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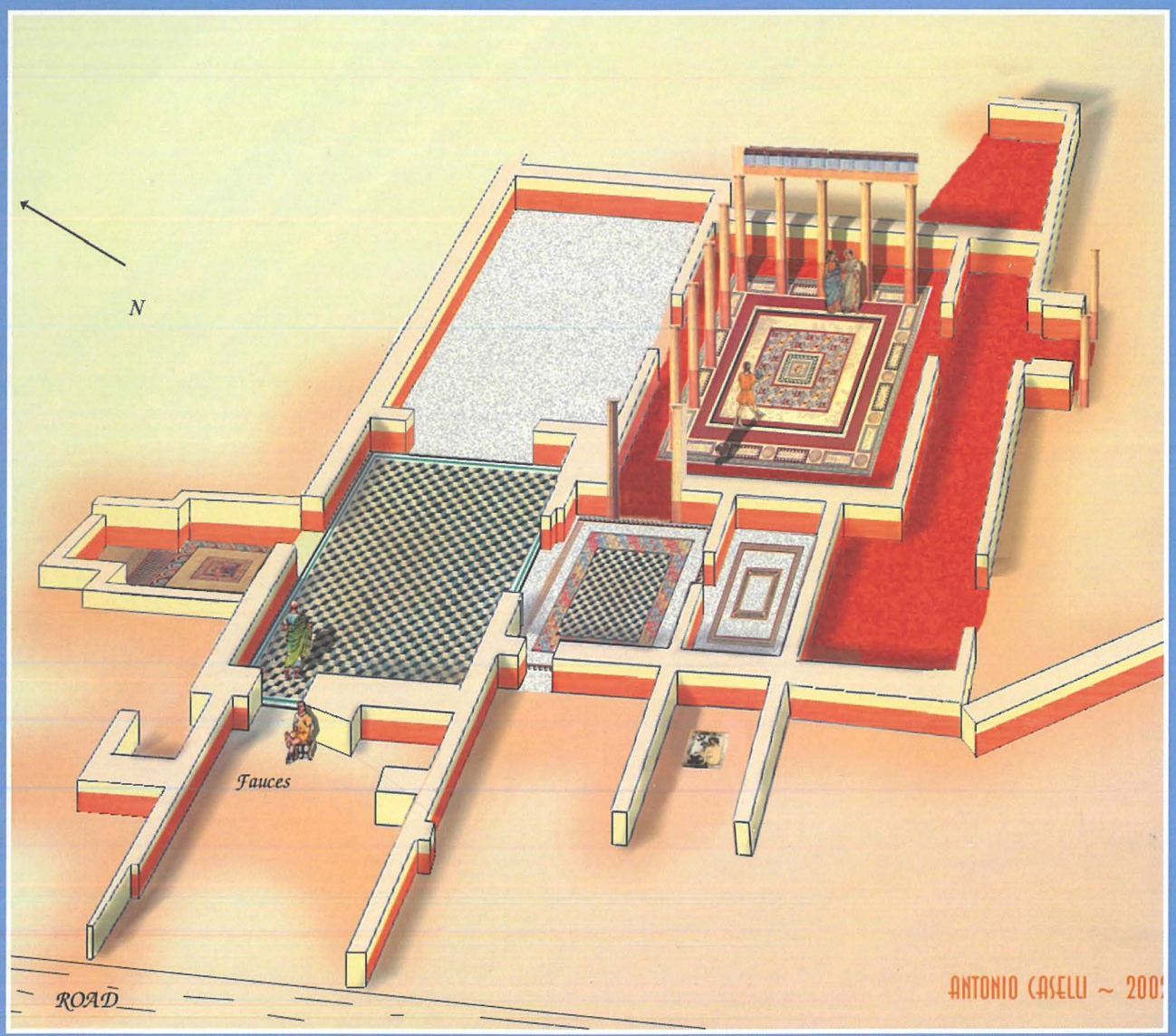
Malta Archaeological Review



THE JOURNAL OF THE ARCHAEOLOGICAL SOCIETY, MALTA

ISSUE 9, 2008–2009

THE ARCHAEOLOGICAL SOCIETY

The Malta Archaeological Society was founded in 1993 and is a registered Voluntary Organisation (V/O 195). It is formed of members with a genuine interest in archaeology in general and that of the Maltese Islands in particular. Anyone with such an interest, whether a professional archaeologist or not, is welcome to join. The Society is concerned with all matters pertaining to archaeology. One of its principal objectives is to promote and enhance the study of archaeology at all levels. It is not a pressure group. It believes that it is only when there is a sufficient interest in, and understanding of, our archaeological heritage among the public at large, that this priceless heritage can be protected and preserved.

The Society organizes meetings and seminars, which are open to the public, as well as site visits both in the Maltese Islands and abroad. It publishes the *Malta Archaeological Review*, an annual peer-reviewed journal devoted to articles, reports, notes and reviews relating to current research on the archaeology of the Maltese Islands. The Society endeavours to maintain close relations with Heritage Malta, with the Superintendence of Cultural Heritage, and also the Department of Classics and Archaeology of the University of Malta and to support their activities.

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MALTA ARCHAEOLOGICAL REVIEW

Issue 9, 2008–2009

FROM THE PRESIDENT

As one cannot in all fairness expect another issue of the *Malta Archaeological Review* to make it in time for the press within the next seven months, I consider this to be the last edition that I shall be addressing before the end of my second and final term of office as president of the Archaeological Society in January 2014. Nevertheless, to see another issue ready for publication just over a year after the previous one is a source of satisfaction and delight. For the purpose of writing this address I have had the privilege of reading the contents of this number before it went to press, and I thoroughly enjoyed the experience. I am sure that you will agree with me that with the introduction of peer reviewing the quality and the scholarly level of the contributions have continued to improve. Some cosmetic changes have also enhanced the appearance of the journal.

The Society Activities section shows, once again, how active the society has been in terms of both lectures and site visits.

The main articles range in scope from prehistoric archaeology to Roman, with a predominance of the latter – as many as four out of seven. The journal has also ventured, I believe for the first time, into meteorological issues of conservation and into experimental archaeology.

The limited available space does not allow me to do justice to all the articles, but I cannot help making a special mention of three in which I was, to a greater or lesser extent, personally involved as tutor in the student years of their contributors. Antonio Caselli's contribution satisfies my longing to see his undergraduate dissertation on the Roman domus mosaics develop and mature into a peer-reviewed article. David Cardona rewards us with the fruits of a small, but significant, section of the vast number of architectural decorative pieces he studied for his Master of Arts degree.

With Timmy Gambin now firmly installed as full-time senior lecturer in maritime archaeology at the University of Malta it is natural to expect that underwater archaeology will become increasingly more visible in the context of the Maltese islands. The article on ancient anchors by him and two former students of mine, one of whom also wrote her MA dissertation under my direction, is a timely account and gazetteer of a generously represented category of this field of research.

