Keele University – Written evidence (FRS0081)

Our evidence to the enquiry is related to the thematic headings of *Forensic Science in the Criminal Justice System* and to *Research Landscape*.

**Research landscape**
Research in forensic science in the UK needs focus and leadership that would best be provided by an independent national institute (as was previously provided by the now-closed Forensic Science Service), that would 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. This would allow the re-establishment of a centre of expertise, free from the commercial interests of a private company, that would provide the long-term, stable focus for core research in the UK. As well as initiating their own research programmes, such an institute would 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. The close links between this institute, the police forces and the criminal justice system, in particular, would enable the development of forensic science to be closely linked to the needs of criminal investigation and justice, yet remain independent of these agencies.

There are three broad areas of forensic science research of current importance. The first is moving forward the frontiers of relatively new techniques and methods that are built on sound scientific and mathematical principles - most notably DNA profiling and the statistical evaluation of evidence using the likelihood ratio approach based on Bayesian inference. There are strong commercial reasons why research in DNA profiling is currently carried out by private forensic providers. However, because there is no saleable 'product' in the area of statistical evaluation, current research is limited to universities that are mostly outside the UK. Prior to its closure, the UK Forensic Science Service was world leading in developing approaches to the evaluation of evidence based on statistical methods.

The second broad area is to develop new approaches and apply new techniques to the analysis of evidence, more generally. Many universities are active here, as well as some commercial providers, and there are examples of collaboration with police forces once techniques become sufficiently developed. Again, most of this has had to be unfunded, as there are no calls for specific Forensic Science research by UKRI coupled with the demise of the Police Knowledge and Innovation Funds. However, the impact of a national institute would provide leadership in the initiation of new projects and more effective collaboration between both HEIs and practitioners through their coordinating role. Relatively few academics/practitioners do the bulk of research and this declining pool of experts is a cause for concern. This results in a limited number of individuals with the appropriate expertise that can be called upon to give evidence in the courtroom. This has clear implications when considering the ability to question ‘expert’ testimony. In addition, consideration should be given to providing resources for the validation of new technologies that show particular promise for
forensic investigations. Without this additional resource, many new technologies will never have sufficient testing to allow them to ever be reliably used in a courtroom.

The third broad area is to interrogate the scientific basis of some established areas of the discipline where legal debate in the courts, often on appeal, has shown that the absence of sound scientific principles underpinning that forensic evidence has led to failure of a prosecution case or indeed to miscarriages of justice. Evidence types within the so-called forensic identification sciences fall into this category; these include finger-marks, footwear marks, tool-marks and related impressions, observation evidence such as gait analysis and facial identification, as well as bloodstain spatter patterns and other blood mark evidence. There are very many academic publications, from the USA in particular, that are highly critical of current practice in the interpretation of identification evidence on the grounds of the methodology being 'unscientific'. Here the key issue is in the interpretation of such evidence given that the science underpinning the formation of the evidence is often superficially understood. Once again, research in this area is very limited in the UK and given the critical impact this may have on legal debate on such evidence types, a step-change in research activity is a priority which must be funded.

**Forensic Science and the Criminal Justice System**
The Criminal Justice System (CJS) requires sound science underpinning the analysis of evidence, coupled to a consistent and reliable methodology for interpretation and evaluation of that evidence. It is the latter aspect that is very often the subject of legal debate in the court and the role of the forensic scientist must be seen an encompassing the whole process, from the origins of the evidence at the crime scene through to the presentation of expert scientific opinion in the court. This implies that the forensic scientists and practitioners need to be competent across all aspects of this process and understand the need for consistency in the examination of different forms of evidence. Whilst the growth in Forensic Science programmes at UK universities has increased the pool of forensically trained scientists, it is important that they are fully utilised in the analysis and evaluation of evidence during a criminal investigation. It is vital that practitioners understand the complete ‘forensic’ process from the crime scene to the court. This ensures a complete understanding of concepts such as continuity of evidence, and how to articulate the results of complex analysis to some of the many non-scientifically trained individuals involved in an investigation. The Chartered Society of Forensic Sciences accreditation process for university degrees goes some way to contributing to this. It is important to realise that an individual who has a significant amount of experience and training in one type of analysis, in a non-forensic setting, will not always have an understanding of the forensic process their work contributes to. This can lead to costly complications later on in an investigation. A national institute could also play a role in ensuring that all practitioners contributing to an investigation possess a certain amount of forensic awareness.

However, even forensically trained practitioners need to be kept up to date and although the Forensic Science Regulator provides standards, their implementation through continuing profession development at the practitioner level is not coordinated or delivered in a consistent fashion. Once again, this aspect would be a function of a national institute.
Similarly, to fully appreciate and hence debate forensic evidence in court, the lawyers and judiciary need to understand the forensic process and, in particular, how interpretation and evaluation is carried out as this is often the crux of such debates. Although there have been some attempts at educating the legal profession, for example, through the Royal Statistical Society's Practitioner's Guides, with two primers, intended for judges, produced more recently under the auspices of the Royal Society's Science and the Law programme, there is clearly much more to be achieved here to ensure robust and accurate debate of forensic evidence in the courts. There are good examples of forensic primer publications in other jurisdictions; for example, the Science Manual for Canadian Judges produced by the National Judicial Institute (2013) and the US Reference Manual on Scientific Evidence (3rd Ed, 2011) from the Federal Judicial Center. In university law education, the inclusion of material specifically related to issues around scientific evidence and its interpretation and evaluation in particular, does not appear to be standard practice. Similarly, within forensic science degree programmes, the inclusion of relevant legal material is wholly dependent on individual university programme design. There is a clear need to encourage closer collaboration across the forensic science/ law divide within the university system.

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