

HOUSE OF LORDS

Science and Technology Select Committee

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3rd Report of Session 2017–19

# Forensic science and the criminal justice system: a blueprint for change

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Evidence is published online at <https://www.parliament.uk/forensic-science-lords-inquiry> and available for inspection at the Parliamentary Archives (020 7219 3074).

Q in footnotes refers to a question in oral evidence.

## SUMMARY

In many criminal cases forensic science evidence is pivotal. The delivery of justice depends on the integrity and accuracy of that evidence, and the trust that society has in it. The quality and delivery of forensic science in England and Wales is inadequate. In her most recent annual report published on 15 March 2019, the Forensic Science Regulator issued a stark warning that “profound changes to funding and governance are required to ensure that forensic science survives and begins to flourish rather than lurching from crisis to crisis.” Tellingly, she emphasised that the focus of the Government should be on “the protection of justice rather than the protection of historic or current policies.”<sup>1</sup>

We have found that there has been a serious deficit of high-level leadership and oversight of forensic science from the Home Office and Ministry of Justice. Following our evidence session with the Ministers, we were not persuaded that enough had been done to address the piecemeal oversight and accountability of forensic science. We recommend that a Forensic Science Board be created to deliver a new forensic science strategy and take responsibility for forensic science in England and Wales.

Simultaneous budget cuts and reorganisation, together with exponential growth in the need for new services such as digital evidence, have put forensic science providers under extreme pressure. The result is a forensic science market which is becoming dysfunctional and which, unless it is properly regulated, will soon suffer the shocks of major forensic science providers going out of business and putting justice in jeopardy. We recommend the role of the Forensic Science Regulator is reformed, expanded and resourced to provide this market regulation function.

This is not just a budget issue: structural and regulatory muddle exacerbates the malaise. There is no consistency in the way in which the 43 Police Authorities commission forensic services. Some Police Authorities have taken forensic investigation predominantly in-house whilst outsourcing some services to unregulated providers. These actions call into question equitable access for defendants and raise issues over the quality of the analysis undertaken and the evaluation of the evidence presented. We recommend that the Forensic Science Regulator should urgently be given a number of statutory powers to bolster trust in the quality of forensic science provision.

Fair access to justice for defendants is further hampered by cuts to legal aid. The defence must have the opportunity to commission their own forensic testing where evidence is disputed. We recommend that the Forensic Science Regulator should work with the Legal Aid Agency to set fair prices for forensic testing for which the Ministry of Justice must then commit to provide funding.

The rapid growth of digital forensic evidence presents challenges to the criminal justice system. We were not presented with evidence of any discernible strategy to deal with them. There is a need for legal practitioners to develop a better understanding of what can be achieved by digital forensic evidence and in what realistic timescales. The Government must prioritise investment in research on

1 Forensic Science Regulator, *Annual Report November 2017–November 2018*, (15 March 2019): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/786137/FSRAnnual\\_Report\\_2018\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786137/FSRAnnual_Report_2018_v1.0.pdf) [accessed 22 March 2019]

automation techniques for the retrieval and analysis of large volumes of digital evidence.

Research and development in forensic science is under-resourced and uncoordinated. This has resulted in serious concerns about the scientific validity of some forensic science fields and the capability to provide evaluative interpretation of forensic science evidence. We recommend creating a National Institute for Forensic Science to set strategic priorities for forensic science research and development, and to coordinate and direct research and funding.

During our inquiry, coverage in national newspapers included “Fund forensics or more crimes will go unsolved”<sup>2</sup> and “Most police forces fail to meet fingerprint evidence standards”,<sup>3</sup> which highlight the urgency of addressing the issues in forensic science.

Unless these failings are recognised and changes made, public trust in forensic science evidence will continue to be lost and confidence in the justice system will be threatened. Crimes may go unsolved and the number of miscarriages of justice may increase. Furthermore, world-leading specialist expertise will be under-used, and England and Wales may never regain its reputation as holding the international benchmark for forensic science. This report follows others that have raised similar concerns, yet the changes that are necessary have not been made, despite acknowledgements that they would be. Forensic science in England and Wales is in trouble. To ensure the delivery of justice, the time for action is now.

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2 ‘Fund forensics or more crimes will go unsolved’, *The Times* (7 February 2019): <https://www.thetimes.co.uk/article/fund-forensics-or-more-crimes-will-go-unsolved-x50npzd5c> [accessed 25 March 2019]

3 ‘Most police forces fail to meet fingerprint evidence standards’, *The Guardian* (7 January 2019): <https://www.theguardian.com/science/2019/jan/07/police-forces-fail-to-meet-forensics-fingerprint-evidence-standards> [accessed 25 March 2019]

# Forensic science and the criminal justice system: a blueprint for change

## CHAPTER 1: INTRODUCTION

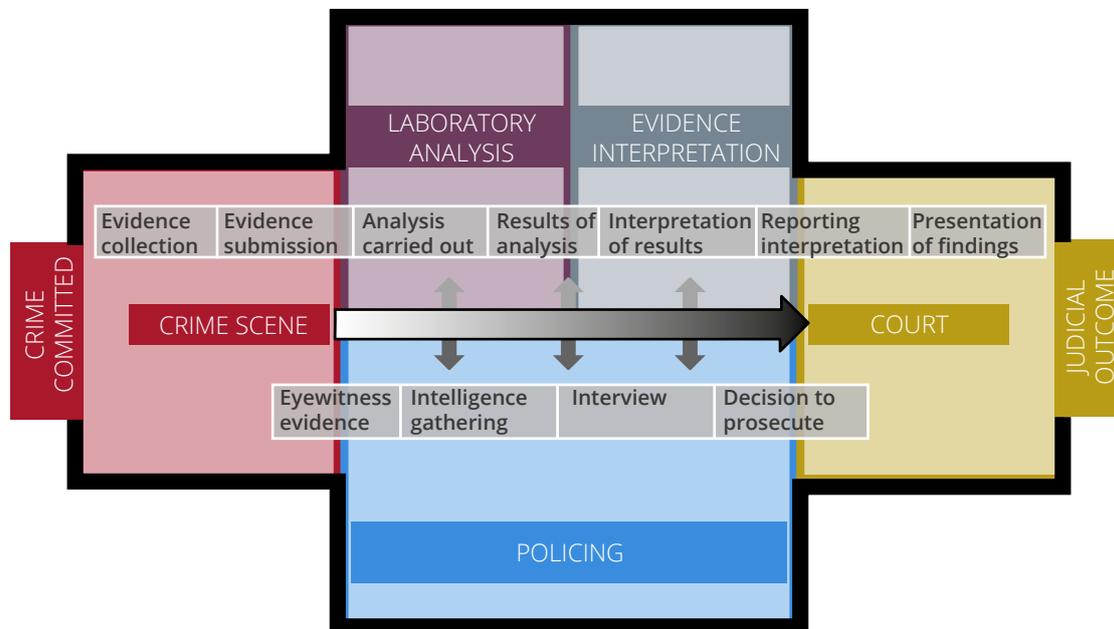
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### Background

1. Forensic science has been under sustained scrutiny over the last 10 years. It is a complex discipline that interacts with a range of fields, including science, policing, government and law. There are clear, deep-rooted challenges that have been identified but not addressed. In this inquiry the fundamental importance of effective, robust and high-quality forensic science and its contribution to the justice system have been apparent, as have the dangers of not supporting and enabling world-class forensic science.
2. Forensic science applies scientific methods to the recovery, analysis and interpretation of relevant materials and data in criminal investigations and court proceedings. It is both an intelligence and evidential tool to assist in the delivery of justice.
3. Forensic science is traditionally viewed as a collection of different sub-domains with shared overarching principles, processes, and activities. Within the different sub-domains there is a range of different primary aims, and variability in terms of the scientific underpinning and robustness of the methods employed. Professor Peter Sommer, Professor of Digital Forensics at Birmingham City University, summarised the different categories of forensic science activity:
  - “‘Trace’ or ‘wet’ forensics: where a laboratory carries out one of a series of standard tests to identify or match some material found at a scene of crime or associated with an individual
  - Interpretation: where the result of the examination of the trace is ambiguous but nevertheless some sort of inference or conclusion is desired. “Interpretation” may mean assigning a statistical probability of likelihood, but it can also involve providing a contextual explanation or hypothesis about events
  - Reconstruction of events: where large numbers of different “traces” plus observations and testimonial evidence are combined by a skilled investigator who produces a reconstruction of a sequence of events. Examples include road traffic accidents, murder scenes, the use of mobile phone geolocation data to plot the movements of its owner over time, and the examination of a computer or smart phone to show planning and a course of action related to a crime
  - Opinion evidence: where an expert has looked at a range of circumstances and offers opinion on the basis of skill, training and experience”.<sup>4</sup>

4. Forensic science sits at the nexus of science, law, policy and investigation. It should be viewed as a process that encompasses the crime scene through to court. The following figure shows the different stages of the process and how forensic evidence and human decision-making are integral at each stage:

**Figure 1: Forensic science from crime scene to court**



Source: Morgan, R. M., Nakhaeizadeh, S., Earwaker, H., Rando, C., Harris, A. J. L. Dror, I. E., (2018) *Interpretation of evidence: Cognitive decision making under uncertainty (at every step of the forensic science process)*. In R. Wortley, A. Sidebottom, G. Laycock, & N. Tilley (Eds.), *Handbook of Crime Science* (Abingdon: Routledge, 2016), pp 408–420

### *The state of forensic science*

5. **A free society is dependent on the rule of law which in turn relies on equality of access to justice. The evidence we received points to failings in the use of forensic science in the criminal justice system and these can be attributed to an absence of high-level leadership, a lack of funding and an insufficient level of research and development. Throughout this inquiry we heard about the decline in forensic science in England and Wales, especially since the abolition of the Forensic Science Service.** Professor Claude Roux, Director of Centre for Forensic Science, University of Technology, Sydney, and President of the International Association of Forensic Sciences, told us:

“When I was a student, England and Wales held, essentially, the international benchmark. It was the “Mecca” for forensic science. Some 30 years later, my observation from the outside ... is that it has been an ongoing national crisis and, at this stage, is more of an example not to follow.”<sup>5</sup>

6. In the last 10 years there have been nine reports, each with numerous assessments of the state of forensic science in England and Wales and

recommendations to address the challenges.<sup>6</sup> Additionally, there have been two influential reports from the United States addressing similar issues.<sup>7</sup>

7. Some of the concerns raised in these reports were:
  - Major crimes could go unsolved unless the Government did more to support forensic science.<sup>8</sup>
  - Forensic science provision was under threat because the police were increasingly relying on unregulated experts to examine samples from suspects and crime scenes<sup>9</sup> and cost has become a greater factor in the tendering process than quality.<sup>10</sup>
  - Without statutory powers to enforce compliance, the Forensic Science Regulator could not ensure that science being used in the criminal justice system is being carried out to the required standard.<sup>11</sup>
  - Challenges in relation to the use of digital forensics included the availability of skills, the global nature of cybercrime, the scale of digital forensic investigations, the interface between digital information and physical information, ensuring information was shared in accordance with the requirements of disclosure and communicating this highly technical information throughout the criminal justice process.
  - The scientific evidence base for different types of forensic science was variable and in some cases very limited.

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6 Science and Technology Committee, *Biometrics strategy and forensic services* (Fifth Report, Session 2017–19, HC 800); Science and Technology Committee, *The Forensic Science Service* (Seventh Report, Session 2010–12, HC 855); The Law Commission Consultation Paper No 190, *The Admissibility of Expert Evidence in Criminal Proceedings in England and Wales* (2011): [http://www.lawcom.gov.uk/app/uploads/2015/03/cp190\\_Expert\\_Evidence\\_Consultation.pdf](http://www.lawcom.gov.uk/app/uploads/2015/03/cp190_Expert_Evidence_Consultation.pdf); Science and Technology Committee, *Forensic Science* (Second Report, Session 2013–14, HC 610); Forensic Science Regulator, *Annual Report November 2014–November 2015* (4 December 2015): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/482248/2015\\_FSR\\_Annual\\_Report\\_v1\\_0\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/482248/2015_FSR_Annual_Report_v1_0_final.pdf); Forensic Science Regulator, *Annual Report November 2015–November 2016* (6 January 2017): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/581653/FSR\\_Annual\\_Report\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/581653/FSR_Annual_Report_v1.0.pdf); Forensic Science Regulator, *Annual Report November 2016–November 2017* (19 January 2018): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/674761/FSRAnnual\\_Report\\_2017\\_v1\\_01.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674761/FSRAnnual_Report_2017_v1_01.pdf); Forensic Science Regulator, *Annual Report November 2017–November 2018* (15 March 2019): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/786137/FSRAnnual\\_Report\\_2018\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786137/FSRAnnual_Report_2018_v1.0.pdf) and Government Office for Science, *Forensic Science and Beyond: Authenticity, Provenance and Assurance, Annual Report of the Government Chief Scientific Adviser 2015* (2015): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/506461/gs-15-37a-forensic-science-beyond-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/506461/gs-15-37a-forensic-science-beyond-report.pdf) [accessed 15 February 2019]

7 Committee on Identifying the Needs of the Forensic Science Community, National Research Council of the National Academies, *Strengthening Forensic Science in the United States: A Path Forward* (September 2016): <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> and Executive Office of the President, President’s Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (September 2016): [https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast\\_forensic\\_science\\_report\\_final.pdf](https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf) [accessed 15 February 2019]

8 Science and Technology Committee, *Forensic Science* (Second Report, Session 2013–14, HC 610)

9 Briefing for the House of Commons Science and Technology Committee, *The Home Office’s oversight of forensic services* (December 2014): <https://www.nao.org.uk/wp-content/uploads/2015/01/The-Home-Office%E2%80%99s-oversight-of-forensic-services.pdf> [accessed 25 March 2019]

10 Forensic Science Regulator, *Annual Report November 2016–November 2017* (19 January 2018): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/674761/FSRAnnual\\_Report\\_2017\\_v1\\_01.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674761/FSRAnnual_Report_2017_v1_01.pdf) [accessed 15 February 2019]

11 *Ibid.*

- The adverse effect of the closure of the Forensic Science Service in 2012 and its implications for the continued delivery of forensic science and research.
  - The reduction of budgets for forensic science and the effect on service delivery.
8. Despite these reports raising concerns about a range of issues affecting the administration of justice, it appears that little has changed as a result.

### **Our inquiry**

9. In this inquiry we considered the contribution of forensic science to the delivery of justice and the understanding of forensic science evidence in the criminal justice system. We examined the scientific evidence base for different techniques and the regulatory framework which underpins standards in the sector. We also considered the instability of the forensic science market and research.
10. We held 21 oral evidence sessions with over 50 witnesses and received 103 written submissions. We are grateful to all those who gave evidence.<sup>12</sup>
11. The committee visited the Metropolitan Police Service's Directorate of Forensic Services on 16 October 2018. We observed forensic analyses including fingerprint analysis, ballistics comparison and digital forensic analysis. We are grateful to the Metropolitan Police Service for facilitating our visit. Further details of the visit are in appendix 4.
12. We thank our specialist adviser, Professor Ruth Morgan,<sup>13</sup> chair of Crime and Forensic Science at University College London, for her knowledge and enthusiasm. We are also grateful to the Committee staff who worked on the inquiry: Donna Davidson (Clerk), Michael Berry (Graduate Clerk), Cerise Burnett-Stuart (Committee Assistant), and Dr Daniel Rathbone (former Policy Analyst).

### **Structure of this report**

13. Chapter 2 explores the current environment and identifies the gaps in oversight and responsibility and considers what body should provide leadership and accountability to the sector. Chapter 3 examines the fragility of the forensic science market and how it could be better regulated. Chapter 4 considers ways in which accreditation and regulation could be improved to ensure the quality of forensic science. Chapter 5 looks at the use of forensic science evidence in the criminal justice system and the levels of scientific understanding among legal professionals. Finally, Chapter 6 examines research and development and makes recommendations to address current gaps and achieve a more strategic approach.

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<sup>12</sup> All written and oral evidence is online, see House of Lords Science and Technology Committee, 'Forensic science inquiry': <https://www.parliament.uk/forensic-science-lords-inquiry/publications>

<sup>13</sup> Professor Ruth Morgan's registered interests are included in Appendix 1.

## CHAPTER 2: OVERSIGHT, LEADERSHIP AND RESPONSIBILITY

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### Culture and environment

14. A consistent theme that arose in our inquiry was the piecemeal nature of oversight of and responsibility for forensic science in England and Wales. We repeatedly heard that the system was not operating as it should and was in a state of crisis, presenting a threat of undermining trust in the criminal justice system.
15. The Knowledge Transfer Network Forensic Science Special Interest Group thought there was:
 

“a lack of clear leadership, oversight and governance across the wider forensic landscape. A fragmented and weakened marketplace, lack of funding for forensic research supporting the evidence base and a silo approach to forensics in some regions could impact on the national UK forensic communities’ ability to support the current and future needs of the UK judicial system.”<sup>14</sup>
16. There have also been consistent and deep cuts to budgets and resources in all the key stakeholder domains alongside the introduction and development of a competitive market for forensic science. This has had a significant impact on forensic service provision<sup>15</sup>, quality<sup>16</sup>, commissioning<sup>17</sup>, and research<sup>18</sup>.

