THESIS ABSTRACT

Conventional analyses of archaeological residues have not been systematic in their approach to understanding the range of interactions that can define archaeological residues. As a result previous work has tended either to focus on relatively simple compounds or have seriously underestimated the complex of archaeological residues. This study aims to develop a systematic approach to archaeological residue analysis by adapting and applying a taphonomic framework to better understand the complex interactions between residues, ceramics and taphonomy. Organic residue studies are dominated by methods that extrapolate from diagnostic molecular features of modern materials to archaeological remains. These methods can produce spurious without an understanding of the complex interactions involved in the formation of archaeological residues.

Lipids are the most frequently observed archaeological residue component and a principal focus of previous research. My study also focuses on analysis of lipids using a combination of High Performance Liquid Chromatography – Mass Spectrometry (HPLC-MS), Gas Chromatography – Mass Spectrometry (GC-MS) and a suite of data reduction techniques. The systematic taphonomic framework developed in this study allows the identification of the key cultural and post-depositional processes that affect residue formation. I experimentally determine the effects of these processes using controlled simulations on a range of reference fats and oils (RFOs). These RFOs were selected to represent a wide range of common food lipids and structural configurations (i.e. beef, linseed, sesame and fish oils). Experimental simulations include heating, boiling, vessel reuse, alkalinity/acidity, leaching, microbial alteration and the relationship between ceramic fabric and residue.

Each experiment reveals previously unrecognised aspects of residue formation with new molecular mixtures identified that have the potential to confound conventional interpretive methods. While not invalidating these methods the experimental component of the study highlights the need to carefully model the effects of taphonomic processes prior to analysis.

Following the experimental component of this study I examine a series of archaeological ceramic residues. These were extracted from a diverse range of wares and archaeological contexts from Late Bronze and Iron Age sites in Turkey. Samples include perfume containers (*Lydions*) from Sardis and Gordion, storage and transport

pithoi from Troy, putative oil containers (*Red Lustrous wheel-made wares*) from Boğazkoy and cooking wares from Gordion and Boğazkoy.

Lipids recovered from archaeological residues are found to be significantly different to modern products, suggesting that taphonomic processes have played a major role. I identify specific taphonomic processes that are likely to have contributed to these archaeological residues.

The complexity and scale of interactions involved in the taphonomy of archaeological residues pose a significant challenge for analysts dealing with the peculiarities of archaeological sites, individual depositional contexts and artefacts. While providing analytically useful tools for residue identification current identification methods need to be combined with a more systematic conceptualization of archaeological residue taphonomy. A taphonomic framework developed in this enables such an approach and avoids the broad and frequently inaccurate generalisations typical of conventional diagnostic methods.