

Riddles of the Sands: Untangling the Roman Glass Industry

Sally Cottam – The Association for the History of Glass

David Marsh – The Association for the History of Glass

Ian Freestone – University College London

The Romans used more glass than any previous society, introducing glass vessels and windows to parts of the world where these had previously been scarce or absent. The Roman glass industry depended upon a complex, multi-stage production chain, from the sourcing of raw materials through to final vessel creation and decoration. Innovations in scientific compositional analysis, information from recent excavations and assemblage research have transformed our understanding of these connections. Raw and recycled glass as well as finished vessels were often transported over long distances, whilst emerging local production centres reveal a simultaneous de-centralisation of the industry.

The intricacies of glass production are a fruitful resource in understanding the relationships between the various elements of the Roman economy with potential insights relevant to other material groups. This session will feature new and established researchers from the UK and overseas.

Friday 12th (AM)		Room 3 - Nunn Hall
09:30	Introduction	
09:40	“You can have any colour you like, as long as it’s blue/green”. The transformation in the appearance of glass vessels c.40-100 CE (<i>Sally Cottam</i>)	
10:00	Variations in colourant technology of fused mosaic glass from the early Roman period (<i>Liam Richards, Ian Freestone & Lucia Burgio</i>)	
10:20	The (un)swept workshop floor: Making sense of a fragmentary glass chaîne opératoire (<i>Thomas J. Derrick</i>)	
10:40	BREAK	
11:10	Glass trade across centuries: A first archaeometric study of glass from the island of Malta (<i>Matthew Grima, Simone Cagno & Daniel Vella</i>)	
11:30	Rivers of Glass (<i>Victoria Sainsbury</i>)	
11:50	Revealing Roman Britain Through Glass: Insights from an Archaeological Database (<i>David Marsh</i>)	

“You can have any colour you like, as long as it’s blue/green”. The transformation in the appearance of glass vessels c.40-100 CE

Sally Cottam – The Association for the History of Glass

The mid to late 1st century CE has long been identified as a period of considerable development in the production of ancient glass, with profound changes in the appearance of glass vessels across the Roman world. Several commentators have recognized this phenomenon, in particular the significant decline in the production of strongly coloured and polychrome glass and the surge in production of blue/green glass. However, no comprehensive typological and chronological analysis of these trends had previously been undertaken. This paper summarises the results of my doctoral thesis, presenting a more refined chronological sequence for these developments as they occur in the western provinces. I will propose a number of possible explanations as to why glass changes so noticeably during this period. The discussion covers topics such as the impact of an increased demand for glass, changes in taste, the role of glass in vessel manufacture and in construction, and the extended chain of production from the raw glass furnaces of the eastern Mediterranean to the secondary artisans of the western empire.

Variations in colourant technology of fused mosaic glass from the early Roman period

Liam Richards – University College London

Ian Freestone – University College London

Lucia Burgio – Victoria and Albert Museum

Fused mosaic glass in the form of inlays and vessels are a signature of the early Imperial Roman period. They were products of an expanding Roman glass industry using techniques developed from the preceding Hellenistic times. The vessels are found mostly in Italy and the western Roman Empire, whereas the inlays are found in Egypt. This study compares the different techniques, materials, and recipes used to produce the various colours found in these objects. 106 objects from the Victoria and Albert Museum and the Petrie Museum of Egyptian Archaeology have been analysed for 58 major, minor, and trace elements using LA-ICP-MS, and non-invasive Raman Spectroscopy was used to identify opacifiers. Egyptian and Levantine primary glasses were identified on the basis of trace element composition. Opacification was generally due to compounds of antimony and metallic copper but in several cases high concentrations of tin are present. There appear to be different recipes and techniques used to produce the opaque yellow, opaque red, and opaque white glass for the inlays and vessels. The overall results suggest that two different traditions for producing coloured glass were prevalent during this period, one likely based in Egypt, and one in the western Roman Empire.