### Piecemeal governance and oversight of forensic science

17. As forensic science is fragmented, there are challenges in developing a coordinated strategy, a sustainable market, and science with strong theoretical foundations to underpin practice. This piecemeal approach has led to some of the serious and urgent problems facing the sector. Rebecca Endean, Director of Strategy at UK Research and Innovation, described the state of forensic science as “probably as disparate as it could be.”<sup>19</sup>
18. While the Home Office has overall responsibility for forensic science, much of its application is in the courts, which fall under the remit of the Ministry of Justice.
19. The Minister of State at the Home Office, Rt Hon Nick Hurd MP, told us that there were “significant problems that [the Government is] trying to manage”.<sup>20</sup> He said that one reason for this was “that there has been a very fragmented approach to [forensic science] ... The response is to support

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14 Written evidence from the Knowledge Transfer Network Forensic Science Special Interest Group (FoSciSIG) ([FRS0040](#))

15 Written evidence from Northumbria University Centre for Evidence and Criminal Justice Studies (NCECJS) ([FRS0038](#)) and Eurofins Forensic Services (EFS) ([FRS0063](#))

16 Written evidence from Keith Borer Consultants ([FRS0061](#)) and Forensic Science Regulator, *Annual Report November 2016–November 2017* (19 January 2018): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/674761/FSRAnnual\\_Report\\_2017\\_v1\\_01.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674761/FSRAnnual_Report_2017_v1_01.pdf)

17 Written evidence from Dr Martin Hall ([FRS0037](#)), Key Forensic Services Ltd ([FRS0048](#)), and Cellmark Forensic Services ([FRS0071](#))

18 Written evidence from Forensic Science Northern Ireland (FSNI) ([FRS0006](#)), Alere Forensics ([FRS0016](#)), and Professor Wolfram Meier-Augenstein ([FRS0032](#))

19 [Q 150](#) (Rebecca Endean)

20 [Q 222](#) (Nick Hurd MP)

a strategic approach that supports more collective leadership in addressing some of the key capability gaps and identifying the road map”.<sup>21</sup>

20. Rt Hon Nick Hurd MP told us that he was trying to tackle these issues and intended to publish the results of the Government’s review into forensic science service practice and provision along with an implementation plan by the end of March 2019.<sup>22</sup> The review has been led by the Home Office with input from the Association of Police and Crime Commissioners (APCC) and the National Police Chiefs Council (NPCC), as well as involvement from the Ministry of Justice “at official level”.<sup>23</sup>
21. The Parliamentary Under-Secretary at the Ministry of Justice, Lucy Frazer QC MP, was clear that forensic science lay squarely in the remit of the Home Office; she saw the Ministry of Justice as “support[ing]” and “assist[ing]” the Home Office.<sup>24</sup> When asked why the Ministry of Justice did not have a greater role, given that forensic science is essentially about ensuring that justice is done, the minister said that “sometimes it is important for one department to lead on an issue”<sup>25</sup> but agreed to think about how the Ministry of Justice could work better with the Home Office.

*Police and forensic science service-provider fragmentation*

22. Forensic science in England and Wales is now provided by private companies and the police (as outlined in Chapter 3). There is fragmentation in terms of the services provided, with certain types of analysis being undertaken predominantly in the private sector (such as toxicology) and others predominantly by the police ‘in-house’ units (such as fingerprints).<sup>26</sup> Dr Gillian Tully, the Forensic Science Regulator, noted that “the fragmentation of work between multiple police forces and multiple forensic science providers has led to fragmentation of data sets for interpretation of evidence. In a coherent system, data would be gathered and shared more effectively.”<sup>27</sup>
23. Rt Hon Nick Hurd MP talked about the fragmentation within the police: “We have 43 police chiefs. We have 43 police and crime commissioners. We have a Home Office. We have an inspectorate. We have a college. This is a system that historically has not worked together as effectively as anyone would want. There is now a recognition of the need for more collective leadership.”<sup>28</sup> One of the Home Office’s responses has been to set up the Transforming Forensics programme, which aims to address the provision of forensic services in the police forces.

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21 [Q 223](#) (Nick Hurd MP)

22 The review is now likely to be published in April, see letter from the Rt Hon Nick Hurd MP to the Chairman (28 March 2019): <https://www.parliament.uk/documents/lords-committees/science-technology/forensic-science/2019-03-28-ltr-forensic-science-criminal-justice-system-DfID.pdf>

23 [Q 223](#) (Nick Hurd MP)

24 [Q 235](#) (Lucy Frazer QC MP)

25 *Ibid.*

26 [Q 82](#) (Danyela Kellett and Carolyn Lovell)

27 Written Evidence from Dr Gillian Tully ([FRS0057](#))

28 [Q 224](#) (Nick Hurd MP)

*Transforming Forensics programme*

24. The Transforming Forensics programme<sup>29</sup>, launched in 2018, seeks to provide a strategic police response to problems with forensic science arrangements. The programme is overseen by the Police Reform and Transformation Board and funded by the Police Transformation Fund with a £30 million investment from April 2018 to March 2020.
25. Issues which the programme seeks to address include:
- the difficulty in delivering the Policing Vision 2025<sup>30</sup> and the Home Office’s Forensic Science Strategy<sup>31</sup>, including joined up delivery and specialist capabilities;
  - the sustainability of police forces (and their commercial suppliers) given current financial constraints to deliver forensic science;
  - operational fragmentation and non-compliance with the Forensic Science Regulators Code of Practice;
  - challenges of rapidly changing technology, especially in digital forensics and DNA; and
  - the need to be ready to maximise opportunities presented by the Home Office Biometrics, Emergency Services Communications and Digital Policing programmes.<sup>32</sup>
26. While the Transforming Forensics programme has developed since it started in April 2018, it is limited in how far it can meet the challenges facing forensic science. In particular, the programme concerns the police and not private providers or others with interests in forensic science, again emphasising the siloed nature of the forensic science process (as outlined in Chapter 1). Dr David Schudel, a forensic scientist at Keith Borer Consultants, said that the programme further promotes “a continued shift of funding away from one service [private] to the other [police], when in reality we have an expanding amount of forensic evidence.”<sup>33</sup>
27. Those involved in the Transforming Forensics programme were concerned that the Home Office’s lack of willingness to mandate participation by all forces has meant that they have had to spend time and money convincing forces to be involved. Rt Hon Nick Hurd MP explained that his “ability to mandate is limited” by “police operational autonomy”.<sup>34</sup>
28. We have not heard evidence to suggest that the structural issues outlined by the Forensic Science Regulator caused by the fragmentation of forensic

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29 NPCC, ‘Transforming Forensics’ (2018): <https://www.npcc.police.uk/NPCCBusinessAreas/ReformandTransformation/Specialistcapabilitiesmain/SpecialistCapabilitiesProgrammeTransformingForensic.aspx> [accessed 20 March 2019]

30 The Policing Vision 2025 was published jointly by the NPCC and the APCC in 2016 and sets out their plan for policing until 2025 and the challenges that are likely to arise in the 10-year period. NPCC, *Policing Vision 2025* (2016): <https://www.npcc.police.uk/documents/Policing%20Vision.pdf> [accessed 27 February 2019]

31 Home Office, Forensic Science Strategy, Cm 9217, March 2016: [https://assets.publishing.service.gov.uk/gov\\_e\\_rnment/uploads/system/uploads/attachment\\_data/file/506652/54493\\_Cm\\_9217\\_Forensic\\_Science\\_Strategy\\_Accessible.pdf](https://assets.publishing.service.gov.uk/gov_e_rnment/uploads/system/uploads/attachment_data/file/506652/54493_Cm_9217_Forensic_Science_Strategy_Accessible.pdf) [accessed 20 March 2019]

32 Written evidence from NPCC Transforming Forensics Programme (FRS0070), para 6

33 Q 116 (Dr David Schudel)

34 Q 225 (Nick Hurd MP)

science services between the police and private sector are being addressed by the Transforming Forensics programme.<sup>35</sup> It does not present a solution to the current fragmentation or the numerous other issues we consider in this report.

29. Rt Hon Nick Hurd MP said that the “Transforming Forensics programme is our response to some of [the] system failure and that lack of collective working”<sup>36</sup>, but the fact that participation is not mandatory, that it only applies to the police, and that funding after 2020 is not secured means that it will struggle to set a strategic vision.

#### *Research inadequacy*

30. The reduced level of forensic science across the research domain is currently an obstacle for ensuring adequate and strategic research. Different stakeholders across forensic science have distinct knowledge gaps that forensic science research and development can address. The type of research needed in forensic investigation practices to develop the identification, collection and preservation of materials is different, albeit linked, to the research needed to assist evaluative interpretations. As Key Forensic Services said, “Users of forensic science will have different needs. The lack of investment in this area has resulted in complete inertia.”<sup>37</sup> It is clear that there is need, as Rebecca Endean suggested, “for some sort of strategic oversight body which could look across all the funders and identify gaps and key priorities for funding forensic science research.”<sup>38</sup>

#### *Value of forensic science*

31. The lack of coordination within forensic science has made it difficult for anyone to assess the value of the whole system<sup>39</sup> and to justify sustained funding of it. However, the benefits of forensic science can be seen in policing and the justice system and have short and long-term outcomes.
32. James Vaughan, Chief Constable of Dorset Police and the lead on forensic science for the National Police Chiefs Council, explained that “it is very difficult to measure the value of one fingerprint that stops a recidivist from committing a whole spate of domestic burglaries”.<sup>40</sup> The Metropolitan Police Service told us that “forensic science should not be seen as just an evidential tool in investigations but equally as an intelligence tool where its impact may not directly lead to an offender being identified but can contribute to an intelligence profile and lead to proactive investigations into large scale operations.”<sup>41</sup>
33. For these reasons, spending more on forensic science in a strategic and coordinated way can reduce the amount spent by the Home Office and the Ministry of Justice on the criminal justice system. Cellmark Forensic Services detailed how investment in forensic science upfront can deliver savings:

“Rapid forensic science (both at the crime scene and in the laboratory) has the potential to reduce costly police investigative time through early

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35 Written evidence from Dr Gillian Tully ([FRS0057](#))

36 [Q 224](#) (Nick Hurd MP)

37 Written evidence from Key Forensic Services Ltd ([FRS0048](#))

38 [Q 148](#) (Rebecca Endean)

39 Written evidence from Forensic Science Northern Ireland (FSNI) ([FRS0006](#))

40 [Q 15](#) (Chief Constable James Vaughan)

41 Written evidence from Metropolitan Police Service (MPS) ([FRS0064](#))

identification of offenders or the exoneration of innocent suspects; earlier arrests can lead to a lower financial impact of prolific offenders who are otherwise free to re-offend; and of course compelling, high quality forensic science can lead to earlier guilty pleas, quicker trials and a resultant reduction in expensive court time.”<sup>42</sup>

34. These benefits are unlikely to be realised “while there continues to be no linkage of budgets for the commissioning of forensic analysis by the police, to the CPS and judicial budgets”.<sup>43</sup> There is a clear case for a more coordinated approach to forensic science by the Home Office and the Ministry of Justice.

### **Oversight, responsibility and accountability**

35. The lack of strategic oversight, responsibility and accountability for forensic science is a significant problem. Professor Dame Sue Black, Pro-Vice Chancellor for Engagement at Lancaster University, told us that “the forensic science community is weakened due to years of financial disinvestment, unfocussed core strategic leadership and fragmented communication across the ecosystem.”<sup>44</sup> The Knowledge Transfer Network Forensic Science Special Interest Group stated that “there is a need to review and challenge the national leadership, oversight and governance across this wider forensic science landscape. To provide more national cohesion, dedicated strategic leadership and alignment with other government departments is needed.”<sup>45</sup>
36. **It is clear that there is a need to deliver strategic and accountable leadership that reflects all the main stakeholders to set the vision, strategy, and agenda for forensic science.**
37. *The Home Office and the Ministry of Justice are not working closely enough to address the absence of high-level leadership in forensic science. Furthermore, it is necessary to ensure that the operational independence of the police and the independence of the courts and of forensic scientific evidence are safeguarded. Therefore we recommend the creation of a Forensic Science Board as an arm’s-length body to be responsible for the coordination, strategy and direction of forensic science in England and Wales.*
38. *The Forensic Science Board should work with the newly expanded role of the Forensic Science Regulator (see recommendation in Chapter 3), the National Institute for Forensic Science proposed by this report (see recommendation in Chapter 6), and wider stakeholders to create and deliver a new forensic science strategy which focuses on greater coordination and collaboration. The strategy should aim to promote proper understanding of forensic science in the criminal justice system. The Board should also consider levels of funding and the value for money in the forensic science market. The Forensic Science Board should set England and Wales on track to regaining its world-class status in forensic science.*
39. *The Board should be chaired by a retired senior judge with experience of criminal casework. Membership should include the Director of the new National Institute for Forensic Science proposed by this report,*

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42 Written evidence from Cellmark Forensic Services ([FRS0071](#))

43 *Ibid.*

44 Written evidence from Professor Dame Sue Black ([FRS0008](#))

45 Written evidence from FoSciSIG ([FRS0040](#))

*a senior academic, and a senior police officer. The Home Secretary and the Secretary of State for Justice should be jointly accountable to Parliament for the Board.*

## CHAPTER 3: THE FORENSIC SCIENCE MARKET

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### The shape of the current market

40. Some of the most concerning evidence we received was about the state of the forensic science market. The private market is dominated by three large providers, all of which have experienced some form of instability in the last year:
- LGC Forensics, the largest private forensic science provider in the UK forensics market, has been acquired by Eurofins Forensic Services (EFS)
  - Key Forensic Services almost collapsed before being bought by CorpAcq (not a private forensic science provider but a corporate acquisition company), and the police had to pay to keep it operational for three months while outstanding contracted work was completed
  - Orchid Cellmark Ltd (who trade as Cellmark Forensic Services) was acquired in a management buyout from its former US parent company LabCorp.<sup>46</sup>

The market is also served by a number of smaller private forensic science service providers, some of which employ only one or two people.

41. In December 2010 the Government announced the closure of the Forensic Science Service, citing losses averaging £2 million per month as the reason. Following the announcement, the House of Commons Science and Technology Committee conducted an inquiry into the closure. It concluded that the Government did not give “enough consideration to the impact on forensic science research and development (R&D), the capacity of private providers to absorb the FSS’s 60% market share and the wider implications for the criminal justice system”<sup>47</sup> when making the decision and warned of the possibility of serious market instability. They were right.
42. Since the closure of the Forensic Science Service in 2012, certain forms of forensic science analysis are increasingly carried out ‘in-house’ within police forces, especially disciplines like fingerprint analysis and digital forensics. Currently “the forensic marketplace accounts for about 20% of service provision for law enforcement in forensic services”<sup>48</sup> by value, with the remaining 80% of forensic science work conducted by in-house employees of police forces.
43. At the same time, there has been a large reduction in spending on forensic science services. Andrew Rennison, a Commissioner at the Criminal Cases Review Commission and former Forensic Science Regulator, told us that in 2008, “there was probably £120 million being spent on forensic science. That is now down to about £50 million or £55 million”.<sup>49</sup> The total police budget for 2018/19 was £12.3 billion.<sup>50</sup>

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46 Written evidence from Alistair Logan OBE (FRS0080)

47 Science and Technology Committee, *The Forensic Science Service* (Seventh Report, Session 2010–12, HC 855), p 3

48 Q 16 (Chief Constable James Vaughan)

49 Q 91 (Andrew Rennison)

50 National Audit Office (NAO), *Financial sustainability of police forces in England and Wales 2018*, HC 1501, 11 September 2018, p 4: <https://www.nao.org.uk/wp-content/uploads/2018/09/Financial-sustainability-of-police-forces-in-England-and-Wales-2018.pdf#page=6> [accessed 20 March 2019]

44. Between 2012/13 and 2014/15, spending on forensic science services by police fell at the same rate as total police expenditure but “spending on commercial providers fell more sharply, by approximately 29%.”<sup>51</sup>
45. This has contributed substantially to market fragility, which was predicted when it was announced that the Forensic Science Service would be disbanded.<sup>52</sup> A number of witnesses said that the state of the forensic science market in England and Wales was unsustainable and in need of urgent reform.<sup>53</sup>
46. In recent years events such as Key Forensic Services going into administration and Radox Testing Services being suspended from providing toxicology services have produced knock-on effects for other providers and the criminal justice system more broadly. These fluctuations in the market can create problems with “the capture of exhibits, notes, the experts and the computer systems which go with that”,<sup>54</sup> as well as “increased turnaround times”<sup>55</sup> for police forces. Witnesses told us about instances in which forensic tests took up to six months to perform, thus delaying trials.<sup>56</sup> It was suggested by Sir Brian Leveson, President of the Queen’s Bench Division and Head of Criminal Justice, that the pressure in the system when Key Forensic Services was in administration led to “an increased error rate ... although one cannot say anything about cause and effect.”<sup>57</sup>
47. Dr Gillian Tully listed the risks to the criminal justice system of a forensic science provider exiting the market in an uncontrolled way in future:
- “loss of continuity of exhibits;
  - degradation of exhibits (e.g. if electricity were to be cut off);
  - disruption to production of reports for individual cases;
  - lack of capacity in the remaining market;
  - further loss of skills from the profession, particularly among the more experienced staff, some of whom have been made redundant more than once;

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51 Written evidence from NPCC ([FRS0053](#))

52 Science and Technology Committee, *The Forensic Science Service* (Seventh Report, Session 2010–12, HC 855); Additionally, “A report produced by McKinsey & Co for the National Policing Improvement Agency in 2008 identified a series of risks associated with the forensic science market, including lack of stability, lack of investment confidence and slow innovation and supply chain issues, which contributed to uncertainties about the future size and shape of the market. The latter also reflected a lack of clarity about how the market would develop (McKinsey & Co 2008)” from Christopher Lawless, *Forensic Science: A sociological introduction* (Routledge, 2016), p 152

53 See written evidence from Forensic Science Northern Ireland (FSNI) ([FRS0006](#)), Forensic Video Services Ltd ([FRS0010](#)), Danyela Kellett ([FRS0035](#)), NCECJS ([FRS0038](#)), Forensic Equity Ltd ([FRS0039](#)), Mrs Angela Forshaw ([FRS0046](#)), Key Forensic Services Ltd ([FRS0048](#)), Dr Gillian Tully ([FRS0057](#)), Keith Borer Consultants ([FRS0061](#)), EFS ([FRS0063](#)), Metropolitan Police Services (MPS) ([FRS0064](#)), Forensic Access ([FRS0066](#)), University of Edinburgh ([FRS0067](#)), NPCC Transforming Forensics Programme ([FRS0070](#)), Cellmark Forensic Services ([FRS0071](#)), Millington Hingley Ltd ([FRS0075](#)), University of Leicester ([FRS0082](#)), Royal Statistical Society (RSS) ([FRS0086](#)). See also [Q 103](#) (Tom Nelson OBE), [Q 178](#) (Sir Brian Leveson).

54 [Q 34](#) (Adrian Foster)

55 [Q 83](#) (Carolyn Lovell)

56 See, for instance, written evidence from Professor Peter Sommer ([FRS0009](#)), Infra Tech Forensics (Video) Ltd ([FRS0028](#)), and Robert Green OBE ([FRS0031](#)).

57 [Q 178](#) (Sir Brian Leveson)

- loss of records that are not case-specific (e.g. records of training and competence of staff, records of calibration and maintenance of equipment);
  - loss of corporate memory, whereby the terminology and detail enabling case files to be understood and methods re-created are lost; and
  - disruption to defence examination in cases, when equipment used can no longer be inspected.”<sup>58</sup>
48. While there are concerns about the current state of the market, we did not hear convincing arguments in favour of resurrecting the Forensic Science Service. Its loss was regrettable, but some aspects of forensic science provision, such as cost and turnaround time of routine cases, have improved in the last few years. Our recommendations are therefore made in the context of maintaining a mixed market approach.

