentation of forensic evidence should eventually produce judges with a more solid understanding of these topics. However, in light of the rapid pace of scientific progress, **we recommend that judges be given an annual update on scientific developments of relevance to the courts.** The

413 Ev 174

414 Q 432-433

415 Q 427

416 Q 195

417 The Royal College of Pathologists and The Royal College of Paediatrics and Child Health, *Sudden unexpected death in infancy: A multi-agency protocol for care and investigation*, September 2004

418 Ev 169

introduction of mechanisms to enable scientists and experts to give feedback on their experience in court (see paragraphs 163 and 176) should enable production of better targeted training material, and the introduction of *Daubert*-style tests should also help to ensure that judges have more scientific input when making decisions about whether to admit expert evidence.

Specialist judges and lawyers

183. It is unrealistic to expect every barrister and judge to acquire a specialist's understanding of all the many elements of forensic science. It is more important that a good grounding in the most commonly encountered areas, such as DNA evidence, becomes a routine component of training for the legal profession. Nevertheless, there will be a minority of cases where the ability of the lawyer or judge to fully comprehend complex scientific or technical evidence could have a major bearing on the case. We asked the CPS whether it would support the development of a group of barristers and solicitors with specialist expertise. The CPS rightly pointed out that "Evidence (e.g. digital & DNA) is now no longer limited to serious crime, but is used throughout the criminal law, including volume crimes".⁴¹⁹ The CPS used this to justify the assertion that "To support the creation of a narrow group of specialists would be counterproductive to the need for the widespread knowledge and skills of all prosecutors".⁴²⁰ The Bar Council also expressed concern that direct training of judges in particular specialisms "would open them up to the criticism that they might be substituting their un-examinable views for the views of the expert before them. This would detract from the concept of open justice".⁴²¹

184. We agree with the CPS that it is impractical and undesirable to have pools of expert lawyers for every potential speciality, and with the Bar Council that judges (or lawyers) should not usurp the role of witnesses. Nonetheless, we believe that the concept of specialist judges and lawyers for cases relying on complex forensic evidence has not been given sufficient consideration. There are certain areas, such as the digital evidence specialities, which are becoming critical in a growing number of cases. Furthermore, the potential complexity of such cases is escalating all the time. A spin off benefit to offering specialised training to lawyers would be an overall increase in the number of scientifically-literate lawyers (and thus, in the fullness of time, judges). **We recommend that the Home Office issue a consultation on the development of a cadre of lawyers and judges with specialist understanding of specific areas of forensic evidence. An additional benefit to this would be the creation of a small group of judges and prosecution and defence lawyers with the ability and current knowledge to act as mentors to their peers when required.** The possibility of trials without jury is raised in paragraph 167. Whilst specialist lawyers and judges could obviously play a role in that system, they could equally make a useful contribution to jury trials.

419 Ev 174

420 Ev 174

421 Ev 168

Conclusion

185. Forensic science is now central to the detection and deterrence of crime, conviction of the guilty and exculpation of the innocent. Moreover, the significance of forensic science to the criminal justice system can be expected to intensify in years to come.

186. The FSS has occupied a pivotal position in the forensic science arena in England and Wales for many years. In that time it has become the world leader in forensic science and a major asset to UK policing. It is generally acknowledged that the FSS could benefit from changes to its Trading Fund status in order to give it greater access to capital and commercial freedom, but the mechanism by which this should be achieved is a subject of contention. The Government has a responsibility to render the process of decision making over the future of the FSS as transparent as possible. If it fails to do so, this could do irreparable damage to the confidence and morale of the staff whose commitment has been essential to the past success of the FSS.

187. We urge the Government to fulfil its promise to fully test the merits of the GovCo model for the FSS: it must not be set up to fail. If the Government does decide to develop the FSS as a PPP, it is essential that it puts in place safeguards to guarantee continued access to the full range of services at affordable price and of the required quality standards for the police and criminal justice system. It is a risky and irresponsible strategy to rely on market forces to achieve this. The Government will also have to ensure that it does everything possible to maintain public confidence during this process.