The (un)swept workshop floor: Making sense of a fragmentary glass *chaîne opératoire*

Thomas J. Derrick – Macquarie University

This paper examines archaeological remains of Roman glassworking activities which might be considered ‘incomplete’ – with significant evidenced gaps in the site’s potential *chaîne opératoire*. Roman glassworking furnaces often leave a much smaller trace than, for example, pottery kilns. In the archaeological record, in many cases furnaces have likely long been dismantled, and they may have been put up temporarily to glaze buildings during major building projects. Accordingly, we frequently find glassworking remains without their furnaces, and even sometimes furnaces without their glassworking remains (depending on degrees of ‘tidiness’). This paper takes two main case studies as its jumping off point: a workshop from Tuscany with furnaces and cullet glass (but no working remains) and a large collection of working waste and some dismantled furnace chunks (with no workshops) from Kosovo. In the grander landscape of excavation publishing, the presence of Roman glassworking on a site is sometimes equated to perceived technological adeptness or the settlement’s cosmopolitan nature but is otherwise not remarked much upon. This paper aims to broaden what we can say about glassworking at Roman sites beyond a

simple presence/absence of the behaviour, into considering inter-site connectivity and their place in the ever-shifting 'glass-scape' of the Mediterranean world.

Glass trade across centuries: A first archaeometric study of glass from the island of Malta

Matthew Grima – L-Università ta' Malta

Simone Cagno – Norges miljø- og biovitenskapelige universitet

Daniel Vella – L-Università ta' Malta

From the earliest settlements to modern day, the Maltese archipelago has benefited greatly from a strong marine trade route that supplied the islanders with the necessities for daily life. Locals have had to rely heavily on Eastern and Western Mediterranean trade routes, as well as their links with Sicily and the north of Africa, directly impacting society and its standing. Glass, which developed from commodity to utility, is thought to have been traded into Malta, as no glass manufacturing furnace has ever been discovered on the island. In this study, a segment of the local Phoenician, Punic and Roman glass population was examined to establish information on their trade origin. 77 glass items from these periods were selected for analysis. Non-destructive surface analysis was prioritised given the unique nature of the objects. SEM-EDS, SXRF and PIXE-PIGE analyses served to preliminarily group the objects and fragments. Representative glass items were further investigated via LA-ICP-MS to determine origin and site context dating. For the very first time, sites have been dated via material culture analysis. This, together with glass groupings has shown that Malta was not left behind in the glass trade industry, with glass typology development seen across the centuries.

Rivers of Glass

Victoria Sainsbury – University of Oxford

Roman glass is an ideal material to consider, not provenance, but movement, particularly at the edges of the western Empire. The imperial economy is one of unprecedentedly large-scale and long-distance sourcing, but with these massive flows are the smaller brooks, backwashes, and areas of brackish water. There is much value in understanding which 'river systems' flows of material belong, where great waters meet, and where don't. Glass can elucidate such connections through its trade and chemistry due to its sole dependence on long-distance trade and its almost endlessly recyclability. Comparing the patterns in glass typology and chemistry across five centuries in Britain, connections and disconnections are illuminated. This paper presents two cases-studies: York and its environs, and a 'southwestern pattern'. In Yorkshire, site-character accounts for most variation we see, but there are several notable exceptions. Then, farmsteads and small towns across West Oxford, Gloucestershire and Wiltshire show an exclusive pattern from the rest of the South which lasts for several centuries. Considering the Severn and character of Hispanic glass shows that, like the Mediterranean Sea itself, water is not barrier but conduit: for people, ideas, and the materials that created and sustained the Roman economy.

Revealing Roman Britain Through Glass: Insights from an Archaeological Database

David Marsh – The Association for the History of Glass

The presentation is based on the analysis of a comprehensive database of Roman dated glass finds collected from selected excavation sites across Britain. The research compares site glass profiles defined by patterns of glass associated with types of sites, including cities, rural settlements, industrial centres, and military bases. The findings from the characteristics of glass types provide insights into the material cultures and socio-economic dynamics of

Roman settlements. The research reveals the correlation between the diversity of glass types and the economic significance of a site. Large cities and military fortresses exhibited wide-ranging glass types and forms emphasising their pivotal roles to the Romano-British economy. The analysis reveals differences in the composition of sites' glass types, reflecting distinct material cultures. The proximity of industrial settlements and rural farming sites to large cities highlights the influence of regional trade networks. These findings enhance our understanding of the diversity and interconnectedness of Roman communities in Britain with fresh insights presented of the trade and transport routes within Roman Britain. The distribution patterns of glass across the region provide a unique lens through which we can explore the dynamics of commerce and cultures during this remarkable period in history.