The newly introduced feature, Notes & News, to allow space for short contributions and updates, has proved to be a bright idea, and I am sure it will be availed of increasingly in the future. I am told by the editor that he would dearly welcome reports on archaeological discoveries and interventions taking place within specific periods. The *Malta Archaeological Review* has in the past carried such reports and it would be ideal to revive the feature.

Finally, the Reviews section reflects the exponential increase in the interest in Maltese archaeology and the blossoming of literature on the subject by both Maltese and foreign writers.

Hearty congratulations to the editor and his editorial team for this great achievement, both in terms of scholarly output and for the greatly reduced time of gestation. At this rate, they have raised our hopes of catching up with the timely publication of the journal within its calendar year – not an easy feat.

Anthony Bonanno
June 2013

SOCIETY ACTIVITIES

2008

16 January
Prof. George E. Camilleri (University of Malta)
Lecture: *Teeth in Archaeology*

26 January
Dr Anton Bugeja (independent researcher)
Site visit: *Mosta area of Tal-Wej and environs (cart ruts, dolmen, tombs, cave)*

20 February
Dr Nicholas Vella (University of Malta) and Mr Nathaniel Cutajar (Superintendence of Cultural Heritage)
Lecture: *The Mġarr ix-Xini regional park project and excavations at Għar ix-Xiħ, Gozo*

1 March
Dr Nicholas C. Vella (University of Malta)
Site visit: *Borġ in-Nadur and Ta' Kaċċatura, Birżebbuġa*

12 March
Ms Bernadette Mercieca (independent researcher)
Lecture: *Funerary ritual in the Tarxien Cemetery Period*

29 March
Site visit led by Dr Stephen Spiteri (Restoration Unit)
Site visit: *Ta' Kassisu and Armier coastal entrenchments*

16 April
Mr Mario Vassallo (independent researcher)
Lecture: *The location of the Maltese Neolithic Temples*

21 April
Prof. John Oakley (The Andrew W. Mellon Professor of Classical Studies at the American School of Classical Studies, Athens)
Lecture: *Children in Athenian Funerary Art during the Peloponnesian War*

26 April
Dr Nicholas Vella (University of Malta)
Site visit: *Day trip to Gozo*

21 May
Mr David Cardona (Heritage Malta)
Lecture: *The Roman architectural decoration of the Maltese Islands*

31 May
Dr Timmy Gambin (Aurora Trust)
Site visit: *Harbour work entitled 'On the trail of Maltese Merchants'*

25 October
Dr Giulia Recchia (Missione Archeologica Italiana)
Site visit: *Tas-Silġ (northern enclosure)*

29 October
Dr Timmy Gambin (Aurora Trust) and Mr Keith Buhagiar (independent researcher)
Site visit: *Exploring the ancient cisterns of Malta and Gozo*

19 November
Prof. Paul Arthur (University of Lecce)
Lecture: *Byzantine and Turkish Hierapolis*

29 November
Dr Stephen Spiteri (Restoration Unit) and Mr Denis A. Darmanin (independent researcher)
Site visit: *The gardens within the fortifications in the Floriana area*

10 December
Ms Amelia Brown (independent researcher)
Lecture: *Great maritime goddesses of the ancient Mediterranean*

2009

21 January
Prof. Anthony F. Harding (University of Exeter)
Lecture: *War in the Bronze Age*

31 January
Dr Anton Bugeja (independent researcher) and Mr Paul C. Saliba (Restoration Unit)
Site visit: *Old Parish church of Siġġiewi followed by a walk in the area of Ġebel Ciantar and il-Wardija ta' San Ġorġ*

18 February
Prof. Anthony Bonanno, Nicholas Vella (University of Malta), Prof. Roald Docter (University of Ghent), Mr Anthony Pace and Mr Nathaniel Cutajar (Superintendence of Cultural Heritage)
Lecture: *The Malta Survey Project 2008: scope and preliminary results of a joint Belgian-Maltese fieldwalking survey in northern Malta*

28 February
Fra John Critien (resident knight at Fort St Angelo)
Site visit: *Fort St Angelo, Birgu*

28 March
The production of olive oil in ancient times (seminar)

Prof. Anthony Bonanno and Nicholas Vella (University of Malta),
Olive pressing at Żejtun: preliminary results of the University of Malta excavations at the Roman villa site in Żejtun (2006-2009)

Dr Davide Locatelli (Arcaema Srl)
Malta's green gold? Assessing the capability of the torcularium (wine press) in San Pawl Milqi
Dr Timmy Gambin (Aurora Trust) *An overview of olive oil production on ancient Malta*

15 April
Ms Isabelle Vella Gregory (University of Cambridge)
Lecture: *The bronze warrior and the focaccia: Tales of entanglement from Nuragic Sardinia*

25 April
Site visit: *Day trip to Gozo*

28 May
Ms Rebecca Farrugia (independent researcher)
Lecture: *Early Metallurgy in the Maltese Islands.*

30 May
Mr Keith Buhagiar (independent researcher)
Site visit: *Għerien il-Lhud, Binġemma*

17 October
Prof. Alex Torpiano (University of Malta)
Site visit: *Fort Manoel, Manoel Island, Gzira*

21 October
Dr Timmy Gambin (Aurora Trust)
Lecture: *Underwater exploration off the island of Ventotene, Italy – the discovery of ancient shipwrecks and cargoes.*

4 November
Dr Claudia Sagona (University of Melbourne)
Lecture: *Looking for Mithra in Malta*

25 November
Ms Hanna Stöger and Dr Hans Kamermans (University of Leiden)
Lecture: Ostia the Port City of Rome: Society and Urban Infrastructure during the 2nd century AD

12 December
Dr Reuben Grima (Heritage Malta)
Site visit:*The protective tent structures at Ħaġar Qim and Mnajdra*

Site visit to the cart ruts at T'Alla w Ommu, San Pawl tat-Tarġa, 26 January 2008 (photograph by Antcn Bugeja)

'Prehistoric painted pottery in Malta': a century later

Davide Tanasi

In 1911 T.E. Peet pointed out for the first time the difficulty of interpreting the earliest examples of Maltese prehistoric painted pottery. After a century of excavations and research this issue is still largely open especially with regard to Bronze Age wares. This paper deals with the Bronze Age painted pottery class named 'dribbled ware', characterized by decoration produced with the partial application of a thick slip instead of paint. This ware has been reported from several sites in the Maltese archipelago. Focusing on the evidence from In-Nuffara in Gozo, a new hypothesis about the chronology and function of the dribbled ware will be presented.