188. At present, there is no one person or organisation with responsibility for taking an overview of forensic science, from education and training through to R&D and its use in court. We recommend the establishment of a Forensic Science Advisory Council to serve as a regulator for the developing market in forensic service and as an independent source of advice. The Forensic Science Advisory Council could also oversee cross-cutting inspections of the entire chain of processes by which forensic science is employed in the criminal justice system. We also highlight the need for proper independent oversight, with ethical and lay input, of the National DNA Database.

189. While we recognise that the number of miscarriages of justice associated with expert evidence may be relatively low, we are extremely concerned by the lack of safeguards to prevent such miscarriages of justice from happening, and the complacency of the legal profession in regard to these matters. The complexity and role of forensic evidence are ever increasing and we have not seen evidence to reassure us that the criminal justice system has kept pace with these developments, or will be able to do so in the future. We have made a number of recommendations that we believe could improve the quality and treatment of expert evidence and decrease the potential for miscarriages of justice due to flawed expert evidence. These include greater scientific input and oversight through the establishment of both a Scientific Review Committee within the Criminal Cases Review Commission and a Science and the Law Forum, increased use of pre-trial hearings (in line with the Criminal Procedure Rules), and forensic and process training for all those involved in the criminal justice system as a condition of the role.

Conclusions and recommendations

1. The low visibility of the Home Office Chief Scientific Adviser is a source of concern, particularly in view of the history of weak scientific culture in the department. (Paragraph 7)
2. The Government's poor track record at managing PPP projects does not inspire confidence in its ability to make a success of developing the FSS as a PPP. (Paragraph 35)
3. We believe that a decision to expand the duration of the GovCo phase from a matter of minutes to up to two years is a sufficiently drastic change of pace to constitute a change of policy. Furthermore, the statement of January 11 2005 which vowed to test the GovCo model for the PPP in its own right is not consistent with the original acceptance of the McFarland Review in July 2003, which invoked GovCo only as a precursor to PPP. The Government's presentation of the decision has been misleading and confusing. At a time when the FSS and its staff have been seeking reassurance and clarity over the future of the organisation, the mixed messages being sent out by the Government are regrettable and damaging. (Paragraph 41)
4. The Home Office's evidence clearly implies that, contrary to the impression given in its earlier statement, progression to PPP could indeed occur in the absence of agreement by all stakeholders that this is the best way to proceed. It is hard not to interpret the statement as an attempt to mollify those who opposed the PPP by using deliberate obfuscation. (Paragraph 42)
5. Other than the change in ministerial responsibilities, we have not heard any convincing reasons for the delay between the statement that the FSS would become a PPP and the announcement of further details on the plans to develop the FSS. This 18 month delay has been to the detriment of the FSS and its staff. It is also indicative of poor planning that, following this long delay, a very tight deadline was set for the FSS GovCo to come into being. (Paragraph 44)
6. It is worrying that the Government will have full responsibility both for designing the criteria by which the success of the FSS GovCo and the desirability of PPP will be assessed, and for making the assessment of whether those criteria have been met. Moreover, the Government, as sole shareholder, will have a significant influence over the management of the FSS through this transition; this in turn impacts on the chances of success at each stage. There is a pressing need for greater transparency and independent oversight of this process. We recommend that the Government make public the specific criteria that will be used for evaluating the success of GovCo and the need for progression to PPP. In addition, we recommend that the National Audit Office report on the Government's management of the transformation of the FSS in order to provide some level of independent scrutiny of the process. (Paragraph 46)
7. Very clear evidence would be needed to justify a transition from GovCo status to a PPP. It should not be assumed that a GovCo is merely a transition step leading to a

PPP and, if the FSS is successful as a GovCo, it should remain as such. (Paragraph 47)

