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**Ethno-geochemical studies of activity related chemistry patterns and their application in Neolithic archaeological site interpretation**

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The combined analysis of geochemical methods and observations derived from ethnographic material offers a significant opportunity to investigate the impact of human activity on structural 'spaces' (Derham *et al* 2013). In this paper we explore portable-XRF derived elemental variations and comparisons with data obtained from ethnographic oral histories of a recently abandoned village of Ma'tan in Jordan as part of the INEA project (Identifying activity areas in Neolithic sites through ethnographic analysis of phytoliths and geochemical residues). The aim is to understand how particular activities and building practices e.g. hearths, food storage and plastering leave behind identifiable signatures that reflect the formation processes. We consider if these characteristic signatures can help us identify the same activity types in the archaeological record. This is especially important for early Neolithic sites in Jordan, where the preservation of biological archaeological remains is often poor.

The geochemical results distinguish between background sedimentary material and elevated or deflated levels of significant elemental constituents. There are clear geochemical signatures for hearths, animal occupations and special plastered features. From preliminary comparisons to archaeological data obtained from similar activity areas, it appears that elemental concentrations are not entirely comparable between modern and archaeological material for the Neolithic settlements examined to date. The impact of 7,000 years of chemical alteration may have resulted in archaeological samples that are more homogenous than the abandoned village samples.

Derham, B., Doonan, R., Lolos, Y., Sarris, A. & Jones, R. E. 2013. Integrating geochemical survey, ethnography and organic residue analysis to identify and understand areas of foodstuff processing. In: S. Voutsaki & S. M. Valamoti (eds.) *Diet, Economy and Society in the Ancient Greek World. Towards a Better Integration of Archaeology and Science*. Leuven: Peeters, 47-54.