### **Tendering and procurement**

49. Any consideration of the instability of the forensic science market must take account of the commissioning models and tendering processes. Procurement of forensic services from private providers is largely run by the 43 police forces and their Police and Crime Commissioners in England and Wales. As Carolyn Lovell, Head of Operations for Crime Scene Investigation at Hampshire Constabulary told us, every force is having their budget “restricted and they will be restricted again next year”.<sup>59</sup> She suggested that enforcing price increases for work by private providers would mean that forces would have to “review what we submit and perhaps no longer submit certain aspects of our work to them because we do not have any other financial resources”.<sup>60</sup>
50. Another distinctive feature of the forensic science market is that police forces are essentially the sole customer for private providers in any given region and when they join together in buying forensic services they act like a monopsony “in which the market fails and prices are driven down excessively. The risk of losing the customer becomes an existential issue for the supplier.”<sup>61</sup>
51. We heard that there are two procurement models in the current market and they each exert different pressures.

### *Commoditised procurement*

52. There is a model of procurement which focuses on cost and quick turnaround time. The defining feature of this model is the emphasis on price. David Hartshorne, Managing Director of Cellmark Forensic Services, explained how a few years ago, price “was considered to be about 40% of the evaluation of a tender, now it is 60% and, in some areas, even higher than that.”<sup>62</sup> This emphasis, coupled with a dominant customer, has led to “a 30% or 40% erosion in pricing over six to seven years.”<sup>63</sup>

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58 Written evidence from Dr Gillian Tully ([FRS0057](#))

59 [Q 83](#) (Carolyn Lovell)

60 *Ibid.*

61 Written evidence from Forensic Science Northern Ireland (FSNI) ([FRS0006](#))

62 [Q 72](#) (David Hartshorne)

63 [Q 69](#) (Dr Mark Pearse)

53. Chief Constable James Vaughan told us that the:

“commoditised model has forced the suppliers to a point where they are competing so heavily on price, and the contracts are so big and they come around so infrequently that when they bid for work, there is a fear they will lose the market share and bring their prices right down to, in my view, an unsustainable level.”<sup>64</sup>

54. This has affected some areas of forensic science more than others. Eurofins Forensic Services estimated that there had been a “30–40% reduction in revenues in areas such as drugs, DNA and toxicology. If one takes a longer window we have seen a 70–90% price erosion in some areas since the later [Forensic Science Service] years.”<sup>65</sup>

#### *Managed service procurement*

55. More recently, some police forces have procured forensic science services using a managed service model. This is where “a large provider—and really only the large providers can operate in that space—works very closely with a police force or a police region, and in some cases those regions are 20 police forces”.<sup>66</sup>In this model the police force or forces contract long-term for all the forensic science services they need in return for a fixed price. These contracts can be for up to 10 years, providing long-term stability and certainty for the large provider, but leaves little space for smaller providers, many of which are the only ones able to offer scientific analysis in niche disciplines.

56. The Metropolitan Police Service explained that they have moved “to a commercial partnering arrangement with the private sector entering into a long-term contract, with joint ownership of risk, investment, development and implementation of new science such as rapid DNA analysis and contractual arrangements that recognise the fragility of the market.”<sup>67</sup>

57. A downside to this model is that it leaves “the remaining providers vulnerable and at the mercy of the winning provider hoping they will offer them some subcontracting work; these enormous swings in work provide further uncertainty in the marketplace.”<sup>68</sup>

#### *Terms and conditions of contracts*

58. In addition to the difficulties created by the procurement models, private providers are struggling to cope with some of the terms and conditions attached to contracts with police services. Eurofins Forensic Services told us that “the vast majority of contracts require bidders to sign up to zero inflation over the duration. With a baseline RPI of typically 3%, wage inflation of 1–2% and other increasing costs such as the need to invest in accreditation ... this is challenging.”<sup>69</sup>

59. Despite “suppliers in the [England and Wales] market ... now on the whole delivering services up to ten times quicker than in other parts of the UK and in other European countries”, Eurofins Forensic Services described timeliness requirements in contracts which are “extremely challenging and

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64 Q 16 (Chief Constable James Vaughan)

65 Written evidence from EFS (FRS0063)

66 Q 16 (Chief Constable James Vaughan)

67 Written evidence from Metropolitan Police Service (MPS) (FRS0064)

68 Written evidence from Mrs Angela Forshaw (FRS0046)

69 Written evidence from EFS (FRS0063)

require a disproportionate level of investment to achieve. It is now recognised by many in the sector that a delivery requirement that is linked to [criminal justice system] processes would be much better.”<sup>70</sup>

60. Timeliness penalties in these contracts are delivered via a “service credit regime ... which effectively fine suppliers for late delivery. Whilst there should of course be drivers on suppliers to ensure on-time delivery the current regimes do not reward consistency or reliability and can result in very disproportionate penalties”,<sup>71</sup> which may affect quality.

*Other features of procurement contracts*

61. Another issue which has exacerbated market instability is the timing of police tenders. David Hartshorne told us that “towards the back end of 2016, about 75% of all the police work in the country went out to tender at the same time. It meant that 2017 was particularly difficult.”<sup>72</sup>
62. This was because “before 2006 police forces often tendered as individual forces; regional tendering then became more common (with 5–6 forces bidding together); and then in 2016, 19 (out of 43) police forces tendered their work in a combined tender ... and the bid overlapped with two other very major forensic tenders.”<sup>73</sup>

*Effect of procurement models on smaller and niche service providers*

63. The models of procurement, especially the short-term focused commodity-based procurement, have had a substantial impact on the ability of private providers to offer services in niche disciplines. Stan Brown CBE, Chief Executive of Forensic Service Northern Ireland, explained:

“each sizeable forensic laboratory will have a number of different specialisms, and there is a minimum irreducible size for each specialism below which it is not sustainable. You have to have peer review of every report, for example. They will have to make a decision at a certain point to discontinue a particular specialism. To rekindle a specialism from scratch would take three years, because you have to get the people and train them up to the official competencies, validate your instruments [etc.]”.<sup>74</sup>

64. Our evidence suggests that some specialisms are at risk of dying out because they are no longer sustainable for business purposes. The Knowledge Transfer Network Forensic Science Special Interest Group told us that “physical trace evidence types (such as glass, paint and fibres) that may be of value to the investigation are generally not sent for forensic analysis due to the cost ... This impacts on maintenance of competence in accredited organisations adding to costs, impacting further on the financial position of providers.”<sup>75</sup>

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70 Written evidence from EFS ([FRS0063](#))

71 *Ibid.*

72 [Q 74](#) (David Hartshorne)

73 Written evidence from Cellmark Forensic Services ([FRS0071](#))

74 [Q 103](#) (Stan Brown CBE)

75 Written evidence from FoSciSIG ([FRS0040](#))

65. David Hawksworth CBE, a forensic mycology<sup>76</sup> practitioner, said that this was also the case in his area of expertise: there had been “a reduction of perhaps 5–6 cases per year down to 1–2 or zero over the last decade, which means that it is no longer economic to pay for inclusion in directories of available experts, membership of forensic bodies (e.g. Chartered Society for Forensic Science), or fees for courses on court procedures.”<sup>77</sup>

#### *Options for different procurement models*

66. In order to stabilise the market, procurement models will need to change substantially. Witnesses suggested that the managed service model, which allows for longer term contracts, is preferable because it would “allow for the building of strong relationships within the whole investigative process. It would ensure that the forensic science provider can invest in the development of its staff.”<sup>78</sup> However, the model would need to alter to mitigate against the ‘winner takes all’ effect, which is debilitating to smaller providers and niche disciplines. Radox Testing Service suggested that this could be done by promoting “multiple awards within contracts, ideally directly to suppliers”.<sup>79</sup>
67. To curb further reductions in price, the Metropolitan Police Service suggested bringing in a “nationally agreed minimum cost per analysis. It may be difficult to come to an agreed minimum cost but doing so should ensure that providers do not undercut competitors at the expense of quality.”<sup>80</sup>
68. Radox Testing Services suggested reducing “the weighting of pricing within tender evaluation, to no more than 40%” and introducing “procurement programming to ensure around 20% of contracts are re-tendered and awarded each year.”<sup>81</sup>

#### **Forensic Science Market Regulator**

69. The evidence we have received points to the need for a body to oversee the market and ensure continuity of service provision. Amongst other things, this body could consider whether it would be beneficial to specify the percentage share of the market that should be taken by private companies versus public providers. Rather than establishing a new body, the remit of the Forensic Science Regulator could expand to include this function. To enable this the resources and budget of the Forensic Science Regulator would need to increase. The regulatory body would also need staff with experience of market regulation.
70. Dr Gillian Tully told us that any regulator tasked with overseeing the market would need to be able to “control national spending on forensic science” in

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76 Mycology is used in estimating times of death or events by using known growth rates of fungi, in providing trace evidence, and in locating corpses. It also includes causes of death or illness by fungi poisoning, and fungi as used in biological warfare. See David L. Hawksworth and Patricia E.J. Wiltshire, ‘Forensic mycology: the use of fungi in criminal investigations’, *Forensic Science International*, Volume 206, Issue 1–3 (20 March 2011), pp 1–11: <https://www.sciencedirect.com/science/article/pii/S0379073810003099> [accessed 20 March 2019]

77 Written evidence from Professor David Hawksworth CBE (FRS0090)

78 Q 49 (Professor Niamh Nic Daéid)

79 Written evidence from Radox Testing Services (RTS) (FRS0099)

80 Written evidence from Metropolitan Police Service (MPS) (FRS0064)

81 Written evidence from Radox Testing Services (RTS) (FRS0099)

order to be “effective in securing long-term resilience”. In practice, “this would require that the oversight body:

- had the power to define the minimum level of overall spending on forensic science required to maintain resilience and protect the interests of justice;
- could centrally control the budget for forensic science, i.e. the budget would be “top-sliced” from police and potentially [Legal Aid Agency] budgets rather than being locally delegated to Chief Constables and Police and Crime Commissioners; and
- had statutory power to set an appropriate pricing structure.”<sup>82</sup>

71. While Dr Tully acknowledged that this proposal, especially in relation to centrally controlled spending, “may seem extreme”, she emphasised that “the potential for further major exits from the market and/or loss of a range of disciplines hangs in the balance; continuing to lurch from crisis to crisis is untenable.”<sup>83</sup>

72. *The instability of the forensic science market is a serious risk to the criminal justice system. We recommend that the Forensic Science Regulator’s remit and resources be reformed and expanded to include responsibility for regulating the market.*

73. *The expanded role of the Forensic Science Regulator should review the structure of the market for forensic science in England and Wales and, in particular, the procurement process for commissioning private sector providers alongside provision by police forces. The objective should be to determine a procurement model which balances price, quality and market sustainability; ensures a level playing field between private and public sector providers; avoids undue shocks to the market, such as the clustering of contracts in any one year; and which maintains the capabilities of small providers in niche disciplines.*

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82 Supplementary written evidence from Dr Gillian Tully ([FRS0107](#))

83 *Ibid.*

## CHAPTER 4: ENSURING TRUST IN FORENSIC SCIENCE

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74. For forensic science to contribute effectively to the criminal justice system the science must be trustworthy. Two key components of this are quality standards and training.

### Accreditation

75. The United Kingdom Accreditation Service (UKAS) is the sole accreditation body for forensic services in England and Wales. It is responsible for overseeing the process of a forensic science provider applying for accreditation to ISO 17020 and ISO 17025 standards, the standards that apply to forensic science. UKAS is also responsible for ensuring that accredited providers continue to operate to the expected standards.
76. A number of witnesses criticised UKAS and the quality of its assessors. Radox Testing Services said that “UKAS lack experienced, active forensic practitioners to be used as Technical Assessors within some forensic disciplines ... since July 2015 [there have been 11 site visits and Radox Testing Services] have not experienced a UKAS audit with a UKAS assessor with forensic toxicology practitioner experience of biological specimen drug testing.”<sup>84</sup>
77. Complaints about the quality of UKAS assessors were echoed by witnesses from police forces. Danyela Kellett, Forensic Services Manager at Lancashire Constabulary, told us that “the assessors often do not interpret the standard in the same way and accept methods in one force which are challenged in another.”<sup>85</sup>
78. Alongside UKAS, the Forensic Science Regulator also has responsibility for ensuring the quality of forensic science. They publish codes of practice and conduct for forensic practitioners.<sup>86</sup> Although the code of conduct is short and high level, the code of practice is a lengthy document. Infra Tech Forensics told us that “the larger FS providers such as LGC or KFS may have Quality Assurance/Control departments whose sole purpose is to interpret and help with the implementation of these requirements”. However, the amount of information in the document “has grown to such a degree that forensic practitioners operating as micro companies or sole traders are overwhelmed by the administrative burden when trying to manage these requirements.”<sup>87</sup>

### The place for accreditation: ISO 17020 and ISO 17025

79. ISO 17020<sup>88</sup> and ISO 17025<sup>89</sup> are international standards for accrediting the processes undertaken by a provider when analysing evidence. They do not confer accreditation on individuals working within an accredited organisation

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84 Written evidence from Radox Testing Services (RTS) ([FRS0099](#))

85 Written evidence from Danyela Kellett ([FRS0035](#)). See also written evidence from Mrs Angela Forshaw ([FRS0046](#)).

86 Forensic Science Regulator, *Codes of Practice and Conduct for forensic science providers and practitioners in the Criminal Justice System* (October 2017): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/651966/100\\_-\\_2017\\_10\\_09\\_-\\_The\\_Codes\\_of\\_Practice\\_and\\_Conduct\\_-\\_Issue\\_4\\_final\\_web\\_web\\_pdf\\_2\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/651966/100_-_2017_10_09_-_The_Codes_of_Practice_and_Conduct_-_Issue_4_final_web_web_pdf_2_.pdf) [accessed 12 February 2019]

87 Written evidence from Infra Tech Forensics ([FRS0028](#))

88 ISO/IEC 17020:2012, ‘Conformity assessment—Requirements for the operation of various types of bodies performing inspection’: <https://www.iso.org/obp/ui/#iso:std:iso-iec:17020:ed-2:v1:en> [accessed 25 March 2019]

89 ISO/IEC 17025:2017, ‘General Requirements for the Competence of Testing and Calibration Laboratories’: <https://www.iso.org/obp/ui/#iso:std:iso-iec:17025:ed-3:v1:en> [accessed 25 March 2019]

and, while they go some way to ensuring consistency in analytical processes, they cannot ensure the accuracy of every result of any given examination of forensic materials.

80. Danyela Kellett echoed other witnesses when she expressed doubts about whether ISO 17020 and ISO 17025 are appropriate. While agreeing with the principle of accreditation, she thought that these standards “are not set up specifically for forensic science” and consequently “some aspects of those standards are quite difficult to evidence within a forensic environment and ... sometimes you feel that you are almost performing a box-ticking exercise by having to comply with certain areas that do not seem relevant.”<sup>90</sup>

### *Digital forensics*

81. Opinions differ on the appropriateness of the accreditation regime for digital forensics. Lorraine Turner, Business Development and Technical Director at UKAS, stated her belief that ISO 17020 and 17025 are apt for digital forensics as long as they are correctly interpreted because they test variables such as whether “the organisation has in place a management system, defined policies and processes, competent staff, suitable equipment, suitable reporting mechanisms and appropriate methods.”<sup>91</sup> Mark Stokes, Head of the Digital, Cyber and Communications Forensics Unit at the Metropolitan Police Service, agreed, adding that the “basic principles of ISO 17025 and 17020 are good and firm.”<sup>92</sup>
82. Other digital forensic practitioners disagreed. Garry England, a digital forensic scientist, said:

“This framework has been stubbornly applied, despite more suitable ISO standards being available (ISO 27037, 27041, 27042, 27044 & 27050). Indeed, ISO 27037 is entitled “Guidelines for identification, collection, acquisition, and preservation of digital evidence”. Such standards are uniquely suited to digital forensics. Whilst it is appreciated that these currently only hold the status of ‘guidelines’ it would seem a relatively simple matter for the FSR to mandate compliance in order to achieve accreditation.”<sup>93</sup>

Professor Sommer added that it is unwise to try to apply “the model that works for trace forensics” to “situations where it does not work”,<sup>94</sup> such as digital forensics.

### *Effect on small and niche providers*

83. Accreditation to ISO standards is not compulsory, but there is increasing pressure for work to be commissioned only from accredited providers. The Forensic Science Regulator would like ISO 17025 to be mandatory for all providers of forensic services.<sup>95</sup>
84. While many supported initiatives to raise quality standards and build trust in forensic science, witnesses told us about the prohibitive cost of obtaining

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90 [Q 84](#) (Danyela Kellett)

91 [Q 172](#) (Lorraine Turner)

92 [Q 128](#) (Mark Stokes)

93 Written evidence from Mr Garry England ([FRS0076](#))

94 [Q 129](#) (Professor Peter Sommer)

95 Written evidence from Dr Gillian Tully ([FRS0057](#))

accreditation and the likely effects of making it mandatory on small and niche providers.