8. If the FSS becomes a PPP, the Government must put in place measures to ensure that the criminal justice system has continued access to the full range of forensic services at an affordable price—whether provided by the FSS or another supplier. We recommend that this be done on a force by force basis through agreements between police forces and suppliers, within the framework of the police procurement strategy. (Paragraph 49)
9. It is now up to both the Home Office and the FSS management team to take positive action to address the concerns expressed by staff over their own personal future at the FSS and their wider apprehensions about the future of the organisation. (Paragraph 50)
10. The Home Office appears to view a future global market in forensic services, where the UK provides an increasing proportion of services to other countries and foreign companies have an ever more significant role in the UK, as a natural extension of the status quo. We have seen no evidence that this view is based on a thorough analysis of the long-term implications of this scenario, either in terms of the realistic opportunities for the FSS (and other UK based companies) to gain a significant foothold in overseas markets, or in terms of whether extensive foreign involvement in the provision of services to the UK criminal justice system could jeopardise security or affect public confidence. We recommend that it undertakes such an analysis. (Paragraph 54)
11. At this time of transition in the forensic services market, the need for an independent regulator is becoming ever more critical. We recommend that the Government establish a Forensic Science Advisory Council to oversee the regulation of the forensic science market and provide independent and impartial advice on forensic science. (Paragraph 60)
12. The Council would also be ideally placed to review, or to commission inspections of, the use of forensic science across the whole of the criminal justice system, and to propose improvements where necessary. (Paragraph 60)
13. The arguments for the retention of DNA profiles of suspects who are not ultimately convicted in the interests of fighting crime need to be balanced against any potential infringement of civil liberties arising from this policy. (Paragraph 69)
14. DNA evidence now represents a vital instrument for facilitating investigations and securing convictions. We believe that the recent expansion of the database would make a review of the impact of the NDNAD on the detection and deterrence of crime timely. (Paragraph 71)
15. Independent research should be undertaken to assess the public attitude towards retention of DNA samples (both from convicted criminals and others), and the evidence of benefits associated with this practice. (Paragraph 72)

16. We do not understand why consent should be irrevocable for individuals who are giving DNA samples on a voluntary basis. (Paragraph 75)
17. Inviting a member of the Human Genetics Commission to sit on the NDNAD Board does not substitute for instigating proper arrangements for ethical and lay input. In failing to respond more positively to the calls for independent oversight of the database, the Home Office gave the impression that it was not a high priority. (Paragraph 77)
18. We welcome the fact that the Home Office is to revise the custodianship arrangements for the NDNAD, and in particular the decision to remove the custodianship function from the FSS. However, we have not heard any firm commitment by the Home Office to establish an independent body with full ethical and lay input to oversee the workings of the database, in accordance with the recommendations of the Human Genetics Commission and others. Failure to do this at this juncture would be a wasted opportunity. (Paragraph 80)
19. We regret the Home Office's misleading representation of the position of the Human Genetics Commission and its failure to take on board the Commission's criticisms. (Paragraph 81)
20. It is extremely regrettable that for most of time that the NDNAD has been in existence there has been no formal ethical review of applications to use the database and the associated samples for research purposes. The recent initiation of negotiations with the Central Office for Research Ethics Committees is too little too late. (Paragraph 82)
21. We are concerned that the introduction of familial searching has occurred in the absence of any Parliamentary debate about the merits of the approach and its ethical implications. (Paragraph 84)
22. Any future extension to the applications for which the data in the NDNAD can be used must be subject to public scrutiny. (Paragraph 85)
23. We recognise that adventitious matches are extremely unlikely under the current regime. Nevertheless, we find Professor Sir Alec Jeffreys' warning that the "consequences of even one false match leading to a conviction that was subsequently overturned could be severe for the DNA database and its public acceptability" sufficiently persuasive to merit a thorough investigation of the benefits and risks of staying with the current 10 marker system and moving to, for argument's sake, a 16 marker system. We therefore recommend that the Government commission a cost-benefit analysis for this move. (Paragraph 88)
24. The Government should continue to make funding available to enable the upgrading of SGM profiles currently stored in the NDNAD to SGM Plus profiles. We further recommend that cases where DNA evidence has been used to convict someone who continues to protest their innocence should be kept live so that if another profile is added to the NDNAD that matches that used in the conviction of the individual, it will be spotted and acted upon. (Paragraph 89)

