**Keith Borer Consultants – Written evidence (FRS0061)**

**Introduction:** Keith Borer Consultants (KBC) is one of the UK’s largest defence-focused suppliers of forensic expertise. In 2017 our experts prepared over 2,250 reports on a wide variety of scientific, digital and engineering evidence types.

**Responses:**

1. **Is forensic science contributing to the delivery of justice in the UK?**
   In our experience, the answer to this is very much case and circumstance dependent. When findings are robust, interpreted by competent people and delivered in an effective manner, there is no doubt that the interests of justice are served by forensic science. In contrast, when findings are based on poor scientific foundation, interpreted by unqualified people or presented to the Courts inaccurately, the situation can be quite different. Limiting the scope of scientific investigations, restricting reporting practices to factual reports and reliance on non-scientists to interpret scientific evidence gaps (all of which are common features of modern forensic science deployment) increases the risk of miscarriages of justice.

2. **What are the current strengths and weaknesses of forensic science in support of justice?**

   **Strengths:**
   Arguably forensic science’s biggest strength is the people employed within the industry who strive to provide the CJS with a consistently high quality product in the face of a poorly funded forensic landscape.

   **Weaknesses:**
   Research & innovation: Research and innovation cannot be prioritised at a commercial level. With decreasing budgets there is limited scope for investing in future innovation and the key personnel needed to drive it. Latitude for recruitment of non-fee earning staff who might fuel innovation or add value in respect of emerging disciplines (for example statistics) is non-existent for small organisations.

   Commercial sustainability: Three Prosecution service providers have seen financial troubles recently, with Key Forensics going into administration and Intaforensics entering into a company voluntary arrangement (CVA) this year, and Forensic Telecommunications Services (FTS) going into liquidation in 2017. The drive to compel accreditation with an ever-widening scope exacerbates the financial challenges and in the defence arena, where funding has been reduced to 1990s levels, risks enforcing a commercially unsustainable model that restricts development and will ultimately leave the CJS with a lack of relevant expertise.

   Choice and Expertise: To survive in the current market, providers need to limit the services they maintain so as to remain financially viable. By way of example, fibre experts which are costly to train and accredit are becoming scarce due to low demand. There are a plethora of cases where fibre evidence will be more compelling than other evidence types, such as DNA, but because of the perceived cost they are not pursued. The power of evidence types like fibre evidence is the same today as it was 20 years ago, yet 20 years ago it was
routine and now is rarely seen. Reduced demand is leading to an irreversible skills loss. In the years to come it will be harder to provide these critical niche areas to the CJS.

Short Timeframes: The Justice system is pushing for shorter timescales yet the complexity of evidence often leads to late service of evidence and little time for either the prosecution or the defence to consider it fully. This leads to incomplete and rushed assessments, which sometimes only become apparent during the trial.

Funding: Achieving best evidence is a concept that does not align well with austerity. The drive to save money has, understandably, increased the amount of work that investigating bodies attempt to keep ‘in-house’. This raises quality concerns when the people doing the work are not trained to the same standard as others within the industry, or when reporting practices do not make clear the limitations of what is being presented. In defence supply, low funding has made it increasingly difficult to recruit and retain experienced scientists; a situation that can only worsen if operating costs and procedural demands continue to rise without a commensurate increase in revenue.

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?
There are two components to this question; whether the science itself is robust and whether the people performing the examinations and reporting the findings are competent to do so. Both need to be considered to understand if there are gaps in the scientific evidence base.

In general, scientific evidence types dealt with by mainstream providers, such as DNA, drugs and toxicology, involve well-established methods implemented by suitably trained personnel. Such evidence types are well characterised and understood, and, typically, findings are robust. Where issues present, these commonly concern the interpretation and limitations of the findings in the case context.

For examinations conducted outside mainstream providers, we see a greater variation in output quality and in the sustainability of the underpinning methods. By way of example:

Fingerprints: The Court of Appeal (R-v-Smith) and Fingerprint Enquiry, Scotland (Sheila McKie case) have highlighted that false positive matches in fingerprint comparison work are possible and made more likely by procedural weaknesses in Fingerprint Bureaux. Several studies have also shown a significant issue of cognitive bias. Fingerprints is seeing a shift in thinking toward a more statistical basis for matching but this is in its infancy; the USA seems to be leading this drive. Missing is core research into areas such as fingerprint longevity, secondary transfer and risk of false positive matches through bias, and how this can be prevented.