Just over a hundred years ago, T.E. Peet (1911) published an article entitled 'Prehistoric painted pottery in Malta'. Focusing on 50 painted prehistoric sherds, he presented their different features. Peet was not able to define the chronology of the sherds and remarked about what for him was the main problem in dealing with painted pottery: 'The trouble hitherto has been that everything found in Malta seemed to belong to one and the same date.' (Peet 1911, 123).

After a century of investigations, the general outline of Maltese prehistory is obviously clearer. However general issues are still open especially for the Bronze Age (Fig. 1), knowledge of which is penalized by the missed reappraisal of some old archaeological contexts and the lack of publication of recent excavations.

Among the material published by Peet, which included pottery ranging from the Neolithic to the Middle Ages, was one painted fragment found during the excavations he had carried out at Baħrija (Peet 1910, 159, pl. 15.63) (Fig. 2a), and others from Ħal Saflieni, partly covered by a dull unpolished slip in matt red or brown colour applied in the shape of discs or vertical and horizontal bands (Peet 1911, 122).

A year earlier, similar prehistoric pottery from the hypogeum of Ħal Saflieni was noted by Tagliaferro (1910, 12-13). He described a 'red ware with rope ornament, incised or in relief', a class of which (his class 15) was characterized by 'painted' bowls and cups. Those vessels were decorated with a thick red slip applied like paint on the inner and outer surfaces and simple motifs ranging from bands to circular spots.

During the excavations carried out in 1921-1922 in the temple of Borġ in-Nadur, Murray found

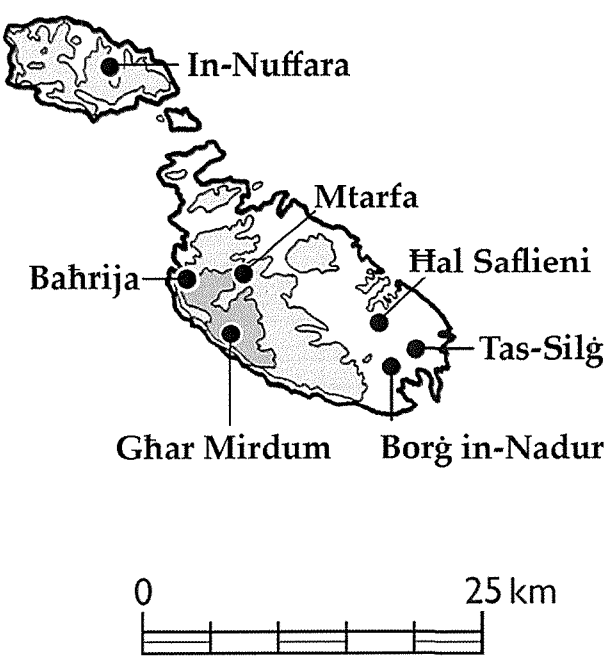

Figure 1. Map of the Maltese archipelago with indication of the principal Bronze Age sites mentioned in the text (drawing by Maxine Anastasi).

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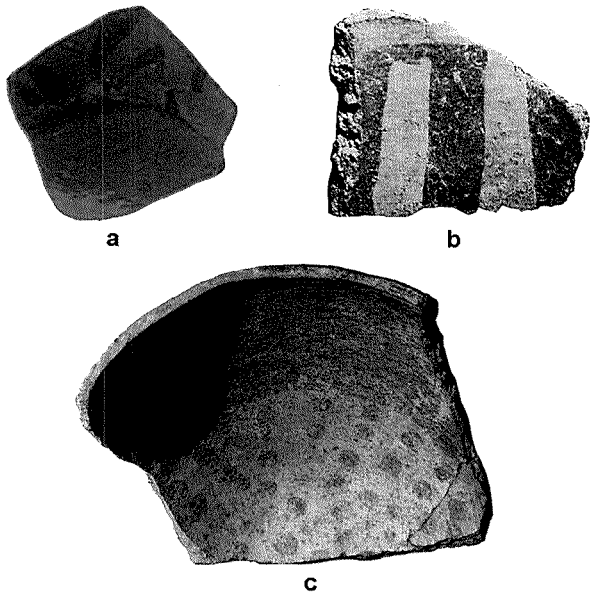

Figure 2. a) Painted sherd from Bahrija (after Peet 1910); b) Dribbled sherd from Borġ in-Nadur (after Murray 1923); c) Dribbled bowl from In-Nuffara (photograph reproduced courtesy of Daniel Cilia).

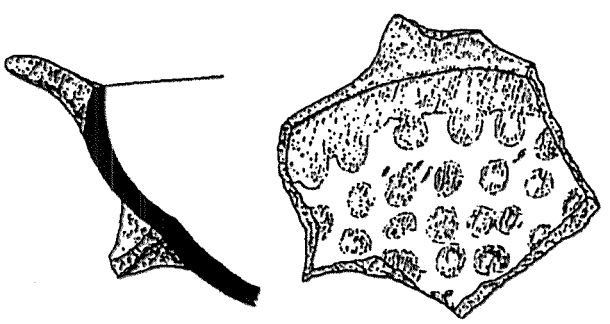

Figure 3. Dribbled bowl from the Apsidal Building of the Borġ in-Nadur temple (Evans 1971, fig. 43.1).

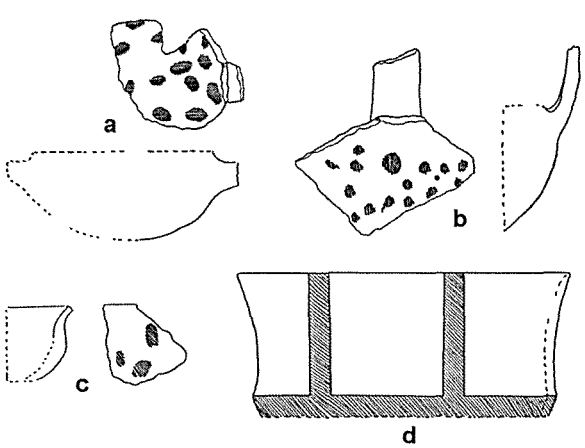

Figure 4. a-d) Dribbled ware sherds H3-H6 from Ħal Saflieni (after Murray 1925, pl. 25).

pottery fragments also decorated with the application of red slip in spots and bands (Murray 1923, pp. 38-39, pl. 20.5-6) (Fig. 2b). One of the two sherds she published was later discussed by Evans (1971, 226, fig. 43.1), who also included a drawing (Fig. 3). In dealing with this uncommon ware, Murray recalled similar pottery from Ħal Saflieni (Murray 1925, p. 35, pl. 25. H3-H6) (Fig. 4).

It was Trump (1961), forty years later, who gave a name to this ware. On the basis of the stratigraphic evidence he observed in the exploration of the Borġ in-Nadur village and at Baħrija carried out in 1959, he identified three classes of fine wares as representative of three chronological phases (II B1, II B2, II B3) spanning seven centuries, from 1500 to 700 BC. Providing for each phase the shapes, the technical features and the decorative techniques, Trump ascribed the painted class with partial application of the slip to the phase II B3 naming it 'dribbled ware' (Trump 1961, 259).