25. The police and the Home Office must ensure that they give adequate attention to the access and custodianship arrangements of other national forensic databases and put in place mechanisms for data sharing between suppliers where required. (Paragraph 90)
26. Increasing the connectivity of different databases, whether at the national or international level, may have significant ethical implications. The Government must take this into account when considering the linking or cross-referencing of forensic databases. (Paragraph 91)
27. The two largest employers of forensic scientists in the UK are the police and the Forensic Science Service, responsibility for which falls within the remit of the Home Office. It is disappointing that, in view of the concerns expressed to us by the police and the wider forensic science community over standards in forensic science education, the Home Office has taken no action to communicate the existence of these problems to colleagues at DfES. We regret this lack of co-ordination between the Home Office and DfES. (Paragraph 95)
28. We trust that the Forensic Science Society will take on board the criticisms of major providers of forensic science courses in the further development of its accreditation scheme. (Paragraph 97)
29. Although we recognise the need for some kind of quality control system to be put in place, the fact that the two main employers in the forensic science sector will not give preferential treatment to graduates of accredited courses somewhat undermines the value of the Forensic Science Society's scheme. Furthermore, it sends out a confusing message to students and may give them the erroneous impression that opting for an accredited course will automatically increase their chances of subsequent employment in the sector. (Paragraph 98)
30. There is an opportunity to harness the excitement surrounding forensic science to promote interest in science more generally. Academically rigorous and scientifically sound joint honours degrees in forensic science and chemistry, biology etc. could build on the appeal of forensic science while providing students with the analytical skills and scientific background required by employers. These degrees need to be developed in close collaboration with the main employers in order to ensure that graduates would be well qualified for the roles for which these organisations recruit. (Paragraph 100)
31. We recommend that the Forensic Science Society, SEMTA and the main employers work together with the Royal Society of Chemistry to promote an understanding of the value of chemistry as a route into forensic science. This could be done, for example, through visits into schools by practising forensic scientists. (Paragraph 101)
32. We welcome the actions taken by ACPO to improve police training in forensic science and urge it to continue, and enhance, these efforts in the future. Forensic science is not just a means of proving someone's guilt or innocence. If used properly, forensic techniques can serve as vital intelligence tools to underpin the entire investigative process. Forensic science has a key role to play in enabling the intelligence-led approach to policing embodied by the National Intelligence Model.

It is thus essential that police training in forensic science is delivered within the context of the National Intelligence Model. This should help to ensure that forensic awareness becomes embedded in the wider police force, rather than being confined to those in specialist roles or who have had specific training. (Paragraph 107)

33. We recommend that the Home Office, ACPO and the Association of Police Authorities ensure that regular seminars are held to keep those Chief Officers with responsibilities for forensic matters in a force up to date and active. (Paragraph 108)
34. The multiplicity of organisations involved in identifying and disseminating good practice in forensic science to the police is unhelpful and wasteful. We support ACPO's view that there is a need to rationalise the functions of these bodies and recommend that a single organisation be given overall responsibility for co-ordinating best practice in forensic science for the police. This should be done without delay to prevent further duplication of effort and expenditure. (Paragraph 110)
35. The Forensic Science Advisory Council will be essential for ensuring that the police continue to have access to independent and impartial expert advice on forensic science in a competitive marketplace. (Paragraph 115)
36. At this time of heightened security, it is unacceptable that so many opportunities to develop technologies that could assist in the battle against crime and terrorism are being squandered due to a lack of information for researchers and poor management of the research process. We recommend that the Home Office, Police Science and Technology Strategy Group and the Research Councils examine ways to resolve this. (Paragraph 123)
37. The Home Office has published a high level Police Science and Technology Strategy and developed complex vehicles for its delivery. Yet it has singularly failed to engage with the scientists and engineers working in academia whose research is so essential for meeting the objectives identified in the Strategy. (Paragraph 124)
38. We recommend that the Home Office introduce fast-track grants for moving promising technologies from the proof-of-concept to the market-ready stage. In addition to funding, these grants should incorporate support to expedite the technology transfer process. (Paragraph 125)
39. It is not possible to predict with any certainty the impact that development as GovCo and possibly as a PPP will have on the amount of R&D undertaken by the FSS. We are concerned that this impact could be negative. Should there be any significant fall in the percentage of R&D conducted by the FSS, the Government may need to introduce incentives to stimulate R&D in this sector. (Paragraph 127)
40. The IPR that has been developed within the FSS must remain freely available to the police once the FSS becomes a GovCo and potentially a PPP. (Paragraph 129)
41. The CRFP must itself be subject to regular independent auditing of the assessment processes used to grant accreditation and renewal of accreditation, as well as the disciplinary procedures. It is essential that the CRFP is, and is seen to be, transparent,

