

Neolithic Spaces

Sue Hamilton & Ruth Whitehouse

Volume 1

Social and Sensory Landscapes of the First Farmers of Italy

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The Obsidian Finds

Provenancing, previous work and interpretation

Keri A. Brown & Robert H. Tykot

INTRODUCTION

During the course of the Mass Survey carried out in this project, a number of pieces of obsidian were collected from the surface of several Neolithic sites (Table 6A2.1). These were analysed using a portable X-ray fluorescence spectrometer (pXRF) which measures trace elements present in the obsidian. Past research has shown that trace elements are characteristic for the four different sources of obsidian known to occur on islands in the Western Mediterranean region – Sardinia, Lipari, Palmarola and Pantelleria – and even sub-sources of obsidian on these islands. Knowing the source enables archaeologists to gain insights into trade and exchange networks in the Neolithic. In this short article we present the results of pXRF analysis as well as compiling the previous data on obsidian from the Neolithic sites of the Tavoliere (see also Brown *et al.* 2018).¹

PXRF ANALYSIS AND OTHER METHODS: A BRIEF OUTLINE

Since the 1960s, many different methods of elemental analysis have been used successfully for obsidian sourcing in the Mediterranean. Instrumental neutron activation analysis (NAA), ICP-MS (inductively coupled plasma mass spectroscopy) and several types of X-ray analysis continue to be used, including scanning electron microscopy (SEM) which is limited to major/minor elements. The homogeneity of obsidian and the relatively modest number of sources in continental Europe and the Mediterranean islands have allowed these methods to distinguish between sources, while measuring trace elements distinguishes the sub-sources for each (Barca *et al.* 2007; Bellot-Gurlet *et al.* 2005; Bourdonnec *et al.* 2005; De Francesco *et al.* 2008; Poupeau *et al.* 2009; Tykot 1997; 2002; 2017a; 2019).

From 2007, a portable XRF has also been used on central Mediterranean obsidian. Its advantage in being able to perform non-destructive analyses has resulted in this type of instrument becoming widely used in recent years, with successful studies done in several parts of the world (Cecil *et al.* 2007; Craig *et al.* 2007; Nazaroﬀ *et al.* 2010; Phillips & Speakman 2009). In this study, the obsidian artefacts were analysed using a Bruker Tracer

III-V portable XRF spectrometer. Obsidian is quite homogeneous, so other than having a clean surface, no sample preparation was necessary and the analysis was entirely non-destructive. Within the instrument a special filter of 12 mil Al, 1 mil Ti and 6 mil Cu was used to enhance the precision of measurements for trace elements Rb, Sr, Y, Zr, and Nb, which are widely used to identify source groups for obsidian and other materials. The area analysed for each sample was about 3 x 5mm in diameter, with settings of 180 seconds, 40 kV and 10 μ A current. The exact same instrument and calibration software has been used on geological samples from all of the obsidian sources in the central Mediterranean, Aegean, and Central Europe, clearly distinguishing them, and assigning many obsidian artefacts to specific sub-sources (Freund & Tykot 2011; Tykot 1997; 2002; 2010; 2011; 2017a; 2017b; 2019; Tykot *et al.* 2006; Tykot *et al.* 2011). Test studies have also been done on standards and shared pieces of obsidian to allow comparison of these results with those from other analytical methods, and these data have been incorporated into calibration software. Repeated analyses show precision of 2% or less RSD (relative standard difference) and accuracy within one sigma relative to the RGM-1 and NIST SRM-278 international obsidian standards (Speakman 2012).

The advantages of using pXRF include being able to analyse large numbers of artefacts quickly, whereas other, laboratory-based, methods are more time-consuming due to the need for instrument calibration and sample preparation.

RESULTS (TABLES 6A2.1 AND 6A2.2)

Out of 174 sites visited in the Tavoliere, 21 sites produced obsidian for analysis. A further 2 sites, situated on the edge of the Gargano, Inferno East and Inferno West, are also of possible Neolithic date (Table A62.1). A total of 60 obsidian artefacts was tested, with 54 assigned to the Lipari-Gabellotto source, and just 6 to Palmarola. An additional 4 artefacts turned out not to be obsidian but were identified as high quality black flint, as shown by high Si readings. It is to be noted that this obsidian look-alike lithic was found at Neolithic sites in the northern half of the plain (J40d, J193a, J193c and J224b). One possible source for this flint might be river pebble flint, but these pieces seem to be of good quality flint. Tabular flint was mined in the Gargano in the Neolithic and is usually greyish-brown or honey brown in colour. However black tabular flint occurs near Pugnochiuso on the eastern coastline of the Gargano and this may be a possible source. It is understandable that inexperienced students would collect this in error for obsidian – however even experienced experts on obsidian also have sometimes collected black flint.

Two other pieces of non-obsidian come from J168 and J72a; these have low Si readings and may not in fact be flint at all. This material has not been identified.