The following year, Trump explored a silo pit on the In-Nuffara plateau, in Gozo (Fig. 5). It had two entrances with internal walls covered by clay renders, partly filled with pottery. In the preliminary report of the excavation, he referred to the discovery of 'dribbled Borġ in-Nadur' pottery, similar to what he had 'noticed at Baħrija' (Trump 1960, 5), of which only one sherd of this type was published many years later (Trump 2002, 272) (Fig. 2c). More recently, examples of dribbled ware have also been found during the excavations of Tas-Silġ at the northern enclosure (*pers. comm.* G. Recchia) and as well as the southern one (*pers. comm.* N. C. Vella).

Between 2007 and 2010, in the context of a research project on the Maltese Bronze Age that grew as a collaboration between Arcadia University (Davide Tanasi), the University of Malta (Nicholas C. Vella) and Heritage Malta (Sharon Sultana), I carried out an overall reappraisal of all the Bronze Age material held at the National Museum of Archaeology in Valletta pertaining to the sites of Borġ in-Nadur temple and village, Baħrija, Għar Mirdum, Mtarfa and In-Nuffara. In the course of that study, I also carried out an in-depth examination of the specimens of dribbled ware. These did not include the dribbled pottery found by Peet and Murray at Baħrija and the Borġ in-Nadur temple. Moreover, none were found among the pottery from Għar Mirdum and Mtarfa. The Ħal Saflieni material was not studied, whilst the study of the pottery from Trump's excavation at the Borġ in-Nadur village and

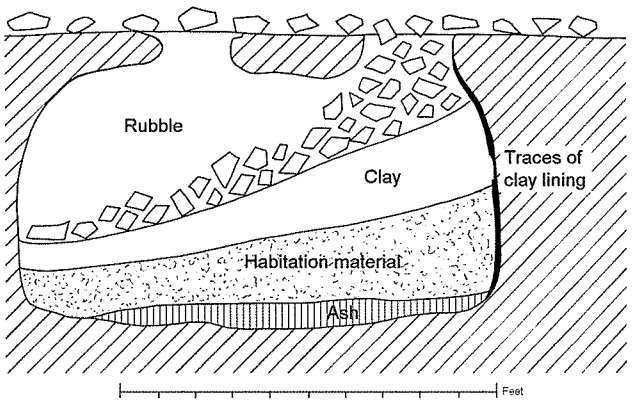

Figure 5. In-Nuffara silo pit (after Trump 1960, graphic elaboration by C. Veca).

Baħrija is still ongoing. Here, I have decided to focus on the significant evidence from In-Nuffara.

Although this context cannot be considered entirely sealed, since a part of the pottery was removed just before Trump's exploration (Trump 1960, 5) it clearly belongs to the Borġ in-Nadur phase, with the exception of a single sherd of Tarxien Cemetery type. It seems clear that at one time the function of the silo pit of In-Nuffara changed from storage space to dumping place for refuse originating in a village, probably located on the top of the plateau. The 2944 ceramic sherds examined include fine and coarse ware, table ware, storage jars and also mud bricks likely used in domestic architecture (Table 1). Materials made from stone were represented by mortars and hones. The application of the method of the minimum number of individuals (MNI) (Protocole Beuvray 1998) to the whole ceramic has given different vessels (MNI). Thirty-four sherds belong to at least 16 different vessels and are examples of dribbled ware.

In order to determine the technical and stylistic characteristics of this pottery class observed at In-Nuffara, it is useful to recall the main features of the Borġ in-Nadur pottery production, of which dribbled ware forms part. In a recent reappraisal of the Borġ in-Nadur phase pottery found at the eponymous temple site (Tanasi 2011a, 89-90), I identified five fabrics, three of which (fabric 1, 2 and 4) are the most common and correspond to Trump's phases of pottery production (II B1, II B2, II B3) (Table 2). The In-Nuffara dribbled ware shows a very hard and non-porous fabric, with very few and tiny calcareous inclusions. The body is usually dark yellow (10 YR 8/3 very pale brown) and the slip goes from dark red (2.5 YR 5/6 red) to very dark brown in colour (2.5 YR 4/1 dark reddish gray). The slip is very thick and solid, it does not crackle or flake off and is never burnished. On the slipped surfaces, which are always polished, it is possible to observe horizontal or slightly oblique pattern traces left by a kind of brush. The sherds are well fired in a uniform way and no signs of temperature alterations or of overburning can be observed. The core shows the same colour of the body. Only one specimen, NNF60/P/2009/18, has a repair hole (Fig. 7a).

It was noticed that the slip is applied with a decorative function following standard rules. Leaving aside the tiny sherds, of the 34 specimens, 17 have a red slip (Fig. 6) and 14 have a black one (Fig. 7). When the black slip occurs, the clay body is well fired, meaning that the darker colour is obtained through a slip with a different composition. The outer walls are generally completely slipped or covered by two or more thick horizontal spaced out bands (Fig. 7p); the inner ones show an irregular series of circular (Figs. 6a-p, 7b-n) or oval spots (Figs. 6j, 7d, 7o) bordered at the top by a

Shape/Part	Number of sherds	Types/Examples/Class
Walls	2140	fine ware: 406; medium ware: 980; coarse ware: 754
Diagnostic rims	242	type I: 74; type II: 9; type III: 50; type IV: 19; type V: 1; type VI: 1; type VII: 25; type VIII: 33; type IX: 2; type X: 2; type XI: 16; type XII: 1; type XIII: 1; undefined: 8
Undiagnostic rims	116	—
Simple bases	93	flat bases: 83; embossed bases: 10;
Footed bases	22	conical feet: 12; bell shaped feet: 10
Handles	126	loop handles: 123; axe handles: 2; strap handle: 1
Storage jars	150	6 vessels
Lids	21	20 vessels
Dribbled ware	34	16 vessels

Table 1. Pottery types from In-Nuffara, Gozo.

Fabric 1 (II B1) *Reddish yellow fabric with thick red slip*	**Fabric 2 (II B2)** *Pink fabric with red mottled slip*	**Fabric 4 (II B3)** *Reddish yellow fabric with dark red to black mottled slip*
Soft powdery fabric, with calcareous inclusions (very fine-fine, 2-5%) and voids (fine-medium, 2-5%); orange body (5 YR 7/6 reddish yellow), gray core (2.5 Y 6/2 light brownish gray); thick crackling slip from red to scarlet (from 10 R 5/8 red to 10 R 6/4 pale red), sometimes applied in two layers, generally burnished. Linear cut out decoration with white inlay.	Hard-very hard fabric, rarely porous, with calcareous inclusions (fine-medium 5%) and voids (fine 5%); pink body (10 Y 7/4 pale red), gray core (2.5 Y 6/2 light brownish gray); mottled crackling slip with several shades of red (from 2.5 YR 4/8 red to 10 R 6/4 pale red) marked by large irregular black blotches, frequently not burnished. Linear cut-out and simple geometric decoration with white inlay.	Hard-very hard fabric, porous, with calcareous inclusions (very fine 2-5%); dark red surface (from 5 YR 7/6 reddish yellow to 2.5 YR 2.5/1 reddish black), grey core (2.5 Y 6/2 light brownish gray); thin slip roughly burnished or not burnished with irregular dark blotches. Linear cut out and simple geometric decoration with white inlay.