accountable and independent. It must also be seen to exercise its duty of care by vigorous and appropriate actions in respect of malpractice allegations about registrants. (Paragraph 135)

42. As the community of registrants grows in an emerging specialism, the problems associated with the small number of possible assessors should diminish. In the meantime, CRFP must take care to monitor the assessment process carefully, if necessary using the services of overseas experts with appropriate experience and expertise. (Paragraph 136)
43. Providing that the current problems with the Register can be resolved, as the percentage of registered practitioners in the mainstream specialities increases, there will be a strong case for CRFP registration being made mandatory for experts in those specialities presenting evidence to the courts. (Paragraph 139)
44. The Forensic Science Society should also consider making CRFP registration a condition of membership for active practitioners in order to stimulate uptake of accreditation. (Paragraph 139)
45. We are disappointed to discover such widespread acknowledgement of the influence that the charisma of the expert can have over a jury's response to their testimony, without proportional concomitant action to address this problem. If key players in the criminal justice system, including the police and experienced expert witnesses, do not have faith in a jury's ability to distinguish between the strength of evidence and the personality of the expert witness presenting it, it is hard to see why anyone else should. There is clearly no easy answer to this problem, but that does not justify the complacent attitude of the CPS. (Paragraph 142)
46. The training of expert witnesses in the general principles of presentation of evidence to courts and the legal process is essential. For independent forensic practitioners and those who would not otherwise receive such training, the Department for Constitutional Affairs should make funding available to ensure that they do have access to this training in advance of their appearance in court. (Paragraph 144)
47. There is a need for clear guidelines to be issued setting out the acceptable areas of training for witnesses. These guidelines must also take into account the special status of expert witnesses, as distinct from ordinary witnesses. In addition, the guidelines should clearly differentiate between the roles of experts in the family, civil and criminal courts. (Paragraph 145)
48. Pre-trial meetings to identify areas of agreement and disagreement between experts must be held as a matter of routine; it is a false economy not to allow enough time for full discussion at this stage. We trust that the Criminal Case Management Framework and Criminal Procedure Rules 2005 will help to ensure that this happens in future but the Judicial Studies Board should ensure that its guidance emphasises the importance of this to the judiciary. (Paragraph 152)
49. We urge the Legal Services Commission to implement Lord Justice Auld's recommendation to provide for automatic authorisation of funding where a judge is of the view that an expert should be instructed. (Paragraph 156)

