2.3. Natural Justice: The Role of Soil in the Provision of Intelligence and Evidence
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Learning objectives:
By the end of the presentation, participants will be able to:

1. Understand the use and importance of soil in intelligence and search operations
2. Explain the role of forensic soil science trace evidence analysis in evaluation and evidence provision in serious crimes
3. Understand the principles of how the science of biomarkers is assisting in finding buried human remains

Abstract:
Forensic soil science is an increasingly important discipline, involving soils, minerals, dusts, plants and rock fragments to determine provenance i.e. to provide a chronology of their ownership, custody or geographic location. Soil materials (and pollen and plant fragments within the soil) have been used as forensic trace evidence for a long time, with a history of use in Roman times, and are often highly distinctive from one region to another. Such traces are extremely useful in a forensic context, because of their environmental specificity; their high levels of transferability; their ability to persist on items such as clothing, footwear, tools and vehicles; and their high levels of preservation after long periods of time. This resilience makes soil trace materials, frequently present at crime scenes and forensic exhibits, highly valuable forms of intelligence and evidence that can aid crime investigations and crime reconstructions and help deliver justice.

Sediments/soil and vegetation on footwear and vehicles can indicate where a crime may have taken place, and may provide evidence of a person being at a particular place of interest. Improved analytical capabilities, coupled with the development and availability of relevant databases, and Geographical Information Systems, allow forensic geoscientists to help police to search for unknown objects or missing people, prioritise areas for investigation or search, and ultimately provide robust and reliable evidence in court. Forensic geoscience has mainly been used in the past in the context of high-impact crimes such as murder, rape, aggravated burglary and terrorism investigations, where resources allow it. However, with developments in analytical technology, and an increasing understanding of how soils and sediments are distributed within natural and anthropogenic environments, forensic soil science has more power to answer questions such as: “Where did the soil material come from?”, or “Where has this item been?” Understanding the context of a specific case is crucial to help answer such questions. In addition, being able to explain the significance of the evidence that has been analysed, and demonstrating...
logically how a conclusion has been reached, remains important for forensic soil science specifically and trace evidence generally.

The talk will discuss examples from case work, were evidence from the earth has been of importance in helping to investigate and to help bring about natural justice.