DISCUSSION

The new obsidian finds make a significant contribution to our knowledge of obsidian distribution in the Neolithic of the Tavoliere and this set of analytical data, together with previously published data, forms the largest body of information on obsidian provenance for a region of southern Italy.² Table 6A2.2 shows the previously published data, and a grand total of 34 Neolithic sites (including the cult cave site of Grotta Scaloria) have now produced obsidian artefacts (N.B. Some sites appear in both tables but are counted once; J168 did not produce any obsidian). Approximately one-sixth of the obsidian for which the source is known came from Palmarola, an island source off the western coast of Italy. The vast majority of the obsidian came from Lipari, off the northern coast of Sicily and the Gabellotto sub-source in particular. Much of the obsidian in the previous publications (Table 6A2.2) is unprovenanced, unfortunately. At Masseria Candelaro where a total of 92 pieces were found, only 31 were sourced, and 25 came from Lipari while 6 came from Palmarola (Acquafredda & Muntoni 2004), a quarter of the total analysed. Palmarola obsidian seems

SITE NAME	Cat. No.	Site Class	Lipari	Palmarola	Comments
Cava Petrilli	J4	I	4	1	
Masseria Palmori	J20	IV	2	0	
Masseria San Marcello	J40	I	3	1	+1 black flint
Santa Caterina-Tortorella	J42	III	2	0	
Santa Cecilia	J49	I	2	0	
Posta Torrebianca	J56	I	1	0	
Masseria Bongo	J71	III	0	1	obsidian core
Masseria La Quercia	J72	II	6	0	1 unknown
Masseria La Lamia	J73	?	12	0	
Tressanti	J160	I	1	0	
Masseria Santini II	J168	I	0	0	1 unknown
Castiglione III	J172	III	2	0	
Stazione di Amendola I	J184	I	1	0	
Masseria Santa Tecchia	J190	I	1	0	
Posta D'Inanzi	J193	II	2	0	+2 black flint
Monte Aquilone	J207	I	5	0	
Motta Del Lupo	J216	III-IV	2	0	
Masseria San Giusta	J218	I	0	1	
Masseria Scoppa	J224	I	1	0	+1 black flint
Madonna del Oliveto	J235	III-IV	1	1	
Fornovecchio	A207	I	2	1	
Inferno East			1	0	Gargano
Inferno West			4	0	Gargano

Table 6A2.1 New obsidian surface finds in the Tavoliere and their associated sources

to have a more northerly distribution in the Tavoliere, being found at sites located north of the Cervaro river. Only one site in the southern half of the Tavoliere has produced a piece of Palmarola obsidian and that is the large site of Masseria Bongo (J71), a Class III site in Jones' typology (Fig. 6.A2.1). This apparent bias in distribution could well change in the future with more provenanced obsidian finds from the southern half of the Tavoliere. Compared to the northern half, less archaeological fieldwork seems to have been carried out in this part of the plain. No obsidian from Palmarola has been found south of the Ofanto river, the southern boundary of the Tavoliere.

Early work on obsidian seemed to show that this lithic material occurred rarely at Tavoliere Neolithic sites, with only one or a few pieces being found. However, these were mainly surface, unstratified finds. Where sites have been subject to large-scale excavation, such as Passo di Corvo (Mello 1983) and Masseria Candelaro (Cassano & Manfredini, 2004), obsidian finds have been more plentiful. At Masseria Candelaro some obsidian pieces were recovered from the surface but most were from the excavation of ditches and sub-surface features. The difference between excavation and surface collection must be borne in mind when considering obsidian frequency. It is probable that all Neolithic sites had access to obsidian – possibly the larger (Jones' Class III and IV) sites had greater access than the smaller (Jones' Class I and II) sites, so reflecting a settlement hierarchy based on size. Maybe the amount of obsidian reflects settlement population numbers in some way if they can be considered as personal possessions. As Robb (2007: 204) puts it “We have to imagine a constant sparingly-used, low-level trickle of obsidian sleeting horizontally through Neolithic societies, rather than curated heirlooms descending through time”. The vast majority of obsidian found at Tavoliere sites consists of small bladelets and flakes. The only obsidian cores found on the Tavoliere both come from major (Class III) sites. A core