50. We are of the view that there is significant room for improvement in the way that statistical evidence, including risks and probabilities, is presented to juries. In order for this to occur, there needs to be a better understanding of the forms of wording and presentation that are easiest to understand, and least misleading, to members of the general public. We do not make a judgement about which form of wording is most apposite for the presentation of DNA evidence but recommend that the decision be informed by research. (Paragraph 162)
51. The absence of formal and permanent channels for forensic scientists and experts to give feedback on their courtroom experiences seems to us to represent a serious flaw in the criminal justice system. We recommend that the Home Office establish a forum for Science and the Law, which meets at least every six months. If the recommendation to set up a Forensic Science Advisory Council is adopted, the forum should be subsumed into this body. (Paragraph 163)
52. Jury research is vital to understand how juries cope with highly complex forensic evidence. Jury research would also be instructive for understanding differences in the way that jurors respond to oral and written reports by experts, and how easy they find interpretation of these reports. We recommend that section 8 of the Contempt of Court Act be amended to permit research into jurors' deliberations. (Paragraph 166)
53. Advancements in science and technology impact on both the techniques used by criminals and the approaches employed in fighting and detecting crime. It is, therefore, highly likely that the number of cases which depend on complex forensic evidence will increase. This is already happening with regard to digital evidence. The Home Office should undertake research to test whether there would be value in extending the arrangements for complex fraud trials to be tried without a jury to other serious cases that rest on highly complex scientific evidence. This research must also address public attitudes towards this possibility. (Paragraph 167)
54. Expert witnesses have been penalised far more publicly than the judge or lawyers in cases where expert evidence has been called into question. These cases represent a systems failure. Focussing criticism on the expert has a detrimental effect on the willingness of other experts to serve as witnesses and detracts attention from the flaws in the court process and legal system which, if addressed, could help to prevent future miscarriages of justice. (Paragraph 170)
55. The absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory. Judges are not well-placed to determine scientific validity without input from scientists. We recommend that one of the first tasks of the Forensic Science Advisory Council be to develop a "gate-keeping" test for expert evidence. This should be done in partnership with judges, scientists and other key players in the criminal justice system, and should build on the US Daubert test. (Paragraph 173)
56. The stance of the Bar Council, Home Office and CPS that the adversarial system provides sufficient safeguards so as to obviate the need for independent scrutiny of

expert evidence is complacent and at odds with the views of the police. (Paragraph 175)

57. Even if problems are rare, the human cost and damage to public confidence in the criminal justice system caused by the miscarriages of justice associated with flawed expert evidence that have already occurred must be taken into account. Moreover, we believe that steps could be taken that would reduce the potential for such miscarriages of justices to occur. We recommend that a Scientific Review Committee be established within the Criminal Cases Review Commission. This Committee would be charged with handling complaints about expert evidence and, even where there are no grounds for an appeal, should work closely with the main forensic providers and the CRFP to address any problems identified with an expert's conduct. (Paragraph 176)
58. While we have no particular complaints about the quality of the guidance available to lawyers on the understanding and presentation of forensic evidence, it is of great concern that there is currently no mandatory training for lawyers in this area. In view of the increasingly important role played by DNA and other forensic evidence in criminal investigations, it is wholly inadequate to rely on the interest and self-motivation of the legal profession to take advantage of the training on offer. We recommend that the Bar make a minimum level of training and continuing professional development in forensic evidence compulsory. (Paragraph 180)
59. We recommend that judges be given an annual update on scientific developments of relevance to the courts. (Paragraph 182)
60. We recommend that the Home Office issue a consultation on the development of a cadre of lawyers and judges with specialist understanding of specific areas of forensic evidence. An additional benefit to this would be the creation of a small group of judges and prosecution and defence lawyers with the ability and current knowledge to act as mentors to their peers when required. (Paragraph 184)

Formal minutes

Wednesday 16 March 2005

Members present:

Dr Ian Gibson, in the Chair

Dr Brian Iddon
Mr Robert Key

Mr Tony McWalter
Dr Desmond Turner

The Committee deliberated.

Draft Report (Forensic Science on Trial), proposed by the Chairman, brought up and read.

Ordered, That the Chairman's draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 189 read and agreed to.

Resolved, That the Report be the Seventh Report of the Committee to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That the provisions of Standing Order No. 134 (Select Committee (reports)) be applied to the Report.

[Adjourned till Wednesday 23 March at nine o'clock.]

