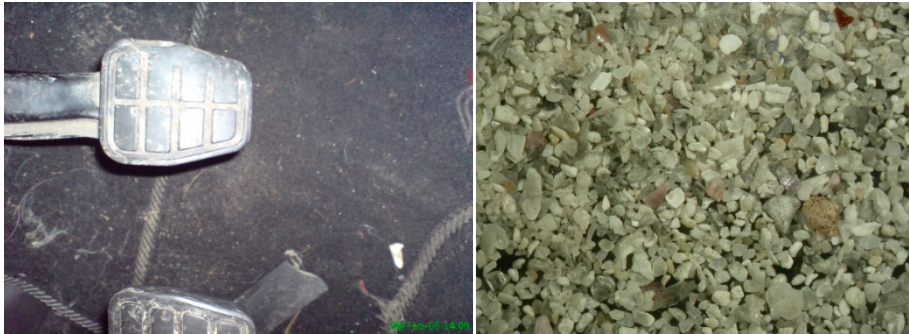


Members of the FGG and IUGS present at the 2011 British Science Festival in Bradford, UK:

‘Sherlock Holmes to CSI - how geologists help solve crimes’

Tuesday 13th September 2011, 3.30 - 5.30pm



The story of the sand on the foot pedal

The Forensic Geology Group (FGG) and the International Union of Geological Sciences (IUGS) Initiative on Forensic Geology 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. The 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:

- 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?
- And how can the geologist assist in the search for criminal burials, victims of homicide or natural disaster?
- How can such geological information help in providing evidence in court?

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

Media interest in the work of the FGG and the IUGS Initiative on Forensic Geology started early when Prof Lorna Dawson from The James Hutton Institute, was asked to give several media interviews including the Naked Scientist, The Science Show and the Irish Times^{2,3}. Dr Alastair Ruffell, Queen’s University, Belfast, joined Lorna later for an interview from The British Science Association reporter Andy Wright, and from the Guardian⁴.

Following an impromptu round table interview blog¹ with Sarah Day for the Geological Society London webpage the team began the work of finalising the series

of connected 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 Queens.



Sarah interviews the group

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 of Queens University Belfast welcomed everyone and introduced the first speaker, Dr Laurance Donnelly, Wardell Armstrong LLP.

Laurance 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 an increased media interest, raised awareness within the police and law enforcement agencies and advances in the profession of forensic geology and research.



Laurance starts off with the history of forensic geology in the world

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 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.



Duncan describes how QEMSCAN can provide provenancing information

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 took up the story in the sand next, and introduced the idea that sand, silt and clay all 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.



Lorna illustrated the role of organic soil components in intelligence and evidence

The last talk in the 'story in the sand' was presented by Drs Jenny McKinley and Alastair Ruffell 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).#



Jenny displayed the use of GIS in search



Alastair showed examples of application of forensic geology in case work

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 and the types of interesting and provocative questions posed throughout the session. Later that evening Laurance was interviewed at the X change⁵ and an audio clip of this debate is available to listen to again.



The audience interacted well with consideration of much detail

Thanks to all who took part. In the words of one former sleuth:

"This was far from an elementary discussion my dear Watson!"

1. <http://www.britishecienceassociation.org/web/News/FestivalNews/Forensicgeologysolvesdirtycrimes.htm>

2. <http://www.thenakedscientists.com/HTML/content/news-archive/news/2381/>

3. <http://www.irishtimes.com/newspaper/ireland/2011/0914/1224304082341.html>

4. <http://www.guardian.co.uk/science/blog/2011/sep/13/forensic-science-content-transference>

5. <http://www.britishtscienceassociation.org/web/ScienceinSociety/x-change/x-change+2011.htm>