INITIATIVE ON FORENSIC GEOLOGY

British Science Festival in Bradford, United Kingdom

'Sherlock Holmes to CSI - How Geologists Help Solve Crimes'

Members of the Geological Society of London Forensic Geoscience Group (FGG) and the International Union of Geological Sciences (IUGS), Initiative on Forensic Geology (IFG) present at the 2011

Tuesday 13 September 2011

FGG and IUGS were pleased to take up the challenge when Sarah Day from the Geological Society of London invited the group to present at the 2011 British Science Festival, hosted by the University of Bradford. FGG presentation headline message was how forensic geology has played a key contributory role in several high profile criminal cases, in the UK and internationally, a role which continues to grow.

There were several key questions that the group addressed, namely:

- When did forensic geology begin?
- What does the scientific discipline of forensic geology involve and how and why has it developed over the last 10 years?
- How do recent advances in analytical techniques allow us to describe and analyse soil on, for example, a shoe and find its provenance?
- How may geologist assists in the search for criminal burials, such as victims of murder, who may have been buried in an unmarked grave?
- How can geological data and information help by providing evidence in court?

A series of related talks were delivered to address these questions.

Media interest in the work of FGG and IUGS IFG started early when Prof Lorna Dawson from The James Hutton Institute, was asked to give several media interviews including the Naked Scientist, Then Science Show and the Irish Times. Dr Alastair Ruffell, Queen's University, Belfast, joined Lorna later for an interview from The British Science Association reporter Andy Wright, and from the Guardian.

Following an impromptu round table interview blog with Sarah Day for the Geological Society London webpage (photo and link), the team began the work of finalising the series of multi-disciplinary but inter-related presentations to ensure that the headline message was clear and that each talk flowed seamlessly from the one before. Most exciting was seeing how an interactive session planned for the end of the day started to take shape, with each member providing additional slides and ideas to supplement the initial outline draft from QUB.

One of the lasting memories from the seminar is the creative energy and buzz generated as each member of the team delivered their presentation and received feedback and input on their work from the group.

As the lecture room filled with an expectant audience, with ages ranging from 8 years to more senior figures, Dr Jenny McKinley welcomed everyone and introduced the first speaker, Dr Laurance Donnelly, Chair of FGG & IUGS IFG, based at Wardell Armstrong.

Laurance (photo) established the theme for the series of talks tracing Forensic Geology as far back as the middle part of the nineteenth century, recounting how forensic geology has experienced a global renaissance since the millennium. Laurence's presentation explored the reasons for the revival in forensic geology, attributing this to a number of factors including: a presentation on forensic geology which was delivered in the House of Commons, Houses of Parliament; in 2002; increased media and public interests, raised awareness within the police and law enforcement agencies; advances in the profession of forensic geology and in scientific research and increased numbers of techncial meetings, conferences and publications..

Dr Duncan Pirrie, Helford Geoscience LLP, went on to set the scene for the 'story in the sand'. The audience listened intently as Duncan described (photo) how an individual walking in a landscape may be unaware that sand grains become lodged on their clothing. Translate this to a crime scene and the query arises 'Surely one sand grain is the same as any other? Duncan described how using cutting edge technology and an understanding of geological processes and environments, the forensic geologist can unravel the story in the sand.

QEMSCAN is one such cutting edge technology referred to by Duncan who explained how this technique can be used to investigate questions such as: What type of environment, landscape and climate was the sand grain from and where in the world did our sand grain come from?

Dr Lorna Dawson from the James Hutton Institute (photo) took up the story in the sand next, and introduced the idea that sand, silt and clay may provide vital clues as to the origin of a sample. More specifically, Lorna described how soil is a matrix of inorganic and organic compounds, each with their own story to tell. The organic (or plant and organism derived) can be in various stages of decay. Using various methods to help characterize this material, links can be made to a specific habitat, such as a crime scene. Artefacts can also provide important contact trace evidence.

The last talk in the 'story in the sand' was presented by Drs Jenny McKinley and Alastair Ruffell (photos) from the School of Geography, Archaeology and Palaeoecology, Queen's University Belfast. Jenny and Alastair used examples from actual crime case studies to explore ways and techniques, including Geographic information systems (GIS) to ask whether grains of sand in soil taken from a crime scene can be compared to locations of last known movement of the victim and suspect(s).

The last part of the day involved an interactive crime scene investigation using examples of trace evidence and techniques discussed throughout the series of earlier talks. It was particularly heartening to see the level of engagement from the audience (in particular from children and younger members) and the types of interesting and provocative questions posed throughout the session.

Later that evening Laurance was interviewed at the X change and an audio clip of this debate is available to listen to again.

The x-change was a more informal part of the day, which discussed and reflected on some of the more topical and popular workshops and presentations. Forensic Geology certainly seemed to grip the imagination of the delegates as this was chosen for further discuss and debate. Laurance was interviewed

in the evening at the x-change and an audio clip of the debate is also now available to listen to at http://www.britishscienceassociation.org/web/ScienceinSociety/x-change/x-change+2011.htm

During the interview at the x-change Laurance was asked to explain, 'what is forensic geology' and 'how can geologist assist the police in their investigations of certain types of crimes'; be it trace (geological) evidence or search. Questions from the delegates and the discussions that followed were varied. Some focussed on the longevity of geological trace evidence on clothing and how this may be detected and analysed , whereas others were interested in search techniques to locate burials and in particular graves. The recent popularisation of forensic sciences on TV and film, and in the media, also clearly had a positive influence on the perception of those who attended the x-change. This must be good for the longer term benefits of forensic and the forensic geology professions. Events such as the British Festival of Science and the x-change session clearly may be attracting the next generation of forensic geologists and forensic scientists.

Thanks to all who took part. In the words of one former sleuth, "this was far from an elementary discussion my dear Watson!"

- http://www.thenakedscientists.com/HTML/content/news-archive/news/2381/
- http://www.guardian.co.uk/science/blog/2011/sep/13/forensic-science-content-transference
- http://www.irishtimes.com/newspaper/ireland/2011/0914/1224304082341.html
- http://www.britishscienceassociation.org/web/News/FestivalNews/Forensicgeologysolvesdirtycrimes.htm
- http://www.britishscienceassociation.org/web/ScienceinSociety/x-change/x-change+2011.htm