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Prospecting the physicochemical past : three dimensional geochemical investigation into the use of space in Viking Age sites in southern Norway using portable XRF By: Cannell, Rebecca J. S. 2017. Summary: This research centres on the use of portable X-Ray fluorescence (XRF) as a tool for archaeological geochemistry. The instrument was used as part of varied contextual, vertical and horizontal sampling strategies on three Viking Age sites in southern Norway in order to investigate archaeological geochemistry as a method of better understanding spatial and temporal variation in occupation deposits. Archaeological deposits are often truncated, redeposited or otherwise disturbed, which limits the application of more established methods for geochemical sampling by means of a static, horizontal grid. Instead, flexible sampling strategies were developed that included coring as a prospection method combined with high-resolution GPR data. The combination of portable XRF and coring, both within excavation contexts and as prospection, allowed high resolution analysis directly onto the core. The minimal sample preparation allowed a greater data volume to be gathered, and the data provided a geochemical chronological sequence for the deposits. Thus, both spatial and temporal planes were accessible where the archaeological material was suitable. The validity of this method, as well as the use of portable XRF for geochemical analysis in archaeology, was assessed critically throughout this research. The results suggest that there is a loss of accuracy and resolution by using portable XRF on unprepared samples; here this is deemed offset by the benefits. The method of coring, and thus preserving the stratigraphy for sampling and analysis, allows not only the continuity and change within the archaeological deposits to

be assessed, but also details soil processes to a greater extent than established, extraction based methods such as ICP-MS. XRF analyses the whole sample, and whilst this can mute certain trends in the anthropological inputs, it means that interpretation can include the impact soil processes have had on these inputs by stratigraphic phase. Moreover, on sites where preservation is limited, deposits that would previously be disregarded for geochemistry can be used to form some understanding of past occupation from the little that remains. This approach is developed though the course of the three case studies, and the data statistically treated using principal component analysis, and interpreted from a geoarchaeological perspective. The research also attempts to embrace theoretical perspectives that enhance insight into past social and cultural practices. As archaeological geochemistry aims to understand space, it is also fundamental to understand the social meaning of space within the contexts investigated. University: Bournemouth University. (AN: 58FBEEA77ACDBEB2)URL: <https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.723404>.

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