85. Keith Borer Consultants explained that the accreditation process “requires that every scientific activity be individually assessed, irrespective of its complexity and similarity to other processes already within a workflow. This makes accreditation prohibitively expensive for any small organisation offering a wide range of scientific services.”<sup>96</sup> Forensic Video Services Ltd told us that they are already aware of “some small businesses ceasing trading or changing the scope of their provision away from the legal sector on grounds of affordability and the onerous paperwork and documentation practices involved.”<sup>97</sup>
86. Infra Tech Forensics (Video) Ltd outlined the costs of obtaining accreditation:
- “The March 2017 meeting of the Forensic Imagery Analysis Group at KFS in Coventry was attended by the FSR. A colleague stated that he had “set aside £14,000 for accreditation costs.” This figure was not refuted by the FSR. The continuation costs for re-accreditation in year 2 are estimated at half of the initial cost.”<sup>98</sup>
87. In addition, because of the diversity of forensic science disciplines, there are some practitioners who are called on to work on cases only once or twice a year. Dr Karl Harrison, a lecturer in Forensic Archaeology at the Cranfield Forensic Institute, Cranfield University, cautioned that “if their organisation or university is suddenly required to invest in the production of standard operating procedures that would lead them towards an ISO qualification, that will potentially freeze a lot of specialists out of the market.”<sup>99</sup>
88. John Welch, a forensic scientist, highlighted that the loss of small or niche providers due to compulsory accreditation was likely to have a greater adverse effect on defendants needing to commission forensic testing because small companies “are the main sources of forensic science for defendants in criminal cases. Compulsion will make it much more difficult for defendants to have prosecution forensic evidence checked and challenged.”<sup>100</sup> This could lead to miscarriages of justice since, as Garry England explained, “the absence of these providers could lead to an inappropriately low level of probity being applied to evidence produced by law enforcement. The lack of probative challenge to this evidence has the potential to result in erroneous convictions.”<sup>101</sup>
89. While it is troubling that the defence may be adversely affected by mandatory accreditation, the Forensic Science Regulator explained:
- “I have carefully considered whether there could or should be some form of exemption from compliance with the standards for small businesses ... the impact of poor-quality forensic science on any particular case is not proportionate to the size of the company delivering it. Considering the users of forensic science, from police investigators to prosecutors, counsel and courts, should there be a lower expectation of quality when

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96 Written evidence from Keith Borer Consultants ([FRS0061](#))

97 Written evidence from Forensic Video Service Ltd ([FRS0010](#))

98 Written evidence from Infra Tech Forensics (Video) Ltd ([FRS0028](#))

99 [Q 2](#) (Dr Karl Harrison)

100 Written evidence from Mr John Welch ([FRS0034](#))

101 Written evidence from Mr Garry England ([FRS0076](#))

it is delivered by a small company? Surely not, nor from the perspective of a complainant or a suspect.”<sup>102</sup>

Dr Tully went on to say that, despite this, she was working with UKAS and the Chartered Society of Forensic Sciences to “determine whether the costs of achieving the same quality standards could be reduced for small businesses. This work is at pilot stage, and it remains to be seen what savings can be made.”<sup>103</sup>

90. ***The Forensic Science Regulator should work with UKAS to find a proportionate way to reduce costs of accreditation for niche and smaller private providers. Exemptions from accreditation should exist for providers using new or non-standard techniques which could not yet be accredited, but the court should be made aware of this.***
91. ***We see a clear benefit in ensuring that most forensic science providers are accredited to the appropriate ISO standards. The Forensic Science Regulator should review the current regulation framework and make any necessary changes to ensure that it promotes good practice.***

#### **Accrediting individuals**

92. While accreditation from UKAS may give a level of confidence in a forensic science provider, there is no accreditation scheme or certification for individual practitioners and expert witnesses. Some disciplines, particularly those that have a forensic science element but are primarily non-forensic science, have professional bodies which may accredit practitioners.<sup>104</sup> However, Professor Tim Thompson, Professor of Applied Biological Anthropology at Teesside University said that even within these disciplines, “different professional bodies have different mechanisms by which they do that, so there is no consistency across the different disciplines.”<sup>105</sup>
93. The dangers of not accrediting individuals were explained by Forensic Video Services Ltd:
- “If you can convince a judge that you are ‘expert’ in your field, your evidence may be admitted. This can result in unqualified experts offering flawed opinions, or in having a qualified expert undermined by an unqualified one because of their being given the opportunity to offer opposing opinion to the jury by the judge. This is exacerbated by the fact that a number of forensic working groups under the umbrella of the Chartered Society of Forensic Sciences undertake no scrutiny or vetting of their members’ qualifications before granting membership<sup>106</sup> (membership of such a body can easily be misconstrued as expertise when read out to a jury).”<sup>107</sup>

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102 Written evidence from Dr Gillian Tully ([FRS0057](#))

103 *Ibid.*

104 See, for instance, written evidence from Forensic Geoscience Group ([FRS0012](#)), Institute of Traffic Accident Investigators ([FRS0023](#)), and Dr Anna Williams and Professor John Cassella ([FRS0024](#)).

105 [Q 8](#) (Professor Tim Thompson)

106 Dr Anya Hunt, the Chief Executive of the Chartered Society of Forensic Science confirmed that this was the case, though the Society hoped to provide accreditation in the longer term.

107 Written evidence from Forensic Video Services Ltd ([FRS0010](#))

94. The Serious Fraud Office argued that this was an issue that was likely to become more pressing as digital evidence became more ubiquitous in criminal trials. The “provenance and integrity of material obtained from digital devices is a key area ... Expert evidence should therefore have some form of regulation or a mechanism by which agreed criteria or standards are adhered to.”<sup>108</sup>
95. Sir Brian Leveson agreed that it was important for courts to have confidence in the experts appearing before them. He explained that judges “issue judgments that specifically undermine the expertise that was said to have been correct” but that was then disproved through “rigorous forensic analysis.”<sup>109</sup> However, the onus was on the expert, when giving evidence in future, “to say, “Well, actually, I was not believed on this area of expertise for this reason””.<sup>110</sup> There is little evidence to show whether experts who have been criticised in the past admit to that fact when subsequently giving evidence before a different judge.
96. Accreditation for individuals is not straightforward. Forensic science relies not only on accurate and reproducible detection and analysis of relevant materials, but also on evaluative interpretation of those materials in a specific context. Dr David Schudel told us that it “is very difficult to accredit an opinion. You can have two people working at the same accredited lab using the same methods, and they can have a difference of opinion because it is based on individual education, training and experience as well as what information they have seen.”<sup>111</sup>
97. Dr Tully explained some of the practical difficulties of a system of individual accreditation. While she audited each forensic pathologist on the Register of Forensic Pathologists, which had led to improvements in standards, the scheme was “costly, both in terms of the annual audit and the costs of removing a practitioner from the Register. The approximate cost of removing a practitioner from the Register was an initial c. £500,000 tribunal, which could be followed by legal challenges.”<sup>112</sup> Dr Tully thought that the “system works well for forensic pathology because the number of practitioners is low (there are currently c. 35 pathologists on the Register)”; she did not think it would be feasible “to scale up to thousands of forensic science practitioners”.<sup>113</sup>
98. ***While we are not recommending an accreditation process for individual practitioners of forensic science, an independent tribunal mechanism should be established within the Forensic Science Regulator with the power to prevent individuals from providing expert testimony in court where the individual has been found to have presented misleading or insufficiently evidenced opinion. This debarment should apply until the tribunal is satisfied that the individual has demonstrated their competence to resume giving expert testimony. The Regulator should also have powers to issue fines and improvement notices to individuals who do not deserve debarment and those individuals should have the right to appeal to the tribunal.***

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108 Written evidence from Serious Fraud Office ([FRS0029](#))

109 [Q 178](#) (Sir Brian Leveson)

110 *Ibid.*

111 [Q 118](#) (Dr David Schudel)

112 Written evidence from Dr Gillian Tully ([FRS0057](#))

113 *Ibid.*

99. *The Forensic Science Regulator should also maintain a register of forensic science practitioners who have been debarred from giving evidence in court.*

### Accreditation of police forces

100. The take up of accreditation is patchy across forensic science. While most large private providers are accredited to the ISO standards because they need to be able to win police tenders, many police forces have not been accredited “in the full range of disciplines within the timeframes set by the Forensic Science Regulator”.<sup>114</sup>
101. We heard a number of reasons for these missed deadlines. Danyela Kellett attributed it, at least in part, to the Forensic Science Regulator’s lack of mandatory powers, “because there has not been any compelling driver to get them, unlike for the providers who had to have accreditation to be able to enter the tendering process.”<sup>115</sup>
102. Carolyn Lovell explained that the timing of the accreditation was challenging because it occurred at the same time as “austerity measures” which “led to a fewer staff numbers ... Operational demand is up and as such we are placing both demands on the same staff at the same time.”<sup>116</sup>
103. Police budgets have been reduced over the last few years. The National Police Chiefs’ Council told us that “Chief Constables have carefully balanced and allocated scarce and reducing resources to the threats and risks causing the greatest harm in their communities, aligned to priorities set in local Police and Crime Plans.”<sup>117</sup> In that context, accreditation for forensic processes is, perhaps unsurprisingly, not always accorded priority status.
104. Chief Constable James Vaughan explained that the lack of individual accreditation had been exacerbated by the siloed nature of policing in England and Wales. This meant that police forces had been trying to gain accreditation in “43 different ways. When you have a small capability and you try to do it disparately, you make slow progress”.<sup>118</sup> One of the aims of the Transforming Forensics programme is to help forces to meet all the requirements for accreditation by 2020. However, this will be effective only if the Transforming Forensics programme is able to achieve buy-in from all 43 polices forces.

### Forensic Science Regulator

105. The post of Forensic Science Regulator was created in 2008. The role is sponsored by the Home Office, but the regulator is an independent public appointee who works 3.75 days per week (0.75FTE). The regulator is assisted by three civil servants with scientific training. The Home Office lists the regulator’s responsibilities as:
- identifying the requirement for new or improved quality standards;
  - leading on the development of new standards; and

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114 [Q 16](#) (Chief Constable James Vaughan)

115 [Q 85](#) (Danyela Kellett)

116 [Q 84](#) (Carolyn Lovell)

117 Written evidence from NPCC ([FRS0053](#))

118 [Q 16](#) (Chief Constable James Vaughan)

- where necessary, providing advice and guidance so that providers of forensic science services can demonstrate compliance with common standards.<sup>119</sup>

Despite calls for the regulator to be given statutory powers and assurances from the Government since 2013 that they would be, the regulator still has no mandatory powers.

106. Almost all our witnesses were clear that the Forensic Science Regulator should be given statutory powers in order to be effective in raising standards. We heard a number of suggestions for powers they should be given, including:

- “powers for the Secretary of State to create standards through secondary legislation to speed things up”<sup>120</sup>
- “powers to advise the Legal Aid Agency to not authorise a company or practitioner if under investigation for irregularities”<sup>121</sup>
- powers to “accredit or certify courses of professional development for members or stakeholders of the criminal justice system”<sup>122</sup>
- “power to close a forensic science delivery organisation for failing to meet the accepted standards”<sup>123</sup>
- “power to rescind accreditation in appropriate circumstances”<sup>124</sup>
- “power to inspect, at no notice, a previously accredited organisation”<sup>125</sup>
- power “to actively mediate in disputes in relation to accreditation status.”<sup>126</sup>

Many agreed that Chris Green MP’s private member’s bill<sup>127</sup> was a good start. It would allow the regulator to “investigate and take enforcement action in relation to forensic science activities carried on in a way that creates a substantial risk of adversely affecting any investigation, or impeding or prejudicing the course of justice in any proceedings”.<sup>128</sup>

107. The Chartered Society of Forensic Science told us that the lack of statutory powers “sends out completely the wrong message regarding important matters concerning forensic science and practice, particularly when regulators in other areas in Government do hold such powers.”<sup>129</sup>

108. It is hard to understand why, despite Government assurances since 2012 that statutory powers would be forthcoming,<sup>130</sup> the Forensic Science Regulator still lacks powers they need. The Rt Hon Nick Hurd told us that “the powers

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119 Forensic Science Regulator, ‘About us’: <https://www.gov.uk/government/organisations/forensic-science-e-regulator/about> [accessed 5 February 2019]

120 Q 94 (Andrew Rennison)

121 Written evidence from Infra Tech Forensics (Video) Ltd (FRS0028)

122 Written evidence from Professor Wolfram Meier-Augenstein (FRS0032)

123 Written evidence from EFS (FRS0063). See also written evidence from Metropolitan Police Service (MPS) (FRS0064) and Mr Garry England (FRS0076).

124 Written evidence from Mr Garry England (FRS0076)

125 *Ibid.*

126 *Ibid.*

127 [Forensic Science Regulator Bill](#) [Bill 180 (2017–19)]

128 [Explanatory Notes to the Forensic Science Regulator Bill](#) [Bill 180 (2017–19)-EN], p 2

129 Written evidence from The Chartered Society of Forensic Sciences (FRS0025)

130 Q 94 (Andrew Rennison)

of the regulator need to be put on a statutory basis. I have committed to do that at the Dispatch Box. In practical terms, our mechanism for that is a private member's bill. We have a private member—Chris Green—who is keen to take it forward.”<sup>131</sup> However, it is clear that a private member's bill which still has not received its second reading in the House of Commons will not be passed before the end of this session. The minister said that “if that route feels hopeless, we will resort to primary legislation and government business”<sup>132</sup>.

109. *Since 2012, the Government has given assurances that statutory powers needed by the regulator would be forthcoming but has taken no action. We consider that seven years is an embarrassing time to delay legislation, particularly as time has been found for several other Home Office Bills. The Forensic Science industry is in trouble; such action is now urgent. The Government should introduce statutory powers for the Forensic Science Regulator. Private members' bills cannot be relied on to do this. The Government should demonstrate its commitment to this issue by introducing a Government bill giving the Forensic Science Regulator the following properly funded statutory powers:*

- *The power to issue improvement notices and fines (see para 98).*
- *The power to prevent individuals from providing expert testimony to courts with a corresponding appeals process (see para 98).*
- *The power to investigate a forensic science provider and take enforcement action.*
- *The power to rescind a forensic science provider's accreditation.*
- *The power to inspect, without notice, accredited forensic science providers.*

### **Skills and training**

110. It is important not only to train the next generation of forensic scientists but also to provide ongoing development opportunities for practitioners.
111. Routes into forensic science are varied, with no clearly established paths to a career as a forensic science practitioner. Ongoing training for forensic scientists is also varied, with police forces and private providers having to organise training and development of their staff.
112. David Tucker, Faculty Lead for Crime and Criminal Justice at the College of Policing, told us that the College of Policing had ceased delivering training in forensic science because “many forces were not taking up our forensic training delivery. Those that were found that our products were insufficiently targeted at their particular need.”<sup>133</sup> However, this has left a void in training provision for in-house forensic scientists. It was the consistent view of in-house (police) practitioners who gave evidence that there “should be national oversight for training, probably by the College of Policing or the Chartered

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131 [Q 224](#) (Nick Hurd MP)

132 *Ibid.*

133 [Q 88](#) (David Tucker)

Society for Forensic Sciences. Forensic Scientists from all disciplines and for all organisations should be required to have consistent and accredited training and there should be a register of authorised practitioners.”<sup>134</sup>

113. At a time when police budgets are constrained it is neither practical nor realistic to expect each police force to invest adequately in forensic science training.<sup>135</sup> The same is true for private forensic science providers, many of which, as outlined in Chapter 3, are operating at the limit of profitability.
114. The situation cannot continue. We heard worrying evidence about the expertise of forensic scientists. The Leverhulme Research Centre for Forensic Science told us that they did not believe that:

“forensic scientists in general are sufficiently well trained in basic numeracy, the foundations of statistical and probabilistic analysis and in how to use data to support or refute a variety of competing propositions with the probable exception of DNA evidence. Neither are they well trained in how to undertake research or in some instances, differentiate good quality scientific research from poor quality work.”

They identified a further gap in practitioners’ training: “Forensic scientists are also ... not particularly well trained in the legal framework and in the expectations that the courts have in terms of the requirements of being expert witness”.<sup>136</sup>

115. This lack of training, coupled with the loss of expertise in some forensic science disciplines (see paras 63–65 in Chapter 3), could further destabilise the provision of forensic science services in England and Wales.
116. ***The Forensic Science Board, with input from the College of Policing and the Chartered Society of Forensic Sciences, should develop a strategy for the ongoing training of all forensic science practitioners, with a particular focus on maintaining competence in niche disciplines and providing expert evidence in a legal setting.***

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134 Written evidence from Danyela Kellett ([FRS0035](#)). See also [Q 88](#) (Carolyn Lovell).

135 Written evidence from the Metropolitan Police Service (MPS) ([FRS0064](#))

136 Written evidence from Leverhulme Research Centre for Forensic Science ([FRS0079](#))

## CHAPTER 5: THE USE OF FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM

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### Discrepancies between prosecution and defence provision

#### *Legal aid*

117. Legal aid rates have led to difficulties for defendants in criminal cases commissioning forensic tests and experts. The Legal Aid Agency requires three quotes for forensic experts to be obtained and the reasons why forensic testing is necessary. It will then decide if testing is justified and will normally authorise the cheapest of the three quotes obtained.
118. Dr David Schudel told us that the presumption in favour of the cheapest quote by the Legal Aid Agency “is regardless of quality and whether it is even fit for purpose ... More fundamentally, for a lot of the work we do, such as DNA, fingerprints and the digital arena, the legal aid rate now is less than it was in 1999. So, we are really struggling.”<sup>137</sup> Dr Anya Hunt, the Chief Executive Officer of the Chartered Society of Forensic Sciences, thought this lack of focus on quality sent a poor message about the need for trustworthy and accredited practitioners to be providing forensic expertise.<sup>138</sup>
119. The requirement to justify why forensic science evidence needs to be challenged requires some expertise by the lawyer, as explained by Professor Carole McCartney, from the School of Law at Northumbria University:
- “You might just know that there is DNA involved in the case, but in order to interrogate that and get beyond simply “There is a DNA match in this case” you need to understand what that means, what its significance is and whether you need to consult an expert. However, if you cannot demonstrate to the Legal Aid Agency that there is something challengeable there that needs to be investigated, then there is a chicken-and-egg situation: you have to have some expertise to be able to demonstrate that you need legal aid to go and get yourself a defence expert.”<sup>139</sup>
120. Chris Henley QC, Chair of the Criminal Bar Association, told us of an experience in which a defendant “could not get the funding for a DNA expert from the Legal Aid Agency, so in the end, on a prayer, she called the author of a textbook, who agreed to do it for nothing.”<sup>140</sup> Dr Karl Harrison added that he had “been commissioned by the police, by prosecuting authorities something like 160 times in my career and I have been commissioned by defence counsel three times. This reflects the level of funding that is available to challenge specialist forensic evidence.”<sup>141</sup>
121. Paul Harris, Senior Partner at Edward Fail, Bradshaw & Waterson Solicitors, explained that these issues with legal aid had created a discrepancy not just between the defence and prosecution, but between privately funded and legally aided client.<sup>142</sup>

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137 [Q 117](#) (Dr David Schudel). Dr Schudel represented Keith Borer Consultants whose work is mostly for the defence.