Witnesses

Mr Stephen Rimmer, Director of Policing Policy, **Mr Tim Wilson**, Head, Science Policy Unit, and **Mr Mike Silverman**, Forensic Pathology, Science Policy Unit, Home Office Ev 1

Dr Dave Werrett, Chief Executive, and **Mr Bill Griffiths**, Non-Executive Chairman, Forensic Science Service Ev 9

Wednesday 12 January 2005

Mr Alan Kershaw, Chief Executive, and **Professor Evelyn Ebsworth**, Chairman, Council for the Registration of Forensic Practitioners, **Professor Jim Fraser**, President, and **Dr Ann Priston**, Vice-President, Forensic Science Society Ev 19

Dr Angela Gallop, Chief Executive, and **Mr Tom Palmer**, Managing Director, Forensic Alliance, **Dr Nigel Law**, Director of Group Operations, and **Mr Richard Treble**, Forensic Quality Manager, LGC Ev 28

Mr Mike Sparham, Negotiations Officer, and **Ms Helen Kenny**, Prospect FSS Branch Secretary, Prospect; **Mr Jeremy Gautrey**, Negotiations Officer, and **Mr Alan Organ**, PCS FSS Branch Secretary, PCS Ev 34

Wednesday 26 January 2005

Mr David Coleman, Chief Constable, Derbyshire Constabulary, **Mr Clive Wolfendale**, Deputy Chief Constable, North Wales Police, **Mr Barry Taylor**, Deputy Chief Constable, Dyfed Powys Police and **Mr Gary Pugh**, Directorate of Forensic Services, Metropolitan Police Service Ev 38

Professor Sir Alec Jeffreys, Department of Genetics, University of Leicester, **Professor Stephen Haswell**, Analytical Science Group, University of Hull, **Professor Tony Sammes**, Centre for Forensic Computing, the Royal Military College of Science, Cranfield University and **Professor Sue Black**, Department of Anatomy and Forensic Anthropology, University of Dundee Ev 47

Monday 31 January 2005

Ms Karen Squibb-Williams, and **Mr Nimesh Jani**, Lawyers and Policy Advisers, Crown Prosecution Service, **Mr Graham Cooke**, Barrister, Bar Council, and **Judge Anthony Thorpe**, Resident Judge, Chichester Crown Court Ev 57

Wednesday 9 February 2005

Caroline Flint, a Member of the House, Parliamentary Under-Secretary of State for Reducing Organised and International Crime, Anti-Drugs Co-ordination and International and European Unit, **Dr Lyn Fereday**, DNA Expansion Programme Manager, and **Mr Tim Wilson**, Head, Science Policy Unit, Home Office Ev 73

Written Memoranda

1	Home Office	Ev 91, 157, 160, 202, 212
2	University of Strathclyde	Ev 102
3	Council for the Council for the Registration of Forensic Practitioners (CRFP)	Ev 105
4	Metropolitan Police Service	Ev 113
5	Forensic Alliance Limited	Ev 116, 195
6	Prospect and the Public and Commercial Services Union (PCS)	Ev 121
7	LGC	Ev 125
8	Association of Chief Police Officers of England, Wales and Northern Ireland	Ev 128,199
9	Document Evidence Limited	Ev 132
10	Royal Society of Edinburgh (RSE)	Ev 135
11	Biosciences Federation	Ev 137
12	GeneWatch UK	Ev 140
13	QinetiQ	Ev 144
14	The Royal Society of Chemistry	Ev 146
15	Ian W Parkinson	Ev 147
16	Engineering and Physical Sciences Research Council (EPSRC)	Ev 151
17	Forensic Science Service	Ev 154, 175
18	Forensic Science Society	Ev 156
19	Bar Council of England and Wales and the Criminal Bar Association	Ev 161
20	Crown Prosecution Service	Ev 169, 171
21	Professor Sir Alec Jeffreys	Ev 170
22	Department of Forensic and Investigative Science, University of Central Lancashire	Ev 189
23	Dr Robert Keith Bramley, Custodian of the National DNA Database	Ev 191
24	Human Genetics Association	Ev 194
25	Graham Cooke, Barrister	Ev 209

