Forensic Geoscience Group – Written evidence (FRS0012)

Executive Summary

The Forensic Geoscience Group is a National Specialist Sub-Group of the Geological Society of London. We are a not-for-profit organisation, the FGG committee comprises of mostly applied geoscience academics at UK HEI’s. Our stated aims are to: (1) advance the study and understanding of Forensic Geoscience; (2) to create a network and framework of geoscientists; (3) to review and share knowledge; (4) to develop inter-disciplinary collaboration; and (5) to disseminate knowledge and information in the area of Forensic Geoscience.

The three key issues that we would like to bring to the attention of the committee are: (1) the potential strengths that evidence-based and unbiased Forensic Geoscience can bring to the delivery of justice in the UK. However, the (2) lack of funding opportunities (in comparison to other research fields) have stymied research in this area to both assist Police practitioners and routinely bringing Geoscience into use in the courts. We therefore wish to address this inquiry, using the same question numbering system as given in the inquiry guidance:

1. Is forensic science contributing to the delivery of justice in the UK?

Forensic science is fundamental to the delivery of justice in the UK, as it should be globally. Forensic Science spans a whole host of different approaches and methods, and Forensic Geoscience (like many other domains) is currently hampered by the lack of evidence-based research. It is essential that research is undertaken to support each forensic domain. Examples of research need within forensic geoscience would include controlled studies, for example, simulating a buried murder victim, using an animal proxy, then determining the optimal detection technique(s) in different depositional environments, would result in comparison datasets and give confidence that evidence presented was undertaken to the best standard.

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

Strengths: In several domains, Forensic Science analysis that identifies a substance/material is robust and repeatable – so for some existing areas it is very strong, based on well established theory, experimentation, observation and analysis by specialists in that sub-field, which should give confidence in evidence presented pertaining to source level attributions.

Weaknesses: The demise of the UK’s Forensic Science Service (FSS) and privatisation/consultancy in England/Wales has made Forensic Science a money-making venture in some organisations, which can then result in being reactive in mode, under significant time-pressure and thus not conducive to reflection,
experimentation or sometimes scrutiny, which has knock-on effects when presented in court. The application of potentially untested or low evidence based scientific techniques, to support criminal justice investigations, is dangerous. Whilst these techniques may be suggested as options on the basis of a proportionate assessment of existing best practice, such techniques need to be thoroughly examined and researched to develop an appropriate body of evidence that will then support the decision makers. This research requires support and funding to ensure that this cutting edge science supports the objectives of criminal justice. The lack of evidenced-based research in Forensic Geoscience is hampering its use/effectiveness.

3. What is the scientific evidence base for the use of forensic techniques in the investigation and prosecution of crimes?

For the Geosphere (which covers the ground, land, soil, sediment and water), where crimes occur and can be used for evidential purposes, it is comparatively (compared to fingerprints) the least well-researched, which represents serious issues given its potential to be used routinely for both search and trace evidence purposes. Thus there is a real need for well-funded, evidence-based research in this area to be undertaken to provide greater confidence in outputs from this sector. Some excellent context databases exist, which are necessary for data evaluation, but usually these are held by individual practitioners due to commercial sensitivity.

4. How can the Criminal Justice System be equipped with robust, accurate and transparent forensic science?

The duty of an expert is to serve the court, not the paymaster. The FSS did have a system to monitor outputs which is now defunct. The National Crime Agency (NCA) currently has an Expert Advisors database, which does list practitioners undertaking cases/outcomes etc., but it does not provide governance, and not all practitioners either use it/or are on it. A lot of work in our area is by contacts/word of mouth, which obviously is not ideal. There also needs to be better channels of communication 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?

Our area is a niche specialism in which lawyers, judges and juries may have less experience and as such provision of training or a guide to this area would be beneficial.

7. Is the current market for forensic services in England and Wales sustainable?
Our American cousins are always asking this: they were fascinated as to how privatisation of Forensic Science services in the UK would work. From members’ experience, there appears that there is a significant reduction in police budgets for any Forensic Science which is not “core” activity and therefore covered through an existing contract for Forensic Science services. None of the main UK FS companies have any in-house Geoscience Forensic Science staff or expertise, although two do have high quality standards and reputations. Commonly only a few experts do the majority of casework, whilst others do research – there is some disconnect between the two. Commissioning of work appears to be at the lowest level in the last ~15 years. Consequently it is likely that this area of provision will no longer exist in the future, with declining numbers of experts, practicing academics and commercial providers.