138 [Q 117](#) (Dr Anya Hunt)

139 [Q 57](#) (Professor Carole McCartney)

140 [Q 38](#) (Chris Henley QC)

141 [Q 7](#) (Dr Karl Harrison)

142 [Q 134](#) (Paul Harris)

122. Lucy Frazer QC MP said that “legal aid should be available, as with any disbursement, if there is a sufficient benefit to the client in the case in the instruction of a forensic expert report and the cost of the expert is reasonable. Thus legal aid should be available for the forensic expert.”<sup>143</sup> It is clear that these rules are not always being applied fairly or consistently.
123. *Cuts to legal aid have affected the ability of defendants to access forensic expertise. We recommend that the Legal Aid Agency liaise with the market-regulation arm within the expanded role of the Forensic Science Regulator to set new pricing schemes, properly funded by the Ministry of Justice, for forensic testing and expert advice for defendants.*

### Understanding of forensic science in the criminal justice system

124. We have considered how forensic science is used in criminal cases and how science evidence is understood and interpreted by legal professionals. There is a wide variety of forensic science evidence that can be admitted as evidence in criminal cases. Depending on the case, there can be different requirements for science evidence ranging from attributing the ‘source’ of forensic material (e.g. the identity of a person from a DNA profile) to reaching conclusions about the activities that led to the generation and/or transfer of material (e.g. how and when the DNA was transferred and the relevance of its presence in a particular location or on a specific item). There is a need for consistent interpretation by judges and lawyers of what the evidence means in a specific case to ensure the fair and consistent application of the law.

### Lawyers and judges

125. Our evidence showed a mixed level of understanding of scientific issues by lawyers and judges. Sarah Whitehouse QC, a Barrister at 6KBW, told us that “the general levels of understanding among the judiciary and the Bar are very good, because they are adept at absorbing new scientific ideas and concepts quite quickly.”<sup>144</sup> However, Dr Gillian Tully said that “the understanding of forensic science amongst lawyers and judges appears, from transcripts and judgments, to be variable. Judgments have on occasion demonstrated a lack of understanding of the process of scientific reasoning”.<sup>145</sup> Forensic science is constantly developing; this can lead to difficulties for legal professionals in understanding the complex forensic science evidence presented, and its limitations.
126. Problems can arise due a lack of familiarity with a specific type of evidence. Angus Marshall, Director and Principal Scientist at n-gate Ltd, told the committee of an experience presenting digital forensic evidence to legal professionals:

“I find that prosecutors, in particular, do not seem to have time to properly read my reports, or to consult with me in order to fully understand the evidence I have presented. Indeed, it has been the case that during the presentation of evidence ... , I have had to disagree with and correct a member of counsel who has completely misunderstood my evidence because his understanding of the technical issues was based on

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143 [Q 231](#) (Lucy Frazer QC MP)

144 [Q 133](#) (Sarah Whitehouse QC)

145 Written evidence from Dr Gillian Tully ([FRS0057](#))

incorrect assumptions and personal experience of a completely different, but superficially similar, system.”<sup>146</sup>

127. Difficulties can also be caused by the inherent scientific complexity that exists when dealing with uncertainty. UCL Centre for the Forensic Sciences highlighted a recent study of 108 laboratories across the USA in which the laboratories were asked to interpret a series of mixed DNA profiles.<sup>147</sup> “For one of the complex mixtures in that study, 78 laboratories (69%) incorrectly included a donor who was not present in the mixed profile. Seven laboratories correctly excluded this donor (6%), but the reasons for the correct exclusion varied.”<sup>148</sup> The evidence presented to the court will not always make it clear how a DNA match was obtained from a complex mixture. Advocates need to have the knowledge to bring these differences out during their examination of witnesses.
128. An incorrect understanding of probability by legal professionals can lead to evidence being given more weight than it deserves. Professor Norman Fenton from the Alan Turing Institute explained the dangers of evidence being wrongly interpreted in the courtroom:

“While some common errors of probabilistic reasoning are well known and even recognised as dangerous by the judiciary (such as the prosecutor’s fallacy<sup>149</sup>), most are not. I believe injustices are occurring widely because of misunderstandings about the probative value of forensic match evidence. Specifically: what can we reasonably infer if there is evidence that some forensic ‘trace’ (which could be DNA, a fingerprint, a shoe mark, a fibre, etc) has a profile that matches the profile belonging to a particular person? It is widely (but wrongly) assumed that if the ‘trace’ is DNA or a fingerprint then the profile match is equivalent to an identification, i.e. that the trace must have come from the person. However, because many forensic traces from crime scenes are only ‘partial’ and may be subject to various types of contamination, the resulting ‘profile’ is not sufficient to ‘identify’ the person; many people would have a partial profile that matches.”<sup>150</sup>

129. A further difficulty is the challenge of providing clear evaluative interpretations of what the evidence means to a court. A number of witnesses highlighted the gaps that exist in being able to deliver evidence-based interpretations of forensic science evidence.<sup>151</sup> For instance, without better empirical data about transfer and persistence of DNA, interpretations of results by experts in court must remain subjective.

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146 Written evidence from Mr Angus Marshall (FRS0019)

147 JM Butler, M.C. Kline, M.D. Coble, ‘NIST interlaboratory studies involving DNA mixtures (MIX05 and MIX13): Variation observed and lessons learned’, *Forensic Science International: Genetics*, Volume 37 (November 2018), pp 81–94: [https://www.fsigenetics.com/article/S1872-4973\(18\)30248-5/fulltext](https://www.fsigenetics.com/article/S1872-4973(18)30248-5/fulltext) [accessed 27 March 2019]

148 Written evidence from UCL Centre for the Forensic Sciences (CFS) (FRS0041)

149 Norman Fenton and Martin Neil, ‘Avoiding Legal Fallacies in Practice using Bayesian Networks’, *Australian Journal of Legal Philosophy* 36, 114–151 (29 June 2011): [https://bayes-knowledge.com/attachments/article/50/\(Fenton%20and%20Neil%202011\)%20Avoiding%20Legal%20Fallacies%20in%20Practice%20Using%20Bayesian%20Networks.pdf](https://bayes-knowledge.com/attachments/article/50/(Fenton%20and%20Neil%202011)%20Avoiding%20Legal%20Fallacies%20in%20Practice%20Using%20Bayesian%20Networks.pdf) [accessed 27 March 2019]

150 Written evidence from Alan Turing Institute (FRS0030)

151 See written evidence from NCECJS (FRS0038), UCL Centre for the Forensic Sciences (CFS) (FRS0041), James Hutton Institute (FRS0042), Lancashire Forensic Science Academy (FRS0054), and Dr Gillian Tully (FRS0057).

130. There is statutory guidance for lawyers and judges regarding expert witnesses set out in the Criminal Procedure Rules<sup>152</sup> and the Criminal Practice Direction<sup>153</sup> which must be read together; the reason for two documents is historical and technical; they have been drafted together and approved by the same body. They set out the following requirements if expert evidence is to be admitted in a trial:
- Expert evidence is admissible only if the court is satisfied that there is a sufficiently reliable scientific basis for the evidence to be admitted.<sup>154</sup>
  - Experts owe their duty to the court. This makes clear that experts do not owe a duty to their appointing party and must make proper disclosure. The duty has been strengthened from 1 April 2019.
  - Expert reports must contain specific matters and must be exchanged well in advance of the trial.
  - A pre-trial meeting between the experts must take place, unless the judge decides otherwise.
131. In 2017 the Royal Society and the Royal Society of Edinburgh produced, in conjunction with the judiciary in England and Wales and Scotland, the first two in a proposed series of primers written by leading scientists and judges to assist judges in handling forensic scientific evidence by providing an easily understood and accurate position on different types of forensic science evidence. The two primers provide overviews of forensic DNA analysis<sup>155</sup> and forensic gait analysis.<sup>156</sup> Primers on further topics are planned. While the reception to these has been positive, the initiative has received no Government support. While the project has demonstrated the utility and importance of what it set out to do, it needs proper financial support if it is to provide broad coverage within a sufficiently rapid timescale for the project to be the source of ongoing, balanced and accessible advice on forensic science evidence put before the courts.
132. The Inns of Court College of Advocacy, in conjunction with the Royal Statistical Society, has produced a guide for barristers on statistics and probability, and how to understand statistical evidence in court.<sup>157</sup> The Inns of Court College of Advocacy has also produced a guide to the preparation,

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152 The Criminal Procedure Rules—October 2015 as amended April 2018, *Part 19, Expert Evidence*: <http://www.justice.gov.uk/courts/procedure-rules/criminal/docs/2015/crim-proc-rules-2015-part-19.pdf> [accessed 4 March 2019]

153 Criminal Practice Directions—October 2015 as amended November 2016, April 2017, October 2017, April 2018 and October 2018, *Criminal Practice Directions 2015 Division V*: <http://www.justice.gov.uk/courts/procedure-rules/criminal/docs/2015/crim-practice-directions-V-evidence-2015.pdf> [accessed 4 March 2019]

154 The Practice Direction sets out the factors enumerated by the Law Commission in its 2011 Report. Consideration of the factors should ensure a thorough examination of the underlying scientific reliability of the evidence.

155 The Royal Society, *Forensic DNA analysis: a primer for courts* (November 2017): <https://royalsociety.org/~media/about-us/programmes/science-and-law/royal-society-forensic-dna-analysis-primer-for-courts.pdf> [accessed 14 February 2019]

156 The Royal Society, *Forensic gait analysis: a primer for courts* (November 2017): <https://royalsociety.org/~media/about-us/programmes/science-and-law/royal-society-forensic-gait-analysis-primer-for-courts.pdf> [accessed 14 February 2019]

157 The Inns of Court College of Advocacy (ICCA), Royal Statistical Society (RSS), *Statistics and probability for advocates: Understanding the use of statistical evidence in courts and tribunals* (2017): <https://www.icca.ac.uk/images/download/expert-evidence/statistics-and-probability-for-advocates-booklet-guide-icca-rss.pdf> [accessed 15 February 2019]

admission and examination of expert evidence.<sup>158</sup> These are potentially useful resources but it is not clear how widely used they are by legal practitioners.

133. Aside from criminal practice directions and primers, there are few other resources for judges and lawyers, and no formalised training in forensic science. Dr Christopher Lawless, Associate Professor at Durham University, suggested this could be rectified by incorporating elements of scientific method into undergraduate law programmes.<sup>159</sup>

134. Professor David Ormerod QC, Chair in Criminal Law at UCL and Law Commissioner for England and Wales, suggested

“that there is scope for a compulsory element to the newly qualified practitioners scheme. Everyone who qualifies as a barrister or solicitor has to undertake continuing professional development ... There is an opportunity there for a compulsory module relating to forensic science.”<sup>160</sup>

Similar training could be provided for judges<sup>161</sup> through the Judicial College.

135. *The new Forensic Science Board should have ultimate responsibility for ensuring ongoing guidance to the judiciary and the legal professional about the accurate scientific position on the main types of forensic science. Although this must be a matter for the Board, there is clear benefit in continuing the work that has produced primers on key topics, albeit at an increased pace and with a broader scope. They should be responsible for enabling dialogue and sharing of best practice, and responding to new developments as they arise.*

136. *We recommend that all advocates practising in the criminal courts should, as part of their continuing professional development, be required to undertake training in the use of scientific evidence in court and basic scientific principles such as probability, scientific inference and research methods.*

#### *The ‘CSI effect’*

137. There is concern about how juries treat forensic evidence. The Scottish Police Authority described the ‘CSI effect’ in juries as “primarily shaped by the media and television” and “not based in anyway in reality”.<sup>162</sup>

138. Sarah Whitehouse QC told us that “juries do not always understand that forensic science is not a magical golden key and that they must slot the scientific evidence they hear into the context of the other evidence in the case. Too often they ... think that DNA will solve everything.”<sup>163</sup> This was supported by His Honour Judge Wall QC, a Circuit Judge, who told us the ‘CSI effect’ “has led to juries constantly asking questions in a trial as to whether something has been submitted for testing, and if not, why not. It also leads ... to them having a great deal of confidence in the scientific

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158 ICCA, *Guidance on the preparation, admission and examination of expert evidence* (2019): <https://www.icca.ac.uk/images/download/expert-evidence/Expert-Guidance-final-copy-with-cover-2019.pdf> [accessed 19th February 2019]

159 Q 23 (Dr Christopher Lawless)

160 Q 56 (Professor David Ormerod QC)

161 Written evidence from Professor Wolfram Meier-Augenstein (FRS0032)

162 Written evidence from Scottish Police Authority (FRS0084)

163 Q 133 (Sarah Whitehouse QC)

evidence and ... putting more emphasis on its importance than it really has in any trial.”<sup>164</sup>

139. There is limited published evidence on how the portrayal of forensic science in the media affects juries’ perceptions of forensic science. However, the anecdotal evidence that we heard suggests that it is an issue that needs to be considered.
140. Further research is necessary. One suggestion for counteracting the ‘CSI effect’, put to us by Dr Itiel Dror, Senior Cognitive Neuroscience Researcher at UCL, was for the jury to be shown a video where there was “DNA evidence, fingerprint evidence, giving the reality and the strengths of the forensic domain”.<sup>165</sup>

### Streamlined Forensic Reporting

141. We heard evidence which raised concerns about the use of Streamlined Forensic Reporting (SFR) in court which were first introduced in 2012. The purpose was, according to the Crown Prosecution Service that SFR “seeks to reduce unnecessary costs, bureaucracy and delays in the criminal justice system. The process takes a more proportionate approach to forensic evidence through the early preparation of a short report that details the key forensic evidence the prosecution intend to rely upon.” This is aimed at achieving “early agreement with the defence on forensic issues but where this cannot be achieved in the first instance, to identify the contested issues.”<sup>166</sup>
142. Sarah Whitehouse QC thought that SFR could “save a great deal of time and money and ... allow early engagement by the defence in obtaining their own forensic experts”.<sup>167</sup>
143. It is clear that problems arose in relation to the use of SFRs. The main issue seemed to be that the initial SFR report (SFR1) was being used at trial instead of the more comprehensive SFR2. As a result, the Senior Presiding Judge of England and Wales issued firm guidance in March 2017 which explained that SFR1 “involves the provision of a short report, written by the relevant provider, which gives the initial key findings. This is not a witness statement nor an expert’s report, which would require the level of detail specified in CrimPR r19.3(3).”<sup>168</sup> It was therefore not admissible evidence at a trial. The guidance explained that the SFR was to be used only to see if the prosecution case on the forensic investigation as set in the SFR1 was agreed by the defence; if it was not, then the SFR1 was not to be used in court, but a SFR2 or a full report should be used. The guidance explained that in contrast, “SFR2 evidence is prepared by the relevant person or expert, and it is presented in witness statement format with an expert’s declaration under CrimPR 19.4(j) and the 2015 Criminal Practice Directions 19B, if

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164 Q 177 (His Honour Judge Wall QC)

165 Q 28 (Dr Itiel Dror)

166 CPS, *Streamlined Forensic Reporting Guidance and Toolkit* (2017): <https://www.cps.gov.uk/legal-guidance/streamlined-forensic-reporting-guidance-and-toolkit> [accessed 14 February 2019]

167 Q 140 (Sarah Whitehouse QC)

168 Judiciary of England and Wales, Better Case Management (BCM) Newsletter, *Streamlined Forensic Reporting*, Issue 12, March 2017, p 2: <https://www.criminalbar.com/wp-content/uploads/files/papers/170331173424-bcmnewsletterissue12.pdf> [accessed 26 February 2019]

required.”<sup>169</sup> The guidance should have resolved the issues, but we heard some evidence that it had not.<sup>170</sup>

144. Adrian Foster, Chief Crown Prosecutor at the Crown Prosecution Service, accepted that this was a problem in some cases and that “some prosecutors, judges and defence counsel are asking for the witness who created the SFR1 to come to court. That is the wrong person. They are just the author of the findings. You need the expert who actually carried out the work and that is the person who should write the SFR2.”<sup>171</sup>

### Digital evidence

145. Digital evidence is now a key component in many criminal trials. Mark Stokes estimated that “90% of crime ... has a digital element, in the broadest sense of that: CCTV, communications data, social media data, cyberattacks.”<sup>172</sup> Witnesses told us about the amount of data that is prevalent in most investigations and the difficulties of interrogating the evidence in an acceptable timeframe. Angus Marshall explained that “the privacy issues and the increase in security that has been put on to devices ... presents challenges to us.” This was coupled with most devices having large storage limits so “there is a limit to how quickly we can extract data from devices, so that adds time in every investigation.”<sup>173</sup>
146. Digital forensic practitioners told us that lawyers often do not understand the practicalities of analysing digital evidence and the amount of time and manpower involved. Dr Jan Collie, Managing Director and Senior Forensic Investigator at Discovery Forensics, said that defence lawyers “frequently do not think about the potential value that the digital evidence might have in a particular case. Therefore, they are racing to the finish and they think about it a couple of weeks before the trial ... There is quite a lot of disorganisation there.”<sup>174</sup>
147. Professor Peter Sommer told us that this disorganisation was often displayed by judges as well: “judges must have much better case management where there is digital evidence.”<sup>175</sup> In particular, they should have a better sense of the capabilities of the forensic scientists working on the case. Mark Stokes explained that the digital forensic unit in the Metropolitan Police had “a seven-month backlog.” They were working to reduce that backlog through outsourcing but he was clear that they “cannot meet the demand currently with what we have.”<sup>176</sup> The evidence was clear that very considerable investment was needed in the use of modern technology to search and analyse digital content.

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169 Judiciary of England and Wales, ‘Streamlined Forensic Reporting’, *Better Case Management (BCM) Newsletter*, Issue 12, p 3

170 [Q 111](#) (Dr David Schudel)

171 [Q 37](#) (Adrian Foster)

172 [Q 126](#) (Mark Stokes)

173 [Q 121](#) (Angus Marshall)

174 [Q 126](#) (Dr Jan Collie)

175 [Q 125](#) (Professor Peter Sommer)

176 [Q 131](#) (Mark Stokes)

148. Digital forensic evidence also has specific issues with commercial confidentiality when it comes to revealing how data were extracted and analysed. Sir Brian Leveson told us about a case in which:

“the contents of a phone had been wiped ... and there were great difficulties finding out what had been on the phone. However, a commercial provider managed to download or retrieve some of the messages. The defence wanted to know how they had done that and the scientist was not prepared to explain it, first, because it was commercially confidential and, secondly, if he explained how he had done it, the next time round they would find a way of avoiding that problem.”<sup>177</sup>

149. *Digital evidence will become even more prevalent in trials in the coming years. There needs to be a better understanding among legal practitioners of the timescales involved in interrogating and analysing digital evidence where modern technology is not used; this must be built into the pre-trial process.*
150. *The Ministry of Justice and the Home Office should invest in research of automation techniques for data retrieval and analysis to reduce the resources and time taken to process and analyse digital evidence and thus reduce delays in the criminal justice system. In doing so, they should assess the use of these techniques in the civil court system and consider what other examples of best practice could be replicated.*
151. *We recommend that the Government works urgently to build capacity and resilience in digital forensics. The new role of the Forensic Science Regulator should take into account the need for digital forensic capacity in the course of regulating the market.*

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177 [Q 178](#) (Sir Brian Leveson)

## CHAPTER 6: RESEARCH AND DEVELOPMENT

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### Scientific basis for forensic science

152. There are three main areas where there has been increasing scrutiny of the scientific base for forensic science:
- (1) The scientific validity of the approaches used to identify the source of a material or mark, and the challenges in addressing complex mixed provenance samples.<sup>178</sup>
  - (2) The need to understand better the activity of materials to aid interpretation of forensic science evidence (i.e. the activities that led to the generation or transfer of those materials), and their implications for reaching conclusions when reconstructing crime events.<sup>179</sup>
  - (3) Awareness of the importance of human decision-making in the forensic science process and the challenges of identifying factors which can affect judgments (such as cognitive bias; the appropriate use of statistics and probabilities to convey evidential significance; and how forensic science evidence is presented in court).<sup>180</sup>

### *Forensic science analysis methods and 'source attribution'*

153. In response to a critical report in 2009 in the United States by the National Research Council,<sup>181</sup> President Obama commissioned a study in 2015 to examine the scientific validity of different forensic science methods, including:
- DNA analysis of single-source and simple-mixture samples,
  - DNA analysis of complex-mixture samples,
  - bitemarks,
  - latent fingerprints,
  - firearms identification, and
  - footwear analysis.