Reports from the Science and Technology Committee since 2001

Session 2004-05

First Report	The Work of the Economic and Social Research Council (<i>Reply HC 401</i>)	HC 13
Second Report	Annual Report 2004	HC 199
Third Report	Office of Science and Technology: Scrutiny Report 2004 (<i>Reply HC 453</i>)	HC 8
Fourth Report	The Medical Research Council's Review of the Future of the National Institute for Medical Research (<i>Reply HC 454</i>)	HC 6
Fifth Report	Human Reproductive Technologies and the Law	HC 7
Sixth Report	The Work of Research Councils UK	HC 219

Session 2003-04

First Report	Annual Report 2003	HC 169
Second Report	Chief Executive of the Medical Research Council: Introductory Hearing (<i>Reply HC 629</i>)	HC 55
Third Report	The Work of the Biotechnology and Biological Sciences Research Council (<i>Reply HC 526</i>)	HC 6
Fourth Report	Office of Science and Technology: Scrutiny Report 2003 (<i>Reply HC 588</i>)	HC 316
Fifth Report	<i>Too Little too late?</i> Government Investment in Nanotechnology (<i>Reply HC 650</i>)	HC 56
Sixth Report	Within REACH: the EU's new chemicals strategy (<i>Reply HC 895</i>)	HC 172
Seventh Report	Director General for Higher Education: Introductory Hearing (<i>Reply HC 1015</i>)	HC 461
Eighth Report	The Work of the Council for the Central Laboratory of the Research Councils (<i>Reply HC 1199</i>)	HC 462
Ninth Report	Director General of the Research Councils: Introductory Hearing (<i>Reply HC 1059</i>)	HC 577
Tenth Report	Scientific Publications: Free for all?	HC 399
Eleventh Report	Research Assessment Exercise: a re-assessment (<i>Reply HC 34, 2004-05</i>)	HC 586
Twelfth Report	Government support for Beagle 2 (<i>Reply HC 301, 2004-05</i>)	HC 711
Thirteenth Report	The Use of Science in UK International Development Policy (<i>Reply HC 235, 2004-05</i>)	HC 133
Fourteenth Report	Responses to the Committee's Tenth Report, Session 2003-04, Scientific Publications: Free for all? (<i>Reply HC 249, 2004-05</i>)	HC 1200

Session 2002–03

First Report	The Work of the Particle Physics and Astronomy Research Council (<i>Reply HC 507</i>)	HC 161
Second Report	Annual Report 2002	HC 260
Third Report	The Work of the Medical Research Council (<i>Reply Cm 5834</i>)	HC 132
Fourth Report	Towards a Non-Carbon Fuel Economy: Research, Development and Demonstration (<i>Reply HC 745</i>)	HC 55
Fifth Report	The Work of the Natural Environment Research Council (<i>Reply HC 1161</i>)	HC 674
Sixth Report	UK Science and Europe: Value for Money? (<i>Reply HC 1162</i>)	HC 386
Seventh Report	Light Pollution and Astronomy (<i>Reply HC 127, 2003-04</i>)	HC 747
Eighth Report	The Scientific Response to Terrorism (<i>Reply Cm 6108</i>)	HC 415
Ninth Report	The Work of the Engineering and Physical Sciences Research Council. (<i>Reply HC 169, 2003-04</i>)	HC 936

Session 2001-02

First Report	Cancer Research – A Follow-Up (<i>Reply Cm 5532</i>)	HC 444
Second Report	The Research Assessment Exercise (<i>Reply HC 995</i>)	HC 507
Third Report	Science Education from 14 to 19 (<i>Reply HC 1204</i>)	HC 508
Fourth Report	Developments in Human Genetics and Embryology (<i>Reply Cm 5693</i>)	HC 791
Fifth Report	Government Funding of the Scientific Learned Societies (<i>Reply HC 53</i>)	HC 774
Sixth Report	National Endowment for Science, Technology and the Arts: A Follow-Up (<i>Reply HC 276</i>)	HC 1064
Seventh Report	The Office of Science and Technology: Scrutiny Report 2002 (<i>Reply HC 293</i>)	HC 860
Eighth Report	Short-Term Research Contracts in Science and Engineering (<i>Reply HC 442</i>)	HC 1046