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

This is a big issue currently, accreditation by whom and for what? In our sub-discipline The Geological Society of London accredits Geologists/Geoscientists through degrees/CPD/training/peer evaluation of published outputs (arguably some do not get published for sensitivity reasons) which leads onto Chartership, but that is as geoscientists, not as forensic scientists. We understand that there is some discussion for UKAS accreditation of forensic labs which would be useful for the trace evidence experts analysis practices, but this does not address the issue of expertise of individual scientists, and is not relevant for the search experts.

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?

The Northern Ireland (NI) lab was often criticised for being located in a police facility (for security reasons), and thus not being independent/impartial. However, with the privatisation in England & Wales, we now see the different Police Forces setting up (or have set up) their own forensic service labs, which may appear a retrograde step and a repeat of what happened in Derbyshire, the Met and others through the 1930s.

In Scotland the mid model has been adopted where the Scottish Police Authority (main Forensic providers) run as a separate, but related organisation to Police Scotland. For mainstream forensic work they are called to attend the scene and provide expert/fact statements. It allows impartiality and independence of the police while allowing true integration in Forensic case strategy meetings. In the Geoscience area the Scottish Institutes provide scene attendance if required, advice, training and bespoke analytical labs with related databases for Scotland. They work closely with SPA and jointly run training courses, although money to assist this would be appreciated. They also bring in recognised external providers where expertise is not in house.
Various models exist globally but of note is the European Network ENFSI, the Netherlands NFI and police linkages, US and Australia (again variable models across states) for forensic geoscience integration with Policing and the CJS.

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?

Evidenced-based research in Forensic Geoscience areas, both for search and for trace evidence, would be a clear requirement here, with a specific funding call with the now combined RCUK funding gives an opportunity for this, which has not been available to-date. A Doctoral Training Centre in the forensic geoscience area would be funded, specifically calling for multi-institution proposals to ‘pool’ UK expertise, to train the next generation of Forensic geoscientists to replace the aging remaining experts. A post-doctoral funding call should also be formed, with key knowledge gap areas identified (see Qn. 15).

The one time EPSRC ran a proposal call which was relevant, the ‘Think Crime’ funding call in 2008, the multi-Higher Education Institutions/National Crime Agency/Forensic Science Service SoilFit and GIMI projects were generated. In these projects, the Macaulay/James Hutton Institutes accelerated and strengthened the soil forensic science base and raised awareness on what Forensic Science could and could not deliver. The outcome is that they have arguably the best resourced and accredited soils lab that carries out forensic geoscience analysis in the UK, the number of related crimes solved and Prof Lorna Dawson being honoured as a CBE as a result of this funding and the dedication and ability to utilise match funding from Scottish Government-related projects. Prior to this time much of the Geoscience work was ad hoc and lacked quality standards. Queens University Belfast and Keele universities have driven forward the provision of search tools, with evidenced-based research, although this has largely been unfunded and therefore difficult to sustain.

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

In evidenced-based research (which the Police now hold as a Gold Standard), a pyramid structure should be developed. At the top, regular call for proposals (as in other disciplines) should be generated, with the expert committees looking at specific gaps in current knowledge; for example, in search, simulated clandestine burial research in different depositional environments. Police practitioners should also be involved, with the feeding back of results of actual active searches (both successes/failures) to inform future search/improved research capacities. This is being undertaken by some researchers in UK Universities but is currently piecemeal by the chronic lack of funding. Combined research, using either HEIs or others, could look at the same problem in different areas to ensure that non-unique results can be applied to future cases/research – too often research is
being undertaken in silos with little multi-user group research being undertaken, again the lack of funding being the central issue here.

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

In our area, there is a current chronic lack of eager young minds entering forensic geology/geosciences. A common question at schools/UCAS events is – ‘how can I become a forensic geologist?’ Students can undertake research projects as part of BSc/MSc studies, but PhD funding is challenging, as mentioned, a dedicated Doctoral Training Centre would be valuable. Post-doctoral Forensic Science positions also do not currently exist and therefore few academics are coming through, to replace the limited number currently working this field. A funding call should also be undertaken. Further training could be undertaken in HEIs, which could follow the NERC Short course model.

To increase awareness and understanding, CPD training for Police Force personnel and indeed the judiciary could be valuable and undertaken as part of the National College of Policing training programme. In England and Wales forensic practitioners carry out awareness training sessions for SIOs and CSMs and in Scotland this also takes place at least annually (although these are inevitably time and resource dependant) for SIOs and SPA forensic staff. If funding was available, such courses could be more integral to CPD of related staff. For the judiciary, forensic geoscience primer as part of the Royal Society primers project could be valuable.

3 September 2018

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