Table 2. Borġ in-Nadur pottery fabrics according to Trump (1961) and Tanasi (2011a).

horizontal band (Figs. 6a-f, 7a, 7b) or set into a frame of crossing bands (Figs. 6c, 6e, 6m). One example also shows an additional pattern of smaller spots (Fig. 7m). A kind of motif based on the combination of two or three circular spots can be found on some examples (Figs. 6d, 6n, 7a). Series of horizontal bands are also common (Fig. 6r). On just one sherd there is a partial rough motif, that can be interpreted as an eye (Fig. 6q). In another case, there is a pattern made with knobs of thick slip, which were pierced by a stick before drying (Fig. 6p). In one example, the dribbled decoration is combined with a cut-out line in which small globular pellets are set (Fig. 6s). Apart from this case, all the decorative motifs observed on the pottery from In-Nuffara recall the evidence from other sites.

Almost all the In-Nuffara specimens belong to medium size open vessels, such as bowls or one handled dipper cups with a carinated body and flat base. The material is very fragmentary and only two sherds are well enough preserved to indicate their typology. NNF60/P/2009/1 is a bowl with a shallow carinated body with indistinct everted rim and thinned top (Fig. 8a). The shape recalls the dipper cups of type 3 identified at the Borġ in-Nadur temple, but also evident at Għar Mirdum, Baħrija (Tanasi 2011a, 116-117) and Mtarfa (Sagona 1999, 34, fig. 7.4). Furthermore, it can be compared with sherds H5 and H6 from Ħal Saflieni (Murray 1925, p. 35, pl. 25.H5-H6) (Fig. 3c-d). NNF60/P/2009/2 represents an exception (Fig. 8b). In fact it is the only identified closed vessel, probably the high distinct neck of a jug or an amphora, with indistinct everted rim and rounded top, comparable with the amphorae of type 1C (Tanasi 2011a, 109-111) or the juglets of type 1 (Tanasi 2011a, 111-113) found at Borġ in-Nadur. Finally, the sherd NNF60/P/2009/20 (Fig. 7c), although not well preserved, clearly belongs to a dipper cup comparable with fragments H3 and H4 from Ħal Saflieni (Murray 1925, p. 35, pl. 25 H3-H4) (Fig. 4a-b).

It is hard to find comparisons for this class of pottery outside the Maltese archipelago. However, it is worth pointing out the discovery of some bowls, with the same method of painted decoration, in the sanctuary of Montagna di Polizzello in central Sicily. There a two-handled bowl of Borġ in-Nadur II B3 type has been found inside a circular building dated to the first half of the ninth century BC, on the eastern side of the sanctuary area (Tanasi 2007; Vella *et al.* 2011, 265). In contemporary layers, two bowls decorated with simple motifs obtained by the direct application of a thick slip on the clay body (Fig. 8b-c), a largely uncommon practice in Sicilian prehistoric pottery, were found inside votive pits. Although fabrics and typology do not find a match in Maltese pottery, such a decorative use of slip can only be compared with dribbled ware since no comparisons are known in Sicily.

To establish the chronology of the dribbled ware is a very hard task. This is especially so in view of the debate about the contested chronology of the Maltese Bronze Age (Trump 1961; Evans 1971; Tanasi 2011a *contra* Sagona 2008, 2011) and its links with the Sicilian sequence (Tanasi 2011a *contra* Recchia and Cazzella 2011).

It is however possible to propose some suggestions. The pottery from In-Nuffara, with the exception of one single Tarxien Cemetery phase sherd, seems to belong to Borġ in-Nadur II B1 and II B2, testifying to a long period of use of the pit. The comparisons found for the diagnostic pieces recall shapes of the repertoires identified for the transitional