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178 Executive Office of the President, President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (September 2016): [https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast\\_forensic\\_science\\_report\\_final.pdf](https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf) [accessed 5 February 2019]

179 Forensic Science Regulator, *Annual Report November 2016–November 2017*, (19 January 2018): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/674761/FSRAnnual\\_Report\\_2017\\_v1\\_01.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674761/FSRAnnual_Report_2017_v1_01.pdf) [accessed 21 February 2019]

180 Forensic Science Regulator, *Guidance: Cognitive Bias Effects, Relevant to Forensic Science Examinations, (FSR-G-217, Issue 1)* (2015): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/510147/217\\_FSR-G-217\\_Cognitive\\_bias\\_appendix.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/510147/217_FSR-G-217_Cognitive_bias_appendix.pdf) [accessed 21 February 2019] and Executive Office of the President, President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*

181 Committee on Identifying the Needs of the Forensic Science Community, National Research Council of the National Academies, *Strengthening Forensic Science in the United States: A Path Forward*

The resulting report<sup>182</sup> found that many of these methods did not meet the scientific standards for foundational validity. This is concerning because the methods are routinely used as evidence in court.

154. There are concerns about methodology in pattern recognition and in the analysis of trace materials for ‘source attribution’.
155. In regard to pattern comparison methods, Professor Niamh Nic Daéid, Director of the Leverhulme Research Centre for Forensic Science at Dundee University, explained that the underpinning science for “DNA analysis, toxicology or the measurement of drugs”<sup>183</sup> was considered strong. However, “the comparison of fingerprints, toolmarks, footwear, tire marks and ballistics” were “spot-the-difference” techniques in which “there is little, if any, robust science involved in the analytical or comparative processes used and as a consequence there have been questions raised around the reproducibility, repeatability, accuracy and error rates of such analysis.”<sup>184</sup>
156. Concerns have been raised about the ability of experts to interpret accurately the results of scientific tests. As the sensitivity and resolution of analytical capabilities have increased, it has become increasingly common to identify multiple components in a single trace or specimen, often described as ‘mixed source’ samples. In the then Government Chief Scientific Adviser’s annual report for 2015–16, Sir Mark Walport explained:

“new capabilities create other challenges for our existing systems; in particular, our ability to analyse may outstrip our ability to interpret. Because we can identify very small traces of a substance, we need greater certainty in understanding their significance and better ways to communicate different levels of confidence.”<sup>185</sup>

These concerns were echoed in the Forensic Science Regulator’s annual reports in 2015,<sup>186</sup> 2016,<sup>187</sup> 2017,<sup>188</sup> and 2018<sup>189</sup> which identified a lack of data to underpin the evaluative interpretation of traces.

157. The concerns in relation to the scientific standards, scientific reliability, methodology, comparison and interpretation expressed by the US National Research Council and others led to some initiatives being taken in the United Kingdom to address these concerns. These included the work by

182 Executive Office of the President, President’s Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*

183 Q 43 (Professor Niamh Nic Daéid)

184 Written evidence from Leverhulme Research Centre for Forensic Science (FRS0079)

185 Government Office for Science, *Forensic Science and Beyond: Authenticity, Provenance and Assurance, Annual Report of the Government Chief Scientific Adviser 2015* (2015), p 6: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/506461/gs-15-37a-forensic-science-beyond-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/506461/gs-15-37a-forensic-science-beyond-report.pdf) [accessed 5 February 2019]

186 Forensic Science Regulator, *Annual Report November 2014–November 2015*, (4 December 2015): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/482248/2015\\_FSR\\_Annual\\_Report\\_v1\\_0\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/482248/2015_FSR_Annual_Report_v1_0_final.pdf) [accessed 5 February 2019]

187 Forensic Science Regulator, *Annual Report November 2015–November 2016*, (6 January 2017): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/581653/FSR\\_Annual\\_Report\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/581653/FSR_Annual_Report_v1.0.pdf) [accessed 5 February 2019]

188 Forensic Science Regulator, *Annual Report November 2016–November 2017*, (19 January 2018): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/674761/FSRAnnual\\_Report\\_2017\\_v1\\_01.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674761/FSRAnnual_Report_2017_v1_01.pdf) [accessed 5 February 2019]

189 Forensic Science Regulator, *Annual Report November 2017–November 2018 (15th March 2019)*: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/786137/FSRAnnual\\_Report\\_2018\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786137/FSRAnnual_Report_2018_v1.0.pdf) [accessed 27 March 2019]

the Law Commission culminating in its Report on Expert Evidence in Criminal Proceedings in 2011, work by the Royal Society (including the work on primers described at paragraph 131 and an international conference in February 2015), a grant from the Leverhulme Foundation of the Research Centre for Forensic Science at Dundee University and the establishment (after initial work by the Chief Scientific Adviser at the Home Office, Sir Bernard Silverman,) of the Science and Justice Forum by Sir Mark Walport (then Government Chief Scientific Adviser) and Sir Mark Sedwill (then Permanent Secretary at the Home Office). What was lacking was strategic oversight which was essential for the reasons and purposes we have set out in Chapter 2.

*Forensic science interpretation: assessing the ‘activity level’*

158. We heard that there is a lack of research to help experts assess the ‘activity level’ of materials. This refers to the way in which materials, such as DNA and other traces, may transfer between objects and how long they can be expected to remain there.

159. The Metropolitan Police Service illustrated this:

“Advancement in DNA recovery and analysis techniques has provided greater sensitivity and changed the interpretation of the evidence. A practical example of such a gap is in DNA transfer. Whilst there are many published papers on this, further basic research would inform the ability of the scientist to interpret DNA results in the context of transfer, for example, the likelihood that DNA from a surrounding area can be transferred onto an item. Similarly, in fingerprint comparison, there are some gaps in understanding activity level reporting.”<sup>190</sup>

160. The implications of being able to address how and when a material was generated or transferred were highlighted by the Science and Justice Research Interest Group at Northumbria University, who stated that “when examining occasions in which forensic science has been implicated in a wrongful conviction, often it is because the scientific evidence was relied upon to answer ‘activity level’ questions, when it was unable to do so”.<sup>191</sup>

*Forensic science interpretation: human judgement and decision making*

161. Human judgement and decision making are integral to every stage of the forensic process (see figure 1). Human decisions are vulnerable to bias; the issue of bias in forensic science evidence interpretation was raised by many witnesses<sup>192</sup> as well as in a number of reports, such as the 2016 report by the President’s Council of Advisors on Science and Technology.<sup>193</sup>

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190 Written evidence from the Metropolitan Police Service (MPS) ([FRS0064](#))

191 Written evidence from Science and Justice Research Interest Group (RIG) and Northumbria University ([FRS0051](#))

192 Written evidence from Professor Gary Edmond, University of New South Wales ([FRS0022](#)), The Chartered Society of Forensic Sciences ([FRS0025](#)), UCL Centre for the Forensic Sciences (CFS) ([FRS0041](#)), Northumbria University Forensic Science Unit Research Interest Group ([FRS0050](#)), Keith Borer Consultants ([FRS0061](#)), University of Portsmouth Forensic Innovation Centre ([FRS0058](#)), Forensic Access ([FRS0066](#)), Dr Geoffrey Stewart Morrison ([FRS0074](#)), University of Leicester ([FRS0082](#)) and Inns of Court College of Advocacy (ICCA) ([FRS0089](#))

193 Executive Office of the President, President’s Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*

162. We were told by Dr Itiel Dror about empirical studies that showed that the conclusion in some areas of forensic science could be unduly subjective and influenced by human factors.<sup>194</sup>
163. This is an important challenge. The University of Leicester stated that it “requires more research focused on human factors in forensic science, including better understanding of the cognitive process of pattern recognition, the psychological nature of ‘expertise’, and sources, causes, and consequences of cognitive bias.”<sup>195</sup>
164. Dr Christopher Lawless told us that “the use of statistical methods for evidence interpretation has been developed and discussed within the forensic scientific community for some time.”<sup>196</sup> However, Professor Norman Fenton indicated that “the statistical aspects of forensic evidence are often either simply overlooked (because they are considered too difficult) or poorly presented by both lawyers and forensic scientists.”<sup>197</sup>
165. There are difficulties in interpreting forensic science from the use of statistics and probabilities to assign weight and significance. There have been initiatives to increase awareness of the use of statistics, such as the primer from the Royal Statistical Society and the guide from the Inns of Court College of Advocacy (see para 132).<sup>198</sup> However, we heard that the challenges are exacerbated by a lack of research into the likelihood of certain activities resulting in the generation or transfer of forensic materials. In addition, Lord Hughes of Ombersley, a former Justice of the Supreme Court, told us that “there is very little in the way of scientific research that helps with evaluating the significance of a match once you have discovered one. How significant the match is depends in the end on what the chances of a random match are. That means research and databases.”<sup>199</sup>

## Research and development

### *Funding*

166. We heard of the desirability of investing in research and development to address technological developments in and foundational research into forensic science. Witnesses referred to the difficulties in obtaining funding for forensic science research. The UCL Centre for the Forensic Sciences wrote that while there were limited “opportunities for short-term, tender-based, funding to develop technology to be deployed within 12 months to the crime scene”, it was harder to fund “mid- to long-term projects, which can develop foundational research that leads to innovations and deployable solutions in the future (e.g. 10–20 years’ time)”.<sup>200</sup>
167. One reason that funding for forensic science projects is difficult to obtain is that there is no unit of assessment for forensic science in the Research Excellence Framework. This means that there is, according to

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194 Q 23 (Dr Itiel Dror)

195 Written evidence from the University of Leicester (FRS0082)

196 Written evidence from Dr Christopher Lawless (FRS0007)

197 Written evidence from the Alan Turing Institute (FRS0030)

198 ICCA, RSS, *Statistics and probability for advocates: Understanding the use of statistical evidence in courts and tribunals* (2017)

199 Q 179 (Lord Hughes of Ombersley)

200 Written evidence from UCL Centre for the Forensic Sciences (FRS0041)

Professor Dame Sue Black, “no great drive from the universities in terms of their quality of research to put forensic science at the top of that.”<sup>201</sup>

168. The formalised way in which academic research funding is allocated, and the focus on innovation, may also disadvantage forensic science. Dr Geoffrey Stewart Morrison told us that “forensic science research often focusses on applying existing science and technology to forensic problems and on empirical validation under casework conditions, foci which the granting agencies’ and journals’ reviewers often do not perceive as innovative.”<sup>202</sup> Angus Marshall said that the result was sometimes that researchers “find that the best way they can make progress is to disguise their work, “piggy back” it onto another project, or undertake it as consultancy activity through casework, which may result in an embargo or prohibition on publication of their results.”<sup>203</sup>
169. Despite recommendations over a number of years by the House of Commons Science and Technology Committee<sup>204</sup> that forensic science should be a research priority, Rebecca Endean from UK Research and Innovation (UKRI) told us that over the last 10 years only £56 million had been spent on 150 studies<sup>205</sup> relating to forensic science. This accounted for a “relatively small percentage” of their overall expenditure in that time, with the “annual expenditure of UKRI over that 10-year period [being] roughly £6 billion.”<sup>206</sup> The percentage is less than 0.1%. The list of projects UKRI referred to in supplementary written evidence included under the category of forensic science many projects which, on analysis, did not address forensic science research questions, had little forensic science content or which referred to forensic science as one of many possible applications of the research.<sup>207</sup>

#### *Research by commercial providers*

170. Given the difficulties in obtaining funding for forensic science research in the academic sector, it has been suggested that more research could be carried out by private providers. However, barriers to research in the private sector are just as high, if not higher, than in the academic sector.
171. As explained in Chapter 3, private providers are struggling to remain profitable; in these conditions research and development is deprioritised. Dr Mark Pearse, Commercial Director of Eurofins Forensic Services, told us that Eurofins Forensic Services regards “no area as being at the right level of profitability to sustain reinvestment in innovation”.<sup>208</sup> Professor Carole McCartney thought that in the current market conditions the private sector could not be expected “to provide blue-sky thinking and invest in research and development”.<sup>209</sup>

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201 [Q 43](#) (Professor Dame Sue Black)

202 Written evidence from Dr Geoffrey Stewart Morrison ([FRS0074](#))

203 Written evidence from Mr Angus Marshall ([FRS0019](#))

204 See, Science and Technology Committee, *Forensic Science Strategy* (Fourth Report, Session 2016–17, HC 501), Science and Technology Committee, *Forensic science: Volume I* (Second Report, Session 2013–14, HC 610), and Science and Technology Committee, *The Forensic Science Service: Volume I* (Seventh Report, Session 2010–12, HC 855)

205 This number was revised to £56 million spent on 150 studies in the supplementary written evidence from UK Research and Innovation (UKRI) ([FRS0105](#))

206 [Q 150](#) (Rebecca Endean)

207 Supplementary written evidence from UK Research and Innovation (UKRI) ([FRS0105](#))

208 [Q 70](#) (Dr Mark Pearse)

209 [Q 63](#) (Professor Carole McCartney)

172. The result was that where research and development was carried out by private providers “it is often focussed on development and improvement of core services to meet primary customer needs, rather than on transformational innovation.”<sup>210</sup> ADS Group explained that without “wider changes to the funding and commissioning of forensic science the government must inevitably step up its own forensic science research through [the Defence Science and Technology Laboratory] or other bodies.”<sup>211</sup>

### *Research gaps*

173. As well as concerns about the scientific basis for some forensic methods (see paragraphs 152–165), we heard about other research gaps.<sup>212</sup> Almost every forensic science sub-discipline has areas that evidence suggests would benefit from further research. It is clear that forensic science needs more sustained and coordinated funding for research and development in both technological developments and foundational research.
174. The lack of coordinated strategic thinking around research and development in forensic science means that there is not an established process for legal practitioners and, to an extent, forensic service practitioners to outline the areas they think need more research.
175. The judges who gave evidence to us were keen to see more research on “evaluating the significance of a match once you have discovered one”,<sup>213</sup> “researching transfer and persistence”<sup>214</sup> and building better databases, an area which has suffered since the demise of the Forensic Science Service.<sup>215</sup>

### *Digital forensics*

176. Digital forensics is a rapidly growing field. While it faces many of the same challenges as other forms of forensic science evidence, given the speed of developments and the volume of material that is now routinely produced, it also faces specific challenges. In Chapter 5 we considered the challenges of analysing digital evidence in the timescales demanded in the criminal justice system and stressed the need for further investment in the use of modern technology. There is little research into techniques to sift and analyse data such as artificial intelligence and machine learning. Paul Hackett, Group Managing Director at Key Forensic Services Ltd, told us, “Who is pushing the technology drive in artificial intelligence in digital forensics in the UK? ... Nobody.”<sup>216</sup>
177. Care must be taken with the use of artificial intelligence and machine learning. Dr Jan Collie explained that “human biases might be replicated by some of these machine-learning systems” and that “with artificial intelligence, it is very hard to explain what happened and how the machine came up with a particular answer”.<sup>217</sup>

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210 Written evidence from Eurofins Forensic Services (EFS) ([FRS0063](#))

211 Written evidence from ADS Group ([FRS0026](#))

212 See, for instance, written evidence from Institute of Traffic Accident Investigators (ITAI) ([FRS0023](#)), Alan Turing Institute ([FRS0030](#)) and International Union of Geological Sciences (IUGS) ([FRS0033](#))

213 [Q 179](#) (Lord Hughes of Ombersley)

214 [Q 179](#) (His Honour Judge Wall QC)

215 [Q 179](#) (Sir Brian Leveson)

216 [Q 78](#) (Paul Hackett)

217 [Q 127](#) (Dr Jan Collie)

178. There is also an issue in relation to disclosure of the methods used. It is generally essential that there is disclosure so that the methods used are open to scrutiny and peer review of its accuracy and reliability. However, claims of commercial confidentiality are sometimes made by some private providers who are unwilling “to disclose information about their own development and testing methods [which] means that the evidence base for the correctness of many digital methods is extremely weak or non-existent.”<sup>218</sup> Such claims can rarely provide a proper justification for the withholding of disclosure of the methodology, when the results obtained through the methodology are to be used in a criminal trial. However, there are circumstances where the prosecution contends that the disclosure of the methodology will give rise to risks to national security on the basis that disclosure may enable terrorists or criminals to take measures to avoid detection or may compromise an investigation; it will be for the court to decide whether the withholding of disclosure is justified.<sup>219</sup>
179. Paul Harris explained there were issues with determining search terms for a machine to use: “In a criminal case, there is often a whole hidden undercurrent of different words to describe drugs, drop-offs, firearms and things like that, which makes conducting these types of searches harder.”<sup>220</sup>
180. While mindful of these limitations, it is clear that investigators will be unable to keep up with demand for analysis of digital evidence without some technological assistance. Mark Stokes told us that a modern mobile phone:
- “could have 1 terabyte of data on it, which is 78 million documents or pages of information on one mobile device, and it is becoming impossible for an investigator to review, disclose, analyse, view and read all that information. Therefore, artificial intelligence and machine learning both have a part to play in this, but we have to be very careful in the application of these technologies. We need academia and science to work with us to do the testing and validation.”<sup>221</sup>
181. Just as with traditional forensic science, research and development in digital forensics needs coordination and strategic planning. It has been made clear to us that this is lacking.<sup>222</sup>