SITE NAME	Cat. No.	Class	Li	Pal	Reference	Comments
La Panetteria (Lucera, Foggia)	J1	II	1	0	Hallam <i>et al.</i> 1976	NAA and OES
Il Casone (San Severo, Foggia)	J221	?	0	2	HHallam <i>et al.</i> 1976	NAA and OES unstratified
Lucera Castle (Foggia)	J10	?	2	1	Hallam <i>et al.</i> 1976	NAA and OES unstratified
Passo di Corvo (Foggia)	J198	IV	10	2*	Mello 1983	Mossbauer spectroscopy and EPR *= probably
Monte Aquilone (Manfredonia, Foggia)	J207	I	3	0	Arias-Radi <i>et al.</i> 1972	Fission-track
Grotta Scaloria (Manfredonia, Foggia)			1	0	Mello 1983	Cult Cave; Mossbauer spectroscopy and EPR
Masseria Candelaro	J204	II	25	6	Acquafredda & Muntoni 2004	EDS, SEM and BSD analysed 31 of 92 pieces
Masseria Capo di Lupo					Cassano & Manfredini 1983	3 unprovenanced unstratified
Masseria Mischitelli					Cassano & Manfredini 1983	3 unprovenanced unstratified
Masseria San Chirico					Cassano & Manfredini 1983	1 unprovenanced unstratified
Posta D'Innanzi	J193	II			Cassano & Manfredini 1983	4 unprovenanced unstratified
Masseria Santa Tecchia	J190	I			Cassano & Manfredini 1983	4 unprovenanced unstratified; 1 unprovenanced taglio 5
Masseria Belvedere II	J188	I			Cassano & Manfredini 1983	1 unprovenanced unstratified
Masseria Centonze (=Stazione di Amendola I)	J184	I			Cassano & Manfredini 1983	1 unprovenanced unstratified
Masseria Pedone					Cassano & Manfredini 1983	1 unprovenanced unstratified

Table 6A2.2 Previous obsidian finds in the Tavoliere



Fig. 6A2.1 Obsidian core from the Palmarola source from Masseria Bongo (J71)

of Lipari obsidian was found as a surface piece at Masseria Candelaro (Acquafredda & Muntoni, 2004), while a core of Palmarola obsidian was similarly a surface find at Masseria Bongo (Fig.6A2.1). The latter core seems to have had only a few bladelets struck from it before being abandoned. This may be due to a fault in the core, a large phenocryst running down its length, which may have only become apparent after the removal of the outer bladelets. Obsidian cores are extremely rare finds in the Apulian Neolithic in general because they can be worked until no more bladelets can be struck, then smashed to produce flakes (see Robb 2007: 192–204). Obsidian finds also depend on the recent ploughing of the site – for example Masseria La Quercia (J72) had been visited several times during the Tavoliere-Gargano Project, but it was only on the final visit, when a transect survey was carried out, that 7 obsidian pieces were found (see this chapter, Appendix 3).

Exactly what obsidian was used for in the Neolithic is still an unanswered question; we can however look at the few facts we have. In his book Robb (2007: 192–204) discusses the possible role(s) that obsidian may have played in Neolithic society. He notes the sharpness of freshly flaked obsidian and that its best use was in cutting soft materials, like a knife. When we look at the frequency of occurrence of obsidian at Neolithic sites in the Tavoliere, the excavated site of Masseria Candelaro has produced the greatest number of obsidian pieces and only a small percentage of the total site was excavated in fact. We can assume that the true numbers of obsidian artefacts in the Tavoliere Neolithic were much higher than that suggested by surface finds. We can also see that all classes of site had access or could acquire this lithic from Tables 1 and 2. Tykot (2011) points out that if obsidian represents a very low percentage of the total lithic assemblage of a site then it is unlikely to be an important component of daily life. However it could be an important component of other aspects of Neolithic life. Obsidian from the Tavoliere seems to have few signs of use-wear compared to flint. This would suggest that obsidian was not used in daily activities but on a few occasions only, before being discarded. Obsidian is an exotic lithic, but does not seem to have been treated as such by the Neolithic people of the Tavoliere – it was not curated, not placed with human burials, and not placed in other ritual contexts. It is found in ditches and on the surfaces of settlement sites, as though after its limited use it was then discarded. However the numbers of obsidian pieces that could be present at these sites (if Masseria Candelaro is a guide) implies that a steady supply of obsidian was needed. This fact may mean that instead of a simple down-the line model of obsidian movement there may have been a more organised supply route from the sources to the Tavoliere.

So what could obsidian be used for? We suggest that special rituals involving *rites de passage*, such as the cutting of the umbilical cord of newborns and/or the circumcision of boys would require the extremely sharp edge of a freshly knapped obsidian blade or flake. These rituals would occur continually in Neolithic communities of all sizes and necessitate the need for a steady supply of obsidian. There is plenty of ethnographic evidence for obsidian being used this way in communities that have access to obsidian.

Our analysis of the Tavoliere obsidian suggests that although an exotic lithic, everybody in the Neolithic who wanted obsidian had access to it. It may have been exotica but was not treated as such. Present day archaeologists perceive that obsidian is special, the ‘black gold’ of the Neolithic, when maybe this is not how Neolithic people saw it. Our modern perceptions of obsidian may have coloured previous interpretations of this lithic and its role in Neolithic society.

NOTES

- 1 This report was written before the publication of Brown *et al.* 2018. This and other recent references have been added to the report and included in the Bibliography.
- 2 Acquafredda *et al.* 2017 includes analyses from a larger number of sites in Apulia.

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