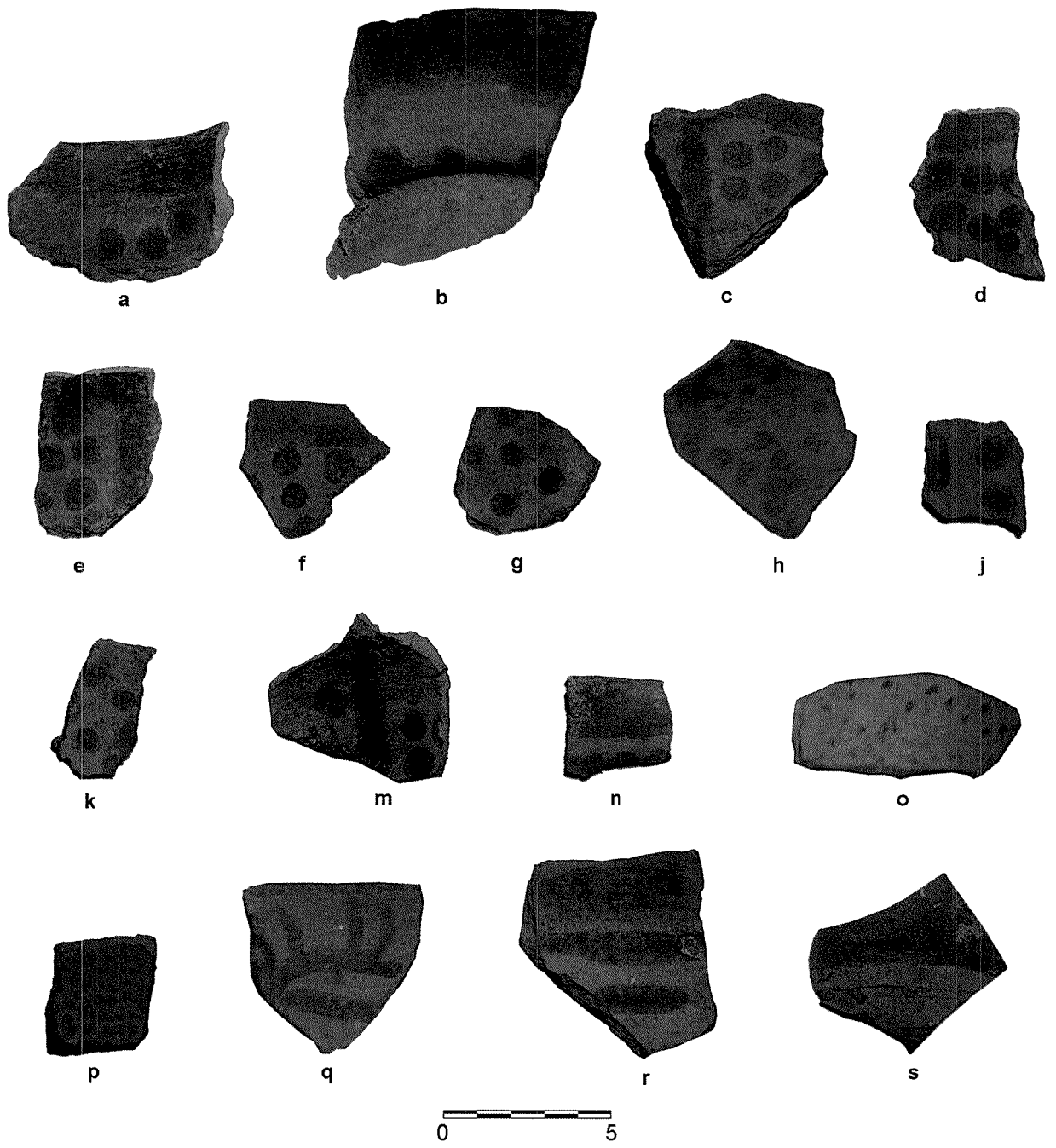

Figure 6. Dribbled ware with red slip: a) NNF60/P/2009/1; b) NNF60/P/2009/2; c) NNF60/P/2009/3; d) NNF60/P/2009/4; e) NNF60/P/2009/5; f) NNF60/P/2009/6; g) NNF60/P/2009/7; h) NNF60/P/2009/8; j) NNF60/P/2009/9; k) NNF60/P/2009/10; m) NNF60/P/2009/11; n) NNF60/P/2009/12; o) NNF60/P/2009/13; p) NNF60/P/2009/13; q) NNF60/P/2009/15; r) NNF60/P/2009/16 s) NNF60/P/2009/17 (photographs by the author).

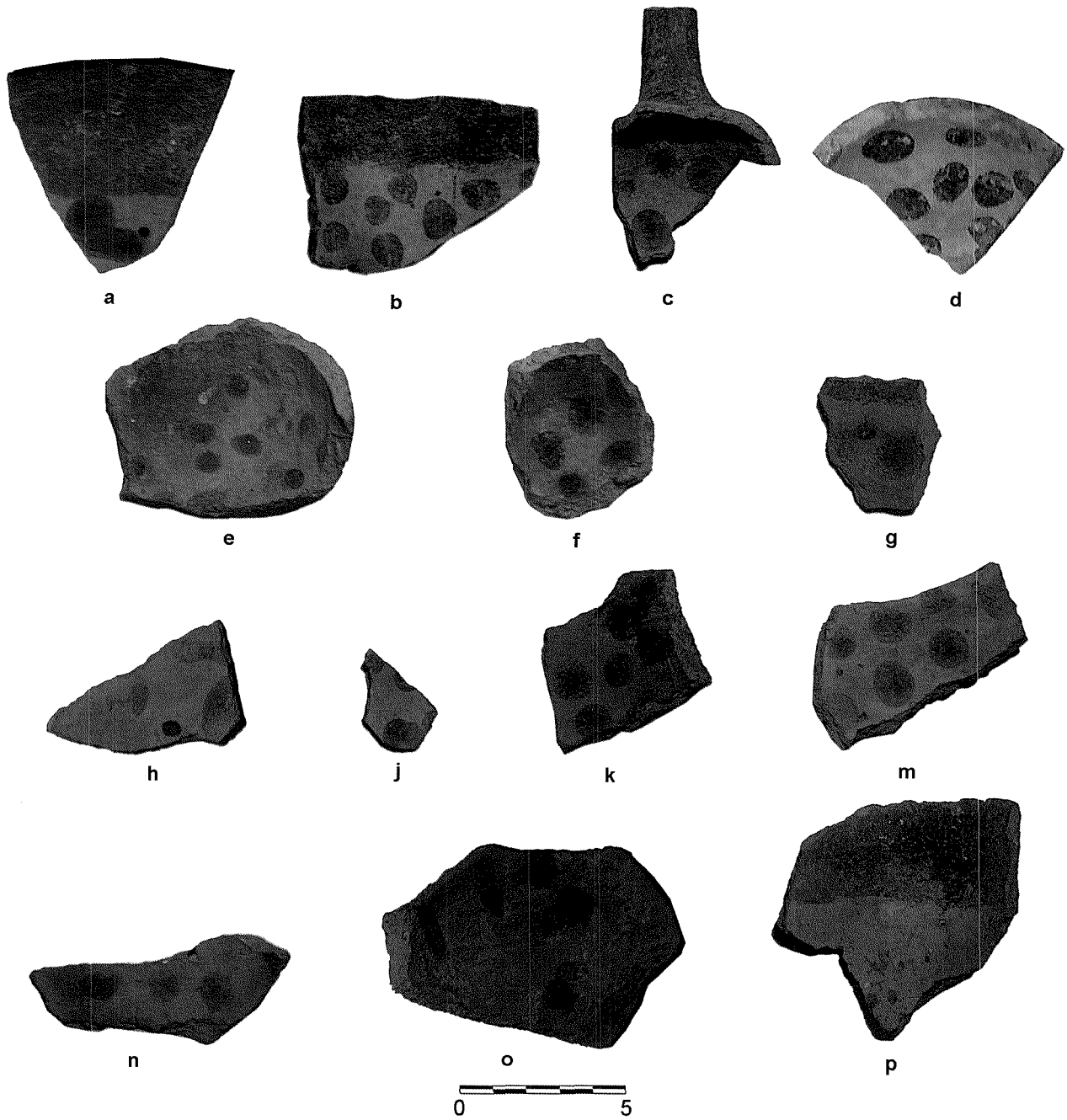

Figure 7. Dribbled ware with black slip: a) NNF60/P/2009/18; b) NNF60/P/2009/19; c) NNF60/P/2009/20; d) NNF60/P/2009/21; e) NNF60/P/2009/22; f) NNF60/P/2009/23; g) NNF60/P/2009/24; h) NNF60/P/2009/25; j) NNF60/P/2009/26; k) NNF60/P/2009/27; m) NNF60/P/2009/28; n) NNF60/P/2009/29; o) NNF60/P/2009/30; p) NNF60/P/2009/31 (photographs by the author).

