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From the Mediterranean to the Libyan Sahara. Chemical analyses of Garamantian glass

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ABSTRACT

This paper presents the results of electron microprobe analysis of 124 samples of glass from sites in Libya, most from the Saharan oasis belt of the Wadi al-Ajal. Imported Roman vessel glass; beads; vitreous production waste; and Islamic glass bangles have all been analysed, and provide the first chemical information on glass from this region.

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1. Introduction and Background

The central Saharan region of Fazzan (see Fig. 1) is of particular significance for debate about patterns of historic Saharan trade because of the recognition of the existence here of an early oasis farming civilisation, known as the Garamantes (Mattingly, 2003; 2013a). There is impressive evidence now available for a significant level of trade with the Mediterranean lands in pre-Islamic times. This work is necessitating a re-evaluation of the connectedness of the Sahara with the Mediterranean and also with Sub-Saharan lands. Compositional analysis of artefacts found at sites in Fazzan, from the final centuries BC to the second millennium AD, has an important part to play in fleshing out our knowledge and understanding of these contacts, as well as potentially illuminating key questions of technological transfer across the Sahara. This paper presents the results of electron microprobe analysis (EPMA) conducted on 124 samples of glass as part of an ongoing programme of chemical analysis also including non-destructive μ XRF, trace element and isotope analyses.

Over 3500 fragments of glass have been recovered from excavations and survey directed by a number of individuals who worked in the area at different times: Mohammed Ayoub, 1961 to 1969; Charles Daniels, 1958 to 1977 (see Mattingly, 2010); and David Mattingly, with the Fazzan Project, 1997–2001 (Mattingly, 2007, 2013a) and Desert Migrations Project, 2007–2011. Glasses were also recovered by the Italian-led excavations of the 1930s (see Pace et al. 1951).

Roman vessel glasses were almost certainly imported directly to Fazzan, but other glasses, including 15 Indo-Pacific beads, may have arrived via a more ‘down-the-line’ model. Cemetery sites have yielded glass beads in contexts dating to as early as the 5th century BC, as well as Hellenistic and Early Roman cast glass vessels. The importation of glass seems to have reached a peak between the 1st and 4th centuries AD, but it continued throughout the first millennium and beyond; shifts in the focus of trade routes coupled with changing burial practices under Islam probably account for the smaller volume of vessels from the later periods, but glass beads and bangles testify to the continued importation and use of glass throughout the second millennium.

Most chemical analyses of North and West African glasses have focused on Islamic material, as the evidence for pre-Islamic glass is incredibly scarce. A major aim has been to determine the provenance of glasses, especially beads (e.g., Brill, 1994; Dussubieux, 2010; Robertshaw et al. 2010, 2014), with a view to reconstructing trade routes. Vessel glass is more rarely encountered, but by the 9th and 10th centuries was certainly heading south along the West African gold trade routes (Insoll, 1996, 63–7; Insoll, 1998; McIntosh, 1995, 247). The extent to which glass was made or recycled in areas linked by, or to trans-Saharan trade routes remains unclear. The currently available evidence does not pre-date the Islamic period and is mainly concentrated in West Africa (e.g., Cissé, 2010, 206–15; Robertshaw et al. 2010; Freestone, 2006; Lankton et al. 2006).

2. Materials and methods

Due to the political situation in Libya, material from the most recent excavations is currently unavailable for analysis. The work reported here was conducted on 124 samples of glass, most brought to the UK

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Fig. 1. Map of Libyan sites mentioned in the text. Imagery © ESRI. (M. Sterry).

by Charles Daniels, and currently stored at the University of Leicester. The details of the sampled material are summarised in Table 1. Jarma was an urban site, the Garamantian capital until the 7th century AD, but also with a post-Garamantian afterlife to the 20th century (Mattingly, 2013a). Most of the glass found at this site is Roman or Late Roman in date, though there are some later Islamic bangles. Qasr bin Dughba is a large fortified Garamantian site, mainly Late Roman in date (Mattingly, 2007). The Royal Cemetery, close to Jarma, is the probable burial ground of Late Garamantian (AD 400–700) rulers, whereas Saniat bin Huwaydi is primarily a Classic Garamantian (AD 1–400) cemetery of less high status, but still featuring numerous glass imports (Mattingly, 2010). Saniat Jibril was a secondary Garamantian centre, essentially a village, close to and contemporary with Jarma. It had a significant productive component and one explanation for extensive finds of

Table 1

Garamantian sites from which material was obtained for sampling. Two bangles were excluded as their find spot is unknown. Two samples of vessel glass from Sabratha, and twelve from Ghirza were also analysed.

Site	Vessels	Beads	Bangles	Production remains
al-Fjayj cemetery	1			
Jarma urban settlement		4	13	10
Qasr Bin Dughba urban settlement	7			
Royal Cemetery	5			
Saniat bin Huwaydi cemetery	13		3	
Saniat Jibril settlement/productive quarter	13		9	
Tinda escarpment settlement	3			
Zinkekra cemetery and settlement	8	3	3	
Zuwila cemetery	1	12		

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