Fire investigation: This is based on well-established scientific principles but has seen a major move from forensic science providers to being done ‘in-house’ by the Fire Service or retrained Scenes of Crimes Officers. From our experience the
quality of the work in arson cases is highly variable, resulting in cases where people have been charged with arson despite evidence existing to support their innocence. The evidence gap comes from a poor understanding of fire investigation and lack of communication between the CPS, Police and Fire Expert. A gap analysis is required to consider if the current Code of Practice for fire investigation (Jan 2017) requires the demonstration of sufficient skills for someone to report as an expert in arson cases.

Toolmarks/Footwear/Ballistics: Blind studies in the USA have raised concerns over cognitive bias in the comparison of ballistics marks in evidence. As far as we know the UK has not engaged in blind studies to gauge error rates in mark comparison evidence.

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?
Streamlined Forensic Reporting (SFR) was introduced believing that it would simplify and expedite presentation of forensic findings, but in contested cases the streamlined approach commonly leaves the answers to critical interpretative questions (i.e. what does the evidence mean?) with those ill-equipped to address them. Early instruction of forensic scientists in all cases where a SFR stage 1 report is not accepted, through commissioning of a SFR stage 2 report and involvement of an independent defence-instructed agent, would ensure that scientific findings are presented and communicated to the Court in the most equitable manner possible; all too often we see cases going to trial with only the SFR1 completed. Earlier discussion with scientists, either on the part of the CPS or defence lawyers, will also assist with streamlining case progression.

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?
No comment.

6. Is the current training available for practitioners, lawyers and the judiciary appropriate?
No comment.

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?
The CVA for Intaforensics, administration of Key Forensics, liquidation of FTS and closure of Contact Traces Ltd demonstrates a significant level of volatility in the current forensic market. From the defence perspective this volatility can only increase if costly accreditation is enforced at the same time that the Legal Aid Agency refuses to award work based on anything other than lowest price. It is already challenging to recruit and retain people with appropriate qualifications and skills – particularly in the area of digital forensics where there is strong competition and far higher salaries available in other commercial sectors. It is to be anticipated that these pressures would multiply if accreditation costs were
mandated with no associated increase in revenues. Exit of a defence provider such as KBC from the market place would impact on CJS checks and balances and the quality of scientific evidence that is ultimately adduced into evidence at Court.

8. **Is the system of accreditation working successfully to ensure standardised results and the highest quality analysis and interpretation of significance of evidence?**

Accreditation regulates the processes through which scientific results are generated and communicated to a customer, but not how experts interpret scientific findings in the context of a case. Whilst the current system of accreditation provides an effective means through which independent assurance of the likely veracity of scientific results can be gleaned, one should not assume that this is fail-safe (as the failures seen with Randox Testing Services demonstrate), or the only means through which an organisation can demonstrate the validity of their processes. Similarly, one should not confuse the validity of scientific findings with the sustainability of expert opinion. In this regard there is the risk that accreditation can give a false sense of security.

The cost of accreditation, in its current form, is an impediment and must also be considered. The enforced modular approach 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. If accreditation is required to operate but funds do not allow, then cuts have to be made by reducing the range of services provided, reducing facility size/costs or reducing staffing; all of which can paradoxically have a negative impact on quality.

9. **What role should the Forensic Science Regulator have? If the Forensic Science Regulator is to have statutory powers, what should these be?**

Contextually, the remit of a Forensic Science Regulator falls into two camps: Policy Implementation and Policy Enforcement. Policy Implementation, through the Codes of Practice ("The Codes"), has progressed within the current framework and without the need for statutory powers. Policy Enforcement inevitably requires some degree of statutory authority, including the power to compel individuals and organisations to adhere to The Codes and impose sanctions when they don’t. It is important to caution, however, that smaller groups may struggle to satisfy the full requirements of The Codes not because of a lack of commitment to Quality but because of the complexity of The Codes and the limited resources, including finances, at their disposal. The impact of excluding such organisations, or discouraging appropriately qualified people from operating within the CJS, would need to be weighed against the risk to the CJS and liability if this was done in error. The checks and balances require careful construction to mitigate any such risk. As part of this an objective appeals process, allowing arbitration and mediation must be considered.

The FSR Bill focuses on criminal trials brought by the CPS but does not appear to have considered trials brought by other prosecuting authorities or criminal forensic work undertaken by other agencies such as the HSE, UKBA, Fire Service, local councils etc. It also does not take account of operating challenges
with the defence arena. All parties should be consulted to assess their state of readiness before the Codes of Practice become statutory.

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?

Our experience in Scotland is that forensic provision is coordinated under one body and seems organised in much the same way as the former Forensic Science Service in the 1990s. A reputed, and desirable, feature of this arrangement is that forensic scientists have a closer relationship with investigating officers and greater freedom to drive the scientific investigations. This comes, however, at the expense of increased backlog.

