Archaeologia Polona, vol. 53: 2015, pp. 438-439

The Gokstad Viking Age trading site: a voyage of physicochemical prospection

Rebecca Cannell[a], Jan Bill[b], Paul Cheetham[a] and Kate Welham[a]

KEY-WORDS: geophysics, geochemistry, pXRF, Gokstad, Viking Age

Near-surface geophysics can now provide accurate, high resolution, three-dimensional interpretations of archaeological features beneath the topsoil. Rapid, large-scale surveys record complex, interconnecting sites and landscapes, but our interpretation is all too often limited without additional intrusive excavation to confirm the range of past activities, the phasing and dating of the sites, and the evidence of trade and connections to places near and far. To enhance geophysical interpretation, coring and geochemical prospection was combined with high-resolution GPR data on the site of Heimdalsjordet, located just 500 m from the contemporary Viking ship burial at Gokstad, Vestfold, Norway.

The site was recorded in detail using large-scale high-resolution ground penetrating radar (GPR) by ZAMG Archeo-Prospections in collaboration with the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology (LBI ArchPro), the Vienna Institute for Archaeological Science (VIAS) in collaboration with the Norwegian Institute for Cultural Heritage Research (NIKU), with support from Vestfold Municipal County administration. The Gokstad Revitalised Project, a body which initiated the survey, is a research project managed by Prof. Jan Bill at the Museum of Cultural History, University of Oslo, aiming at setting the Gokstad ship burial in a social, cultural and landscape context. This research is part of the project, focused upon the proto-urban trading site of Heimdalsjordet.

The clearest settlement evidence on the site is in the form of parcel ditches, dug for drainage and to divide the land on either side of an east–west orientated thoroughfare. The site was truncated by ploughing, leaving the parcel ditch backfills as the prime source of information, alongside artifacts from a comprehensive topsoil survey. Guided by the GPR results, small scale excavation investigated several of the parcel ditches, as well and one of the several potential burials. Using a 5 cm ø corer, intact cores were taken from parcel ditches during the excavation. In order to expand the understanding of the site beyond the excavation boundaries, cores were taken from unexcavated parcel ditches, the core locations successfully guided by the geophysics data. Thus, the sampling and prospection method is designed to be minimally intrusive.

Geochemistry offers the opportunity to measure directly where an activity took place, and what was the source of the inorganic (and organic) traces in the soil, however the method is not without challenges with regard to interpreting complex and environmentally dependent chemical signatures. The method requires large sampling numbers and detailed understanding of the local soils to improve the quality of geochemical interpretation. Using portable X-ray

[a] Department of Archaeology, Anthropology and Forensic Science, Faculty of Science and Technology, Bournemouth University, Bournemouth, United Kingdom
[b] Museum of Cultural History, University of Oslo, Oslo, Sweden

Fig. 1. Map detail of the Viking Age Heimdaljordet site near Gokstad, Vestfold, Norway. The archaeological features are based upon excavation results and interpretations by ZAMG Archeo-Prospections in collaboration with LBI ArchPro and the Gokstad Revitalised Project (MCH, UiO).
Locations of the sample cores for geochemical analysis have been marked

fluorescence (pXRF) for archaeological geochemistry offers an economic, flexible and rapid method for analysing soils, which allows for a reflexive sampling strategy and high sampling volume.

Therefore, after recording, each of the 30 cm long cores were analysed using pXRF at 2 cm intervals. This provided high-resolution geochemical analysis, which was then integrated with micromorphological, environmental, artefact and excavation data where relevant. The result is a better understanding of the potential and limitations of pXRF and geochemistry, and a detailed understanding of the use of space over time in what at first appears to be a highly structured zone within the site.

Applying the geochemical results, in conjunction with the other available data, clearly documents the increasing intensity and expansion of the use of the site over time, giving chronology to prospection data. It is also clear that the plots or parcels of land were used for specialist activities, such as non-ferrous and ferrous metal working, potentially with each plot having a different specialty. The suggestion that possibly contemporary plots were similarly structured, suggests either a degree of site use management or strong cultural and/or practical motives behind the spatial use of the plots. Whilst not all plots have been investigated, the study suggests there is great potential in the method of geophysically informed coring for enhancing geochemical prospection data and understanding better the use of space in past settlements.