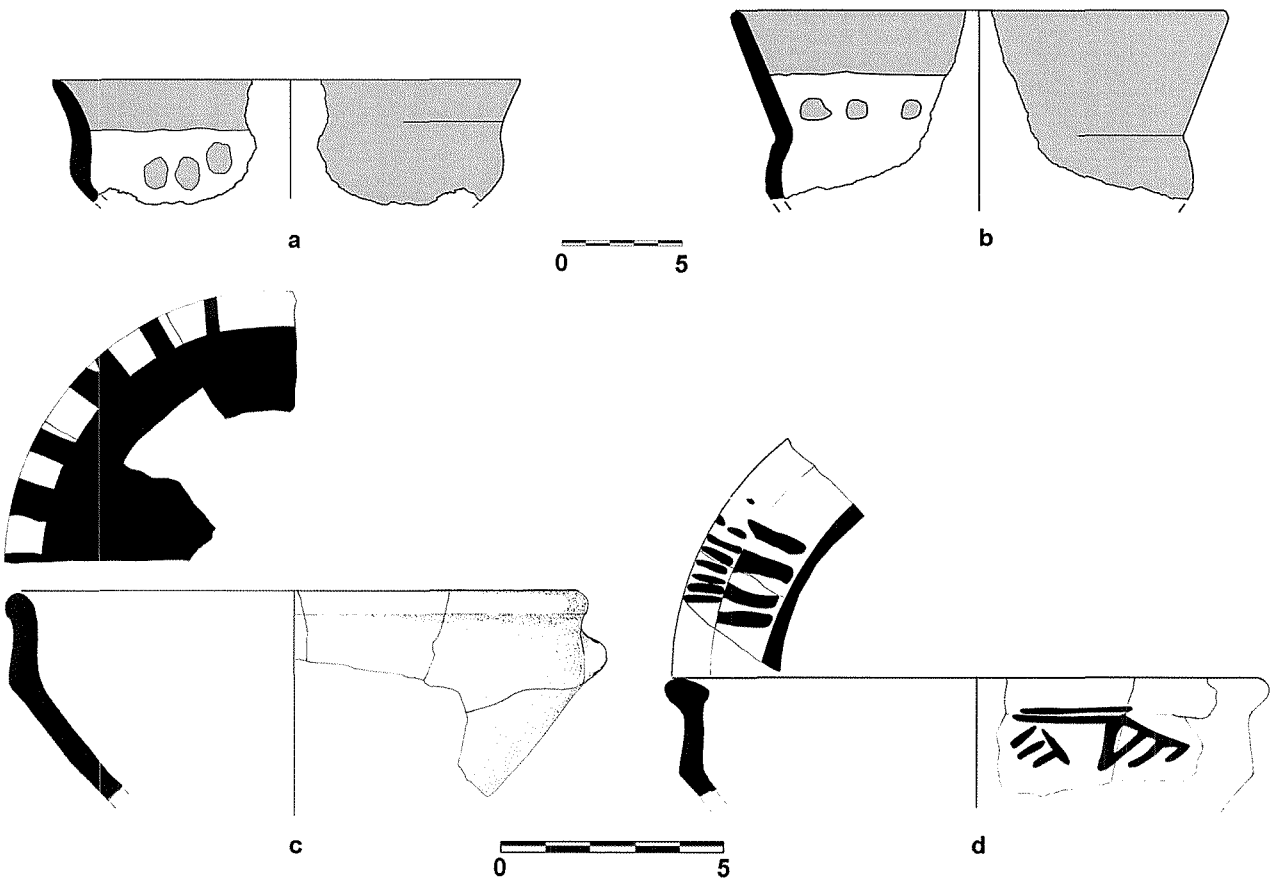

Figure 8. a) NNF60/P/2009/1; b) NNF60/P/2009/2 (scale 1:3, drawing by Carlo Veca); c) Bowl P04/704 from Montagna di Polizzello. d) Bowl 04018 from Montagna di Polizzello (scale 1:4, drawing by Denise Calì).

phases II B1/II B2 and II B2 of the Borġ in-Nadur temple (Tanasi 2011a, 135). In the excavations at Tas-Silġ, examples of dribbled ware have been found in the same layer as the Mycenaean LH IIIB sherd 2169/30 (Sagona 2011, 410), and in other layers on the top of that, all of them sealed (*pers. comm.* N. C. Vella). This datum places the LH IIIB (mid-fourteenth – early thirteenth century BC, a period corresponding to the principal part of Borġ in-Nadur II B2; Tanasi and Vella 2011, 8), as at least the *terminus ad quem* for the production of the dribbled ware. But, as mentioned earlier, in his preliminary report of the excavations at Borġ in-Nadur village and Baħrija, Trump included the dribbled ware in the II B3 period (Trump 1961, 259). This would suggest a longer period of production or use for this class of pottery, possibly well into the opening centuries of the first millennium BC. This would fit chronologically with the appearance of the 'dribbled examples' of Montagna di Polizzello. A connection between the Maltese Archipelago and central Sicily at this time is testified by the Borġ in-Nadur II B3 type bowl from Polizzello and by the Maltese pottery found in the phase III layers at Cannatello (Levi 2004, 237).

If this reading is correct, dribbled ware seems to have been produced using the same criteria for several centuries, from phase II B2 to phase II B3 and with a repertoire of at least two shapes, one of which being the ubiquitous dipper cup. In the conservative nature of this production, ritual practices could have played a major role since symbolic conceptions are considered one of the most conditioning factors of conservative behaviours (Gosselan and Livingstone Smith 2005, 41). This reading could also justify the limited presence of dribbled pottery as in the In-Nuffara deposit. Dribbled ware is also set apart from the rest of the pottery production of Borġ in-Nadur II B2 and II B2 phases. Indeed the fabrics are completely different (Table 2). Dribbled ware appears to be more advanced in terms of purification of clays, manufacturing technique and above all in the control of firing conditions. These special technical features could have represented distinctive characteristics of a pottery class of high level produced perhaps by

the most skilled potters who were responsible for producing the handled bowl for ritual rather than everyday use.

Little is known about the ritual practices of the Borġ in-Nadur period. It is clear that a Maltese ritual vessel set, composed of a two-handled bowl, an open-mouthed jug, and a pedestalled basin, existed and was used in religious and funerary rituals in Malta and in Sicily (Tanasi and Vella in press; Tanasi 2011b, 304). Since this set, in evidence in the Double Chapel of Borġ in-Nadur and in tomb 23 at Cozzo del Pantano and tomb 6 at Matrensa (Tanasi 2008, 77), does not include the handled bowl, and since Murray reported a concentration of dribbled ware near the entrance of the Apsidal Building of Borġ in-Nadur temple and within it (Murray 1923, p. 38), it may be possible to propose that different rituals including different sets of vessels were carried out in the Double Chapel and in the Apsidal Building respectively.

