Geophysical Research Abstracts
Vol. 12, EGU2010-5453-2, 2010
EGU General Assembly 2010

"Interred with their bones" - linking soil micromorphology and chemistry to unlock the hidden archive of archaeological human burials

Don Brothwell (1), Maria-Raimonda Usai (1), Brendan Keely (2), Matt Pickering (2), and Clare Wilson (3)

(1) University of York, department of Archaeology, King's Manor, York YO1 7EP, United Kindgon, (2) University of York, Department of Chemistry, Heslington,York YO10 5DD, United Kingdom , (3) University of Stirling, School of Biological and Environmental Sciences,Stirling FK9 4LA, Scotland, United Kingdom

"Interred with their bones"
Acronym: InterArChive - an ERC-funded project

***
" Friends, Romans, countrymen, lend me your ears;
" I come to bury Caesar, not to praise him.
" The evil that men do lives after them;
" The good is oft 'interred with their bones';
" So let it be with Caesar.

William Shakespeare,
Julius Caesar, Act III, Scene 2.

***

Background
The state of decay within soils in archaeological graves is often such that degradable objects are not preserved in a condition that can be visually recognised. However, microscopic soil features, inorganic element distributions and organic residues can be measured. Thus, archaeological burial soils have the potential to reveal signatures of decay; pre-burial treatment; presence and nature of associated clothing and perishable artefacts; diet of the individual; cause of death; evidence of morbidity and drug-use.
Aims
• To develop and test a multidisciplinary approach linking soil micromorphology and chemistry to recover environmental and cultural information;
• Revealing the hidden archaeological archive within the burial soil
• Developing soil sampling and analysis recommendations for archaeological human burials

Methods

1: Sampling and soil field description from archaeological sites contrasting in soil, geology, age, and culture and from experimental piglet burials

2: Microscopic/micromorphological analysis (micro-scale observations) of remains and features in burial soils. We will establish the order of occurrence, spatial patterns, displacement, mode of formation and decay of micromorphological features including exotic components, parasites, hair and remnants of footwear and clothing [cf. pilot study of soils from Yemen]; microfabrics and textural pedofeatures, also to facilitate resolution of body decay products from other accumulations.

3: Microprobe analysis (nano-scale) will generate elemental maps of soil thin sections, allowing identifica-

tion of features with distinct chemical signatures, including those not identifiable by micromorphology.

4: Organic chemical analysis: Organic residues will be analysed by gas (GC) or liquid (LC) chromatography and selected fractions by mass spectrometry (MS; GC-MS and LC-MS). MALDI imaging will produce image maps of the soil sections with false color images representing lipids, proteins and peptides

Relevance of the research and expected results

This soil study will reveal hidden secrets that inform understanding of cultural practices of and environmental conditions experienced by past civilisations. It will deliver a comprehensive inventory of soil morphology and chemistry for a wide range of archaeological human burial environments, linking morphological and chemical characteristics both at a general level and at a level that visually and chemically resolves individual microscopic remains.
Thus, excavation of archaeological human graves, for cultural reconstruction and to understand mortuary practices, archaeological burial practices and aspects of human health, will be enhanced dramatically.