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Interfaces

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Beyond Forensic Science

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Forensic science is not a single area, but a collection of diverse disciplines, relating science and analysis to investigation of (potential) crimes. Data, processes and decisions need to be robust and stand up to challenge in a court of law.

As such the forensic science profession requires people with a range of skill sets, and equips graduates and practitioners with the knowledge and experience to extend their work into a wide choice of careers. A Chartered Society of Forensic Sciences conference at Strathclyde University in November 2019 explored entry points into forensics, unconventional or lesser-known forensic disciplines, and application of forensic principles “Beyond Forensic Science”.

Major Steve Johnson of Cranfield University and the UK Army, featured government analysis and intelligence, with particular emphasis on Chemical, Biological, Radiological, Nuclear and Explosives (CBRNe). A first thought may be nerve agent poisonings, such as novichok in Salisbury, with the importance of remote sensing of trace evidence, and contamination control protecting the public and officers from the scene. Forensic Scientists input is needed in developing instrumentation and detection protocol. There is still a need to identify uncorrupted evidence, to enable treatment and decontamination, and to assess potential crimes – a need for Scenes of Crime Officers. Now apply this to a warzone. With limited kit and services, danger from hostile forces; opportunities in the Army for people who know how to deal effectively with controlled scenes. Or apply this to a humanitarian disaster: providing food and water; identifying, isolating and treating disease, avoiding contamination, all with limited or no infrastructure and desperate people struggling to survive.

All these activities involve collecting signals, translating these to data, processing these to produce information, and using this to make a decision. Forensic Scientists can do this in a robust way, and work to develop the instrumentation, process and understanding at each stage. This can be for crime scenes, or for environmental, or analytical measurement and interpretation.

Frances and Mark Senior, specialists in Forensic Collision Investigation (FCI) with national police chiefs and Yorkshire and the Humber regional scientific support services (RSSS), showcase a little known forensic discipline. Applying physics, mathematics, and crime scene investigation to collision analysis. Analysing pathways, breaking distances, and trajectories enables understanding of the collision scene. A striking

example shows a spectacular car crash; the driver survives, but children in the car are found dead. Examining the apparent injuries shows some incompatibilities with the collision dynamics. An analysis of skull injuries shows that the children were killed with a hammer blow, and the car then crashed to (attempt to) hide the evidence. The investigators discuss cognitive bias in this context and its further relation to collision investigations, as well as the need to appreciate errors and uncertainties in instrument use and in understanding potential sequences of events.

Other examples from the meeting include pathology, gait analysis and mapping. A development from forensics, enabling visualisation of information across a crime scene, can be translated to manufacturing, or the oil and gas industry; real time data spatially represented to aid decision making as shown by Laura Fairley of James Fisher, a forensic scientist now working in market development.

A short survey of recent forensic graduates showed 8% working in forensics, but over 80% working in scientific disciplines. Forensic Scientists are analytical, articulate and adaptable, exhibiting the key requirements for a wide range of careers.

Dr Ben Jones is a Trustee of the Chartered Society, a Fellow of the Institute of Physics, has published development of forensic techniques with the UK Home Office, and teaches on environmental, biomedical and forensic science courses.