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Constructing chronologies in Viking Age Iceland: increasing dating resolution using Bayesian approaches

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Abstract

Precise chronologies underpin all aspects of archaeological interpretation and, in addition to improvements in scientific dating methods themselves, one of the most exciting recent developments has been the use of Bayesian statistical analysis to reinterpret existing information. Such approaches allow the integration of scientific dates, stratigraphy and typological data to provide chronologies with improved precision.

Settlement period sites in Iceland offer excellent opportunities to explore this approach, as many benefit from dated tephra layers and AMS radiocarbon dates. Whilst tephrochronology is widely used and can provide excellent chronological control, this method has limitations; the time span between tephra layers can be large and they are not always present. In order to investigate the improved precision available by integrating the scientific dates with the associated archaeological stratigraphy within a Bayesian framework, this research reanalyses the dating evidence from three recent large scale excavations of key Viking Age and medieval sites in Iceland; Aðalstræti, Hofstaðir and Sveigakot. The approach provides improved chronological precision for the dating of significant events within these sites, allowing a more nuanced understanding of occupation and abandonment. It also demonstrates the potential of incorporating dated typologies into chronological models and the use of models to propose sequences of activities where stratigraphic relationships are missing. Such outcomes have considerable potential in interpreting the archaeology of Iceland and can be applied more widely to sites with similar chronological constraints.

Keywords: Iceland – Viking age – chronology – radiocarbon dating – Bayesian statistics - tephra

1. Introduction

Recent developments in the understanding of scientific dating methods and their use in the construction of archaeological chronologies offer exciting opportunities to reassess and reinterpret the dates obtained from excavations, improving precision and allowing more detailed