The USA accredits numerous forensic services from Federal, down to State and then city or town. The variation in type, size and layout requires proactive thinking and problem solving to meet ISO 17025/17020. The auditors are accustomed to variations in approach and working with those being audited to find solutions that meet the standard. Competing auditing bodies in the USA help to reduce costs through competition and encourage solution-driven results.

As a small UK operation, our experience with UKAS is much the opposite. UKAS has been deemed to be the only agency allowed to accredit within the UK forensic arena (despite ISO being an International standard) and their general approach has been to follow what large forensic laboratories do and not to entertain variations. This has hampered areas of potential growth for small operations in this tough market.


The 2016 strategy is entirely focussed on forensic science provision driven by the police; no attention is given to the defence arena or other prosecuting bodies. This is somewhat troubling as the wider implication of the strategy, and in particular the call for far-reaching accreditation, will impact heavily in these areas.

The strategy presents a vision for the future, but gives little indication of how, in practice, this might be achieved. Some aspects of the call for a ‘National approach…proposed and delivered by police forces’ have the feel of a retrograde step which will challenge commercial viability and the innovation independent forensic service providers bring to the marketplace.

Spending by police forces on external forensic service provision is indicated to have fallen from £140m in 2010/11 to £80m in 2015/16. This is hailed as a marker of the success of the procurement process. A study is, however, needed to address whether the reduction in spending on traditional forensic science is impacting case progression or outcome.

The strategy envisages all forensic services to the police to be accredited but does not recognise the need to have available non-accredited forensic science provision for non-mainstream issues. There are cases which require bespoke analyses and services where accreditation would not realistically be possible. By requiring all work to be accredited, critical forensic work may not be done.
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?

Funding for research in forensic science should be justified by the benefits it can bring to the CJS. Ten years ago the UK was contributing to better justice and leading the world in forensic innovations such as Low Copy Number DNA profiling, but today we contribute only minimally to the developing sciences. In the interim, others have established themselves as leading authorities, a shining example being the state run ESR laboratory in New Zealand and their STRmix™ advanced probabilistic genotyping software.

Although research is conducted within universities this is, in our experience, seldom focussed on relevant issues and rarely makes its way out into the operational arena. Efforts should, therefore, be made to ensure that research has practical application and research funding is accessible to those working in the field. Where possible, a portion of research effort should be devoted to establishing foundation studies and validity of developing techniques for all to access which will help create common methods and associated reduced costs.

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?

This question is too broad to answer specifically – there is always research to be done in forensic science.

14. How can a culture of innovation in forensic science be developed and sustained?

As long as businesses and agencies are at the mercy of funding reductions, inflexible accreditation regimes and short-term contracts innovation will be stifled.

15. Are there current or anticipated skills gaps? Who should have responsibility for and/or have oversight of training?

Skill gaps are an inevitable consequence of underfunding. It is expensive to maintain accreditation and employ competent staff in low throughput subject areas. As a consequence, the skills range of operational scientists is reducing and there is no obvious road map for redress. In a commercial world, the decision of which services to offer has to lie with the individual organisation, given that demand and rates paid by funding bodies such as the LAA/HMCTS do not necessarily correlate. Whether or not the ‘lost’ sciences are something that should, in some way, be preserved (for example through subsidies) should be debated.

16. Are there gaps in the current evidence base for digital evidence detection, recovery, integrity, storage and interpretation?

The forensic tools, methods, and procedures to enable the efficient progression of a case from seizure to reporting of digital evidence all exist; it is a matter for each organisation to ensure they are implementing them effectively. In relation to interpretation, the SFR system is frequently misused to adduce digital evidence. Although not intended to comprise an evidential report the SFR1 is
often the only technical evidence cited by the prosecution; however, by design, the SFR1 does not normally contain technical interpretation. This can leave the Court to interpret highly technical and potentially ambiguous evidence unaided. Better adherence to the SFR process would greatly assist justice.

A successful examination of digital evidence requires active co-operation between the examiner and the investigator and the ongoing sharing of information between the parties. Subjectively, the impression is that these parties often work in isolation, to the detriment of the end product. Many of the recent digital disclosure issues reported in the press are wrongly attributed to forensic failures, as forensic processes had actually recovered the pertinent evidence. The issues lay with disclosure and proper consideration of this.

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?

The current market is notably volatile due to the pile it high / require it cheap approach to digital evidence which appears to be the norm in much outsourced prosecution work. Unfortunately much of this low cost work is also of low quality leading to frequent misunderstanding and misstatement of the value of digital evidence at Court. There are too few computer scientists inclined to work in this area of public service due to the low salary levels afforded, certainly in comparison to hourly rates paid elsewhere in the IT sector.

14 September 2018