*A new strategic research body*

182. There is a clear case for establishing an overarching body with responsibility for directing research into and funding of forensic science. The Forensic Science Service funded some research before it was disbanded.<sup>223</sup> Since then, there has been no national research programme for forensic science.
183. Rebecca Endean agreed that a strategic oversight body for research would be “very useful” and cited the Office for Strategic Coordination of Health Research (OSCHR) as a good example of a similar body. OSCHR “brings together the [National Institute for Health Research], [UK Research and Innovation], the devolved Administrations and practitioners—who are really important in this agenda—to talk. That works quite well. You could

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218 Written evidence from Mr Angus Marshall ([FRS0019](#))

219 Royal Courts of Justice, *Kelly, R v England and Wales Court of Appeal*, (EWCA) Crim 1893 (2018)

220 [Q 145](#) (Paul Harris)

221 [Q 127](#) (Mark Stokes)

222 [Q 130](#) (Mark Stokes)

223 [Q 143](#) (Paul Harris). See also written evidence from Keele University ([FRS0081](#)).

see something like this—not controlling the money but deciding what the priorities and the gaps are.”<sup>224</sup>

184. Lord Hughes of Ombersley recommended that this new body should be a Royal College of Forensic Scientists.<sup>225</sup> Keele University suggested it should be an “independent national institute”, which should be “quite separate from any university and would need to be government funded. By working closely with both the police, the judiciary and through links with research groups in universities, the institute would be able to focus on long term priority projects and provide consultancy expertise on immediate problems.”<sup>226</sup> The institute could “act as a focal point and be able to coordinate inter-agency research and other activities amongst police forces, universities, private commercial providers and indeed various legal groups and bodies.”<sup>227</sup>
185. In designing a research body, England and Wales could look at Australia and New Zealand’s National Institute of Forensic Science which, as UCL Centre for the Forensic Sciences wrote, “has the strategic intent to promote and facilitate excellence in forensic science through ... promoting, sponsoring and supporting research in forensic science in areas of identified strategic importance, and supporting, coordinating and conducting training programmes ... for practitioners”<sup>228</sup>.<sup>229</sup>
186. There would need to be a dedicated stream of funding, perhaps through UKRI and industry, to deliver a strategic programme of high-quality research that addresses technological developments and foundational research in the short, medium and long term.
187. *Current levels of investment in forensic science research are inadequate and do not appear to reflect value to the criminal justice system. We believe that the Home Office has abdicated its responsibility for research in forensic science. We recommend that UK Research and Innovation urgently and substantially increase the amount of dedicated funding allocated to forensic science for both technological advances and foundational research, with a particular focus on digital forensic science evidence and the opportunities to develop further capabilities in artificial intelligence and machine learning.*
188. *We recommend the creation of a National Institute for Forensic Science within the UK Research and Innovation family, to set strategic priorities for forensic science research and development, and to coordinate and direct research and funding. This body should work closely with the police, the judiciary, universities, private forensic science providers and the Forensic Science Regulator to fulfil these duties. It should be accountable to UK Research and Innovation who should submit an annual report on the activities of the National Institute for Forensic Science to the Forensic Science Board.*

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224 Q 149 (Rebecca Endean)

225 Q 179 (Lord Hughes of Ombersley)

226 Written evidence from Keele University (FRS0081)

227 *Ibid.*

228 Australia New Zealand Policing Advisory Agency (ANZPAA), *The Peak Body for Forensic Science in Australia and New Zealand* (March 2019): <http://www.anzpaa.org.au/forensic-science/about> [accessed 25 February 2019]

229 Written evidence from UCL Centre for the Forensic Sciences (FRS0041)

## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

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### Introduction

1. A free society is dependent on the rule of law which in turn relies on equality of access to justice. The evidence we received points to failings in the use of forensic science in the criminal justice system and these can be attributed to an absence of high-level leadership, a lack of funding and an insufficient level of research and development. Throughout this inquiry we heard about the decline in forensic science in England and Wales, especially since the abolition of the Forensic Science Service. (Paragraph 5)

### Oversight, leadership and responsibility

2. It is clear that there is a need to deliver strategic and accountable leadership that reflects all the main stakeholders to set the vision, strategy, and agenda for forensic science. (Paragraph 36)
3. The Home Office and the Ministry of Justice are not working closely enough to address the absence of high-level leadership in forensic science. Furthermore, it is necessary to ensure that the operational independence of the police and the independence of the courts and of forensic scientific evidence are safeguarded. Therefore we recommend the creation of a Forensic Science Board as an arm's-length body to be responsible for the coordination, strategy and direction of forensic science in England and Wales. (Paragraph 37)
4. The Forensic Science Board should work with the newly expanded role of the Forensic Science Regulator (see recommendation in Chapter 3), the National Institute for Forensic Science proposed by this report (see recommendation in Chapter 6), and wider stakeholders to create and deliver a new forensic science strategy which focuses on greater coordination and collaboration. The strategy should aim to promote proper understanding of forensic science in the criminal justice system. The Board should also consider levels of funding and the value for money in the forensic science market. The Forensic Science Board should set England and Wales on track to regaining its world-class status in forensic science. (Paragraph 38)
5. The Board should be chaired by a retired senior judge with experience of criminal casework. Membership should include the Director of the new National Institute for Forensic Science proposed by this report, a senior academic, and a senior police officer. The Home Secretary and the Secretary of State for Justice should be jointly accountable to Parliament for the Board. (Paragraph 39)

### The forensic science market

6. The instability of the forensic science market is a serious risk to the criminal justice system. We recommend that the Forensic Science Regulator's remit and resources be reformed and expanded to include responsibility for regulating the market. (Paragraph 72)
7. The expanded role of the Forensic Science Regulator should review the structure of the market for forensic science in England and Wales and, in particular, the procurement process for commissioning private sector providers alongside provision by police forces. The objective should be to determine a procurement model which balances price, quality and market

sustainability; ensures a level playing field between private and public sector providers; avoids undue shocks to the market, such as the clustering of contracts in any one year; and which maintains the capabilities of small providers in niche disciplines. (Paragraph 73)

### Ensuring trust in forensic science

8. The Forensic Science Regulator should work with UKAS to find a proportionate way to reduce costs of accreditation for niche and smaller private providers. Exemptions from accreditation should exist for providers using new or non-standard techniques which could not yet be accredited, but the court should be made aware of this. (Paragraph 90)
9. We see a clear benefit in ensuring that most forensic science providers are accredited to the appropriate ISO standards. The Forensic Science Regulator should review the current regulation framework and make any necessary changes to ensure that it promotes good practice. (Paragraph 91)
10. While we are not recommending an accreditation process for individual practitioners of forensic science, an independent tribunal mechanism should be established within the Forensic Science Regulator with the power to prevent individuals from providing expert testimony in court where the individual has been found to have presented misleading or insufficiently evidenced opinion. This debarment should apply until the tribunal is satisfied that the individual has demonstrated their competence to resume giving expert testimony. The Regulator should also have powers to issue fines and improvement notices to individuals who do not deserve debarment and those individuals should have the right to appeal to the tribunal. (Paragraph 98)
11. The Forensic Science Regulator should also maintain a register of forensic science practitioners who have been debarred from giving evidence in court. (Paragraph 99)
12. Since 2012, the Government has given assurances that statutory powers needed by the regulator would be forthcoming but has taken no action. We consider that seven years is an embarrassing time to delay legislation, particularly as time has been found for several other Home Office Bills. The Forensic Science industry is in trouble; such action is now urgent. The Government should introduce statutory powers for the Forensic Science Regulator. Private members' bills cannot be relied on to do this. The Government should demonstrate its commitment to this issue by introducing a Government bill giving the Forensic Science Regulator the following properly funded statutory powers:
  - The power to issue improvement notices and fines
  - The power to prevent individuals from providing expert testimony to courts with a corresponding appeals process
  - The power to investigate a forensic science provider and take enforcement action.
  - The power to rescind a forensic science provider's accreditation.
  - The power to inspect, without notice, accredited forensic science providers. (Paragraph 109)

13. The Forensic Science Board, with input from the College of Policing and the Chartered Society of Forensic Sciences, should develop a strategy for the ongoing training of all forensic science practitioners, with a particular focus on maintaining competence in niche disciplines and providing expert evidence in a legal setting. (Paragraph 116)

### **The use of forensic science in the criminal justice system**

14. Cuts to legal aid have affected the ability of defendants to access forensic expertise. We recommend that the Legal Aid Agency liaise with the market-regulation arm within the expanded role of the Forensic Science Regulator to set new pricing schemes, properly funded by the Ministry of Justice, for forensic testing and expert advice for defendants. (Paragraph 123)
15. The new Forensic Science Board should have ultimate responsibility for ensuring ongoing guidance to the judiciary and the legal professional about the accurate scientific position on the main types of forensic science. Although this must be a matter for the Board, there is clear benefit in continuing the work that has produced primers on key topics, albeit at an increased pace and with a broader scope. They should be responsible for enabling dialogue and sharing of best practice, and responding to new developments as they arise. (Paragraph 135)
16. We recommend that all advocates practising in the criminal courts should, as part of their continuing professional development, be required to undertake training in the use of scientific evidence in court and basic scientific principles such as probability, scientific inference and research methods. (Paragraph 136)
17. Digital evidence will become even more prevalent in trials in the coming years. There needs to be a better understanding among legal practitioners of the timescales involved in interrogating and analysing digital evidence where modern technology is not used; this must be built into the pre-trial process. (Paragraph 149)
18. The Ministry of Justice and the Home Office should invest in research of automation techniques for data retrieval and analysis to reduce the resources and time taken to process and analyse digital evidence and thus reduce delays in the criminal justice system. In doing so, they should assess the use of these techniques in the civil court system and consider what other examples of best practice could be replicated. (Paragraph 150)
19. We recommend that the Government works urgently to build capacity and resilience in digital forensics. The new role of the Forensic Science Regulator should take into account the need for digital forensic capacity in the course of regulating the market. (Paragraph 151)

### **Research and development**

20. Current levels of investment in forensic science research are inadequate and do not appear to reflect value to the criminal justice system. We believe that the Home Office has abdicated its responsibility for research in forensic science. We recommend that UK Research and Innovation urgently and substantially increase the amount of dedicated funding allocated to forensic science for both technological advances and foundational research, with a particular focus on digital forensic science evidence and the opportunities to

develop further capabilities in artificial intelligence and machine learning.  
(Paragraph 187)

21. We recommend the creation of a National Institute for Forensic Science within the UK Research and Innovation family, to set strategic priorities for forensic science research and development, and to coordinate and direct research and funding. This body should work closely with the police, the judiciary, universities, private forensic science providers and the Forensic Science Regulator to fulfil these duties. It should be accountable to UK Research and Innovation who should submit an annual report on the activities of the National Institute for Forensic Science to the Forensic Science Board.  
(Paragraph 188)

## APPENDIX 1: LIST OF MEMBERS AND DECLARATIONS OF INTEREST

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### Members

Lord Borwick  
 Lord Fox  
 Lord Griffiths of Fforestfach  
 Lord Hunt of Chesterton  
 Lord Kakkar  
 Lord Mair  
 Baroness Manningham-Buller (co-opted)  
 Lord Maxton  
 Baroness Morgan of Huyton  
 Baroness Neville-Jones  
 Lord Oxburgh  
 Lord Patel (Chairman)  
 Lord Renfrew of Kaimsthorn  
 Lord Thomas of Cwmgiedd (co-opted)  
 Lord Vallance of Tummel  
 Baroness Young of Old Scone

### Declarations of Interest

Lord Borwick  
*No relevant interests declared*

Lord Fox  
*No relevant interests declared*

Lord Griffiths of Fforestfach  
*No relevant interests declared*

Lord Hunt of Chesterton  
*Fellow, Royal Society, and Member of other professional societies*  
*Director and chair of CERC Ltd, Cambridge*  
*Emeritus Professor at University College London*  
*Visiting Professor at Delft University Technology, Netherlands*  
*Fellow, Trinity College Cambridge*

Lord Kakkar  
*Chair, Judicial Appointments Commission*  
*Professor of Surgery, University College London*

Lord Mair  
*Fellow, Royal Society*  
*Fellow, Royal Academy of Engineering*  
*Emeritus Professor of Civil Engineering and Director of Research, University of Cambridge*

Baroness Manningham-Buller (co-opted)  
*No relevant interests declared*

Lord Maxton  
*No relevant interests declared*

Baroness Morgan of Huyton  
*Vice-Chair of Council, King's College, University of London*

Baroness Neville-Jones  
*No relevant interests declared*

Lord Oxburgh

*No relevant interests declared*

Lord Patel (Chairman)

*Fellow, Royal Society of Edinburgh*

*Professor Emeritus, University of Dundee*

*Retired Chancellor, University of Dundee*

Lord Renfrew of Kaimsthorn

*No relevant interests declared*

Lord Thomas of Cwmgiedd (co-opted)

*Until retirement as a judge on 1 October 2017, was very closely involved in the issues relating to forensic science; gave several judgments on cases involving forensic science, gave lectures on this subject and worked with many in the field, including the Royal Society, the Regulator, the Home Office and the Leverhulme Research Centre for Forensic Science at Dundee University*

Lord Vallance of Tummel

*No relevant interests declared*

Baroness Young of Old Scone

*Chancellor of Cranfield University*

A full list of Members' interests can be found in the Register of Lords Interests: <http://www.parliament.uk/mps-lords-and-offices/standards-and-interests/register-of-lords-interests/>

### **Specialist adviser**

Professor Ruth Morgan, Director, UCL Centre for the Forensic Sciences and Professor of Crime and Forensic Science

*Member of the Chartered Society of Forensic Sciences*

*Undertaken consultancy work through UCL Consultants and do so on an ad hoc basis*

*Senior Editor (Europe) for the journal Forensic Science International: Synergy*

*Sits on the Inns of Court College of Advocacy (ICCA) Working Group on Expert Witnesses*

*Sits on the Home Office: Search Technologies Academic Research Team (START)*

*Vice chair of the Forensic Geoscience Special Interest Group of the Geological Society*

## APPENDIX 2: LIST OF WITNESSES

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Evidence is published online at <https://www.parliament.uk/forensic-science-lords-inquiry> and available for inspection at the Parliamentary Archives (020 7219 3074).

Evidence received by the Committee is listed below in chronological order of oral evidence session and in alphabetical order. Those witnesses marked with \*\* gave both oral evidence and written evidence. Those marked with \* gave oral evidence and did not submit any written evidence. All other witnesses submitted written evidence only.

### Oral evidence in chronological order

- |    |  |                                 |
|----|--|---------------------------------|
| *  | Professor Tim Thompson, Professor of Applied Biological Anthropology, Teesside University  | <a href="#"><u>QQ 1–12</u></a>  |
| *  | Dr Karl Harrison, Lecturer in Forensic Archaeology, Cranfield Forensic Institute, Cranfield University   |                                 |
| *  | Dr Sarah Morris, Lecturer in Forensic Computing, Cranfield Forensic Institute, Cranfield University  |                                 |
| ** | Mark Burns-Williamson OBE, Police and Crime Commissioner for West Yorkshire, Chair of the Association of Police and Crime Commissioners (APCC) | <a href="#"><u>QQ 13–20</u></a> |
| ** | Chief Constable James Vaughan, Chief Constable of Dorset Police, lead on forensics for the National Police Chiefs Council (NPCC)               |                                 |
| ** | Jo Ashworth OBE, Programme Director, National Police Chiefs Council (NPCC) Transforming Forensics Programme                                    |                                 |
| *  | Dr Itiel Dror, Senior Cognitive Neuroscience Researcher, University College London   | <a href="#"><u>QQ 21–32</u></a> |
| ** | Dr Christopher Lawless, Associate Professor, Durham University   |                                 |
| ** | Adrian Foster, Chief Crown Prosecutor, Crown Prosecution Service   | <a href="#"><u>QQ 33–42</u></a> |
| *  | Chris Henley QC, Chair, Criminal Bar Association   |                                 |
| *  | Abigail Bright, Junior Representative, Criminal Bar Association  |                                 |
| ** | Professor Niamh Nic Daéid, Director of Leverhulme Research Centre for Forensic Science, Dundee University                                      | <a href="#"><u>QQ 43–53</u></a> |
| ** | Professor Dame Sue Black, Pro-Vice Chancellor for Engagement, Lancaster University   |                                 |
| *  | Professor Carole McCartney, Reader in the School of Law, Northumbria University  | <a href="#"><u>QQ 54–67</u></a> |

- \* Professor David Ormerod QC, Chair in Criminal Law, University College London and Law Commissioner for England and Wales
- \*\* Paul Hackett, Group Managing Director, Key Forensic Holdings Ltd [QQ 68–80](#)
- \*\* David Hartshorne, Managing Director, Cellmark Forensic Services
- \*\* Dr Mark Pearse, Commercial Director, Eurofins Forensic Services
- \*\* Danyela Kellett, Forensic Services Manager, Lancashire Constabulary [QQ 81–89](#)
- \* Carolyn Lovell, Head of Operations—Crime Scene Investigation, Hampshire Constabulary
- \* David Tucker, Faculty Lead, College of Policing
- \*\* Dr Julie Maxton CBE, Executive Director, Royal Society [QQ 90–98](#)
- \*\* Andrew Rennison, Commissioner, Criminal Cases Review Commission (CCRC)
- \*\* Emily Bolton, Founder and Legal Director, Centre for Criminal Appeals
- \*\* Tom Nelson OBE, Director of Forensic Sciences, Scottish Police Authority [QQ 99–109](#)
- \*\* Stan Brown CBE, Chief Executive, Forensic Service Northern Ireland (FSNI)
- \*\* Anthony Harbinson, Forensic Services Leadership Board (FSLB) of Northern Ireland
- \*\* Dr Anya Hunt, CEO, Chartered Society of Forensic Sciences [QQ 110–122](#)
- \*\* Angus Marshall, Director and Principal Scientist, n-gate Ltd
- \*\* Dr David Schudel, Forensic Scientist, Keith Borer Consultants
- \* Mark Stokes, Head of Digital, Cyber and Communications Forensics Unit, Metropolitan Police [QQ 123–131](#)
- \* Dr Jan Collie, Managing Director and Senior Forensic Investigator, Discovery Forensics
- \*\* Professor Peter Sommer, Professor of Digital Forensics, Birmingham City University
- \* Paul Harris, Senior Partner, Edward Fail, Bradshaw & Waterson Solicitors [QQ 132–146](#)
- \* Michael Caplan QC, Consultant, Criminal Litigation, Kingsley Napley LLP
- \* Sarah Whitehouse QC, Barrister, 6KBW College Hill

- \*\* Rebecca Endean, Director of Strategy, UK Research and Innovation (UKRI) [QQ 147–155](#)
- \*\* Lorraine Turner, Business Development and Technical Director, United Kingdom Accreditation Service (UKAS) [QQ 156–175](#)
- \*\* Katherine Monnery, Forensic Accreditation Specialist, United Kingdom Accreditation Service (UKAS)
- \*\* Sara Walton, Governance and Resilience Market Development Manager, British Standards Institution (BSI)
- \*\* Steve Brunige, Head of Industry and Government Engagement, British Standards Institution (BSI)
- \* Lord Hughes of Ombersley, former Justice of the Supreme Court [QQ 176–181](#)
- \* His Honour Judge Wall QC, Circuit Judge
- \* Sir Brian Leveson, President of the Queen’s Bench Division and Head of Criminal Justice
- \* Dr Sheila Willis, National Institute of Standards and Technology, United States [QQ 182–197](#)
- \*\* Dr Gillian Tully, Forensic Science Regulator [QQ 198–213](#)
- \* Professor Claude Roux, Director of Centre for Forensic Science, University of Technology, Sydney, and President of the International Association of Forensic Sciences [QQ 214–221](#)
- \*\* The Rt Hon Nick Hurd MP, Minister of State, Home Office [QQ 222–229](#)
- \*\* Professor John Aston, Home Office Chief Scientific Adviser, Home Office
- \*\* Christophe Prince, Director of Data and Identity within the Crime, Policing and Fire Group, Home Office
- \* Lucy Frazer QC MP, Parliamentary Under-Secretary, Ministry of Justice [QQ 230–240](#)
- \* Fiona Rutherford, Deputy Director of Legal Aid Strategy and Policy, Ministry of Justice
- \* Matthew Gould, Deputy Director of Criminal Courts and Criminal Law Policy, Ministry of Justice

### **Alphabetical list of all witnesses**

ADS Group	<a href="#">FRS0026</a>
Alan Turing Institute	<a href="#">FRS0030</a>
Alere Forensics	<a href="#">FRS0016</a>
Analytical Services International (ASI)	<a href="#">FRS0069</a>

**	Association of Police and Crime Commissioners (APCC) ( <a href="#">QQ 13–20</a> )	<a href="#">FRS0083</a>
**	Professor Dame Sue Black, Lancaster University ( <a href="#">QQ 43–53</a> )	<a href="#">FRS0008</a>
*	Abigail Bright, Junior Representative, Criminal Bar Association ( <a href="#">QQ 33–42</a> )	
**	British Standards Institution (BSI) ( <a href="#">QQ 156–175</a> )	<a href="#">FRS0103</a>
	Professor Fiona Brookman and Dr Helen Jones	<a href="#">FRS0106</a>
	Dr Gordon Burrow	<a href="#">FRS0092</a>
*	Michael Caplan QC, Consultant, Criminal Litigation, Kingsley Napley LLP ( <a href="#">QQ 132–146</a> )	
	Professor John Cassella and Dr Anna Williams	<a href="#">FRS0024</a>
**	Cellmark Forensic Services ( <a href="#">QQ 68–80</a> )	<a href="#">FRS0071</a>
**	Centre for Criminal Appeals ( <a href="#">QQ 90–98</a> )	<a href="#">FRS0068</a>
**	Chartered Society of Forensic Sciences ( <a href="#">QQ 110–122</a> )	<a href="#">FRS0025</a>
*	College of Policing ( <a href="#">QQ 81–89</a> )	
**	Criminal Cases Review Commission (CCRC) ( <a href="#">QQ 90–98</a> )	<a href="#">FRS0020</a>
**	Crown Prosecution Service (CPS) ( <a href="#">QQ 33–42</a> )	<a href="#">FRS0097</a>
*	Discovery Forensics Ltd ( <a href="#">QQ 123–131</a> )	
*	Dr Itiel Dror, Senior Cognitive Neuroscience Researcher, University College London ( <a href="#">QQ 21–32</a> )	
	Adrian Dupre-Picken	<a href="#">FRS0003</a>
	Professor Gary Edmond	<a href="#">FRS0022</a>
	Garry England	<a href="#">FRS0076</a>
	Eurofins Forensic Imagery Team	<a href="#">FRS0027</a>
**	Eurofins Forensic Services (EFS) ( <a href="#">QQ 68–80</a> )	<a href="#">FRS0063</a>
	Forensic Access	<a href="#">FRS0066</a>
	Forensic Equity Ltd	<a href="#">FRS0039</a>
	Forensic Geoscience Group	<a href="#">FRS0012</a>
**	Forensic Science Northern Ireland (FSNI) ( <a href="#">QQ 99–109</a> )	<a href="#">FRS0006</a>
**	Forensic Services Leadership Board (FSLB) of Northern Ireland ( <a href="#">QQ 99–109</a> )	<a href="#">FRS0052</a>
	Forensic Video Services	<a href="#">FRS0010</a>
	Angela Forshaw	<a href="#">FRS0046</a>
	Professor Simona Francese	<a href="#">FRS0049</a>
	Robert Green OBE	<a href="#">FRS0031</a>
	Dr Martin Hall	<a href="#">FRS0037</a>

- \* Hampshire Constabulary ([QQ 81–89](#))  
Dr Suzanne Harkins [FRS0047](#)
- \* Paul Harris, Senior Partner, Edward Fail, Bradshaw & Waterson Solicitors ([QQ 132–146](#))
- \* Dr Karl Harrison, Lecturer in Forensic Archaeology, Cranfield Forensic Institute, Cranfield University ([QQ 1–12](#))  
Professor David Hawksworth CBE [FRS0090](#)
- \* Chris Henley QC, Chair, Criminal Bar Association ([QQ 33–42](#))
- \*\* Home Office ([QQ 222–229](#)) [FRS0085](#)  
Christopher Hughes OBE [FRS0088](#)
- \* Lord Hughes of Ombersley ([QQ 176–181](#))  
Infra Tech Forensics (Video) Ltd [FRS0028](#)  
Inns of Court College of Advocacy [FRS0089](#)  
Inside Justice [FRS0004](#)  
Institute of Traffic Accident Investigators (ITAI) [FRS0023](#)  
IntaForensics Ltd [FRS0036](#)  
International Union of Geological Sciences (IUGS) [FRS0033](#)  
James Hutton Institute [FRS0042](#)  
Dr Helen Jones and Professor Fiona Brookman [FRS0106](#)  
Keele University [FRS0081](#)
- \*\* Keith Borer Consultants ([QQ 110–122](#)) [FRS0061](#)
- \*\* Danyela Kellett ([QQ 81–89](#)) [FRS0035](#)  
Dr Paul Kelly [FRS0091](#)
- \*\* Key Forensic Services Ltd ([QQ 68–80](#)) [FRS0048](#)  
King’s College London (King’s Forensics) [FRS0045](#)  
Knowledge Transfer Network Forensic Special Interest Group (FoSciSIG) [FRS0040](#)  
Lancashire Forensic Science Academy [FRS0054](#)
- \*\* Dr Christopher Lawless, Durham University ([QQ 21–32](#)) [FRS0007](#)  
[FRS0096](#)  
Dr Sandra Lean [FRS0013](#)
- \*\* Leverhulme Research Centre for Forensic Science ([QQ 45–53](#)) [FRS0079](#)  
[FRS0100](#)
- \* Sir Brian Leveson, President of the Queen’s Bench Division and Head of Criminal Justice ([QQ 176–181](#))  
Alastair Logan OBE [FRS0080](#)

- \*\* Angus Marshall, n-gate Ltd ([QQ 110–122](#)) [FRS0019](#)  
Peter Martin [FRS0017](#)
- \*\* Dr Julie Maxton CBE ([QQ 90–98](#)) [FRS0095](#)
- \* Professor Carole McCartney, Northumbria University ([QQ 54–67](#))  
Dr Wolfram Meier-Augenstein [FRS0032](#)  
Peter Merrill [FRS0021](#)
- \*\* Metropolitan Police Service ([QQ 123–131](#)) [FRS0064](#)  
Millington Hingley Ltd [FRS0075](#)
- \* Ministry of Justice ([QQ 230–240](#))
- \* Dr Sarah Morris, Lecturer in Forensic Computing, Cranfield Forensic Institute, Cranfield University ([QQ 1–12](#))  
Dr Geoffrey Stewart Morrison [FRS0074](#)  
National Ballistics Intelligence Service [FRS0043](#)
- \*\* National Police Chiefs’ Council (NPCC) ([QQ 13–20](#)) [FRS0053](#)
- \*\* National Police Chiefs’ Council (NPCC) [FRS0070](#)  
Transforming Forensics Programme ([QQ 13–20](#))  
NCC Group [FRS0044](#)  
Leisa Nichols-Drew [FRS0062](#)  
Northumbria University Centre for Evidence and Criminal Justice Studies [FRS0038](#)  
Northumbria University Forensic Science Unit [FRS0050](#)  
Nottingham Trent University [FRS0011](#)
- \* Professor David Ormerod QC, Chair in Criminal Law, University College London and Law Commissioner for England and Wales ([QQ 54–67](#))  
Andrew Postlethwaite [FRS0072](#)  
Radox Testing Services [FRS0099](#)  
Karen Richmond [FRS0101](#)  
Professor Paul Roberts [FRS0015](#)
- \* Professor Claude Roux, Director of Centre for Forensic Science, University of Technology, Sydney, and President of the International Association of Forensic Sciences ([QQ 214–221](#))
- \*\* Royal Society ([QQ 90–98](#)) [FRS0094](#)  
Royal Statistical Society [FRS0086](#)  
Science and Justice Research Interest Group (RIG), Northumbria University [FRS0051](#)
- \*\* Scottish Police Authority ([QQ 99–109](#)) [FRS0084](#)

	Serious Fraud Office	<a href="#">FRS0029</a>
	Dr Sara Short	<a href="#">FRS0018</a>
	Society for Applied Microbiology	<a href="#">FRS0056</a>
**	Professor Peter Sommer ( <a href="#">QQ 123–131</a> )	<a href="#">FRS0009</a>
		<a href="#">FRS0098</a>
	Karen Squibb-Williams	<a href="#">FRS0087</a>
	Strathclyde University	<a href="#">FRS0060</a>
*	Professor Tim Thompson, Professor of Applied Biological Anthropology, Teesside University ( <a href="#">QQ 1–12</a> )	
**	Dr Gillian Tully ( <a href="#">QQ 198–213</a> )	<a href="#">FRS0057</a>
		<a href="#">FRS0107</a>
**	UK Research and Innovation (UKRI) ( <a href="#">QQ 147–155</a> )	<a href="#">FRS0105</a>
**	United Kingdom Accreditation Service (UKAS) ( <a href="#">QQ 156–175</a> )	<a href="#">FRS0014</a>
		<a href="#">FRS0102</a>
		<a href="#">FRS0104</a>
	University College London (UCL) Centre for the Forensic Sciences	<a href="#">FRS0041</a>
	University of Edinburgh	<a href="#">FRS0067</a>
	University of Leicester	<a href="#">FRS0082</a>
	University of Portsmouth (Forensic Innovation Centre)	<a href="#">FRS0058</a>
	University of Reading, School of Biological Sciences	<a href="#">FRS0055</a>
	Verden Forensics	<a href="#">FRS0005</a>
	Visionations	<a href="#">FRS0108</a>
*	His Honour Judge Wall ( <a href="#">QQ 176–181</a> )	
	John Welch	<a href="#">FRS0034</a>
*	Sarah Whitehouse QC, Barrister, 6KBW College Hill ( <a href="#">QQ 132–146</a> )	
	Dr Anna Williams and Professor John Cassella	<a href="#">FRS0024</a>
*	Dr Sheila Willis, National Institute of Standards and Technology, United States ( <a href="#">QQ 182–197</a> )	
	Professor Patricia Wiltshire	<a href="#">FRS0078</a>
	WMG University of Warwick	<a href="#">FRS0093</a>
	Professor Jessica Woodhams (and Dr Kari Davies, Dr Matthew Tonkin and Dr Amy Burrell)	<a href="#">FRS0073</a>

## APPENDIX 3: CALL FOR EVIDENCE

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The House of Lords Science and Technology Select Committee, under the Chairmanship of Lord Patel, is conducting an inquiry into forensic science. The Committee invites interested individuals and organisations to submit evidence to this inquiry. The deadline for receiving written submissions is Friday 14 September.

### Background

In recent years concerns have been raised about the state of forensic science in the UK, and in particular in England and Wales. In July 2013 an inquiry by the House of Commons Science and Technology Committee concluded that major crimes could go unsolved unless the Government did more to support forensic science.<sup>230</sup> In 2015, the National Audit Office warned that forensic science provision was under threat because police were increasingly relying on unregulated experts to examine samples from suspects and crime scenes.<sup>231</sup>

In March 2016, the Home Office published its ‘Forensic Science Strategy’ to address some of these concerns.<sup>232</sup> In the strategy the Government stated its intention to give the Forensic Science Regulator statutory powers but has yet to bring forward legislation to do so.<sup>233</sup> In their latest Annual Report, published in January 2018, the Forensic Science Regulator stated that “without statutory powers to enforce compliance, the Regulator cannot guarantee that all science being used in the [criminal justice system] is being carried out to the required quality standards”.<sup>234</sup>

A 2015 report by the Government’s Chief Scientific Adviser, *Forensic Science and Beyond*, highlighted a number of challenges for the use of digital forensics including the availability of skills, the global nature of cybercrime, the scale of digital forensic investigations, the interface between digital information and physical information and the challenge of communicating this highly technical information throughout the justice process.

It is in this context that the Committee has decided to launch an inquiry into Forensic Science.

### Scope

The Committee’s inquiry will consider four broad areas:

- The contribution of forensic science to the delivery of justice in the UK and its strengths and weaknesses in doing so;
- The understanding and use of forensic evidence in the criminal justice system. The inquiry will look at the level of understanding within the criminal justice system and explore routes available to improve understanding by the judiciary, legal teams and juries, thus ensuring that forensic evidence, including digital evidence, is used effectively and robustly throughout the process;
- Standards and regulation, including the performance of the market for forensic services in the UK and the role of the Forensic Science Regulator;

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230 Technology Committee, *Forensic Science* (Second Report, Session 2013–14, HC 610)

231 Briefing for the House of Commons Science and Technology Committee, *The Home Office’s oversight of forensic services*

232 Home Office, *Forensic Science Strategy*, Cm 9217

233 *Ibid.*

234 Forensic Science Regulator, *Annual Report November 2016–November 2017*

- The forensic science research landscape, including the funding of research into forensic science, whether there is a need for new research programmes and what the focus of those programmes should be; and
- Digital Forensics—the detection, recovery, integrity, storage and interpretation of evidence from digital devices and networks in the investigation and prosecution of crimes.

### Questions

1. Is forensic science contributing to the delivery of justice in the UK?
2. What are the current strengths and weaknesses of forensic science in support of justice?

### Understanding and use of Forensic Science in the Criminal Justice System

3. What is the scientific evidence base for the use of forensic techniques in the investigation and prosecution of crimes? Are there any gaps in that evidence base?
4. How can the Criminal Justice System be equipped with robust, accurate and transparent forensic science? What channels of communication are needed between scientists, lawyers and the judiciary?
5. What is the level of understanding of forensic science within the Criminal Justice System amongst lawyers, judges and juries? How can it be improved?
6. Is the current training available for practitioners, lawyers and the judiciary appropriate?

### Standards and regulation

7. Is the current market for forensic services in England and Wales sustainable? Are changes needed to ensure forensic science provision is maintained at the level required? What are the risks of a market approach, for example what happens if a provider goes out of business? And what is the impact on quality?
8. Is the system of accreditation working successfully to ensure standardised results and the highest quality analysis and interpretation of significance of evidence?
9. What role should the Forensic Science Regulator have? If the Forensic Science Regulator is to have statutory powers, what should these be?
10. What lessons can be learned from the use of forensic science in Scotland and Northern Ireland? What can be learned from the use of forensic science overseas?
11. Is the 'Forensic Science Strategy' produced by the Home Office in 2016 suitable?

### Forensic Science research landscape

12. How should further research funding for forensic science be justified? What should be the focus of such research? What is the role of UK Research and Innovation, especially considering the interdisciplinary nature of much forensic science?

13. Where are the gaps in research and understanding of forensic science? How and by whom should the research questions be articulated to fill these gaps?
14. How can a culture of innovation in forensic science be developed and sustained?
15. Are there current or anticipated skills gaps? Who should have responsibility for and/or have oversight of training?

### **Digital Forensics**

16. Are there gaps in the current evidence base for digital evidence detection, recovery, integrity, storage and interpretation?
17. Is enough being done to prepare for the increasing role that digital forensics will have in the future? Does the Criminal Justice System have the capacity to deal with the increased evidence load that digital forensics generates?

23 July 2018

#### **APPENDIX 4: SEMINAR HELD AT THE HOUSE OF LORDS ON 4 SEPTEMBER 2018**

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Members of the Committee present were Lord Patel (Chairman), Lord Borwick, Lord Griffiths of Fforestfach, Lord Mair, Baroness Manningham-Buller (co-opted), Baroness Morgan of Huyton, Baroness Neville-Jones, Lord Vallance of Tummel and Baroness Young of Old Scone.

Presentations were heard from:

- Professor Ruth Morgan, Specialist Adviser for this inquiry, Director of the UCL Centre for Forensic Science;
- Professor Niamh Nic Daéid, Director of the Leverhulme Research Centre for Forensic Science at the University of Dundee;
- Dr Julie Maxton CBE, Executive Director of the Royal Society;
- Lisa Hall, Fingerprint Consultant Metropolitan Police; and
- Mark Stokes, Head of Digital Forensics at the Metropolitan Police.

**APPENDIX 5: COMMITTEE VISIT TO METROPOLITAN POLICE,  
DIRECTORATE OF FORENSIC SERVICES ON 16 OCTOBER 2018**

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Members of the Committee present were Lord Borwick, Lord Fox, Lord Griffiths of Fforestfach, Lord Hunt of Chesterton, Lord Mair, Baroness Manningham-Buller (co-opted) Baroness Neville-Jones, Lord Oxburgh, Lord Thomas of Cwmgiedd (co-opted) and Baroness Young of Old Scone.

The Committee visited the Metropolitan Police, Directorate of Forensic Services where they saw and discussed the operation of digital forensics, fingerprint analysis, biology and trace forensics, and forensic firearms analysis.