In conclusion, after a century the same problems experienced by Peet in dealing with the prehistoric painted pottery in Malta are still relevant. The recent reappraisal and publication of cultural material, especially pottery, from old excavations and the beginning of a constructive and continuous dialogue between Maltese and foreign scholars are beginning to throw new light on the Maltese Bronze Age. Crucial for an overall improvement will be the final publication of the results of the excavations carried out at Tas-Silġ by the Italian archaeological mission and the University of Malta. No doubt many questions will be answered and not only those related to the pottery that was the subject of this paper.

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Observations on the linguistic epigraphic choice in late antique inscriptions from Malta

Maria Domenica Lo Faro

The aim of this paper is to reconsider the Maltese epigraphic material from a linguistic point of view, with an attempt to point out what the specific linguistic choice means within the epigraphic context. Analysing the epigraphic data, it is possible to suppose that in late antiquity the Greek-speaking community in Malta was linked to a Jewish community maybe coming from abroad. Furthermore, a parallel can be established with the south-eastern area in Sicily, where there is evidence for the presence of Jewish burial places in Christian necropoleis, with the preponderance of Greek used as epigraphic language. The choice of Greek for the funerary inscriptions from Malta does not tend to be arbitrary, and might indicate the persistent use of the original language of an immigrant community.

Early Imperial Inscriptions

What language did the Maltese speak in late antiquity? The answer to this question is not simple. The presence of Neo-Punic funerary inscriptions dated to the second century BC and the first century AD in Taċ-Ċagħqi (Buhagiar 2007, 39, nos 26-27) and in Birżebbuġa, Ħal Far Tomb 3 (Buhagiar 2007, 39 no. 32) testifies that the archipelago maintained a cultural Semitic background into Roman times (Brincat 2008, 237), as can also be proved by the Punic burial places which remained in use until the second century AD (Buhagiar 2007, 11). But since the island was annexed to the Sicilian province as a result of the Roman conquest in 218 BC, as reported in Livy (*Ab urbe condita* 21.51; Dorey 1971, 50-51), the official language was obviously Latin. All the honorary inscriptions were written in Latin, apart from a few exceptions: a funerary inscription refers to Lucius Kastricius Prudens, a knight, called πρῶτος Μελιταίων 'the first of the Maltese' and πάτρων '*patronus*', dated to the first century AD (*IG* XIV 601); a fragment of marble slab with an inscription that makes possible reference to an archon (*IG* XIV 602); and a funerary inscription found in the Taċ-Ċagħqi area (Rabat) (Fig. 1), that commemorated the actor Πόπλιος Αἴλιος Ἑρμόλαος, coming from Pergamon and probably a Greek native speaker (Cassia 2008, 165-66). The choice of Greek, in this last instance, could be related to the desire to affirm the cultural origin of the deceased; alternatively, it could be a manifestation of cultural affinity, because Greek enjoyed prestige and was the high language used at the time.

What follows is a transcription of these three inscriptions.

(*IG* XIV 601)

Λούκιος Κα[στρί]κιος Κυρ(ῖτες)
Προύδηνς ἱππεύς Ῥωμαίων πρῶτος
Μελιταῖων καὶ πάτρων ἄρξας καὶ
ἀμφιπολεύσας
θεῷ Αὐγουστῷ
[---]ΕΣΧ[-]Ν[---]Ε[-]ΙΝΕ

(*IG* XIV 602)

ΒΕΛΛ[.]Ἑρμες (sic)
τῷ αρχ[---]

(Cassia 2008, 165-66)

χαῖρε
Π(όπλιος) Αἴλιος Ἑρμόλαος
Περγαμηνός κωμῳδός
καὶ λυριστής, ἐβίωσεν
ἔτη κε′ ὑγίαινε.

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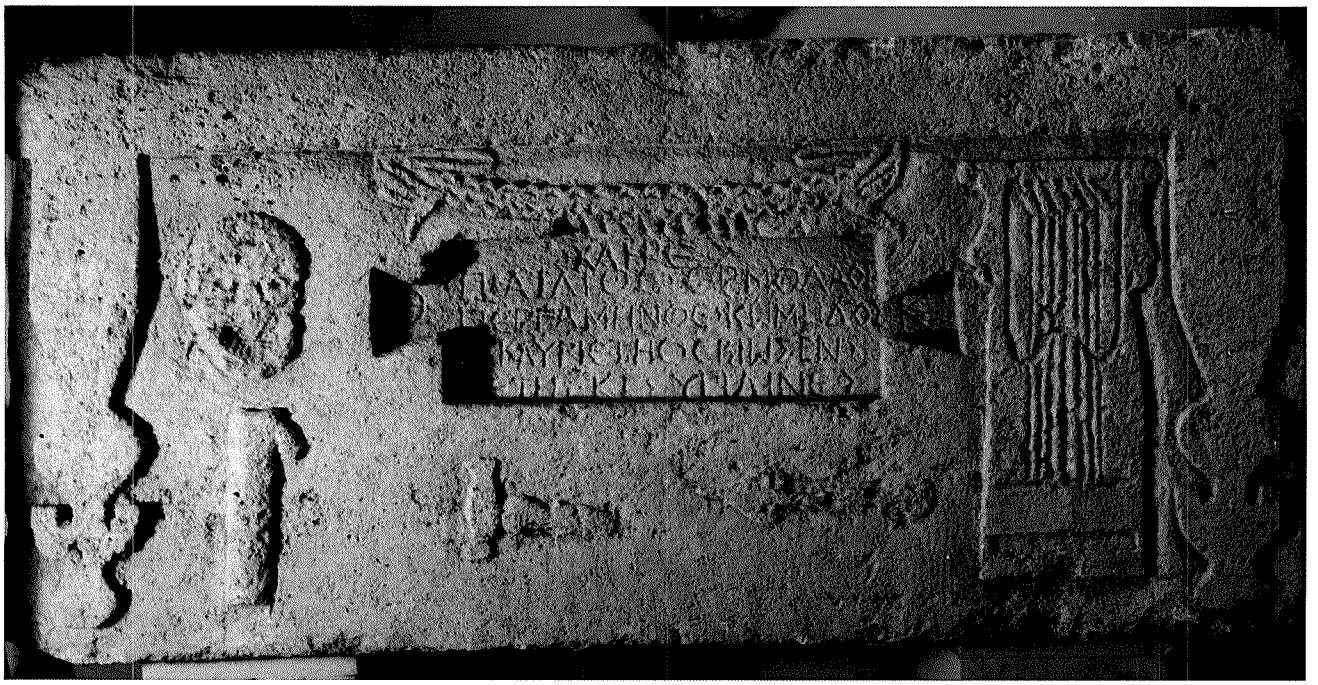

Figure 1. Inscription of the actor *P. Aelios Hermolaos* (photograph by Vittorio G. Rizzone)

On the other hand, the greater part of the epigraphic heritage of the archipelago in Roman Imperial times was written in Latin. Also the rare epitaphs are in Latin: an inscription discovered in the Jesuits Hill area, Marsa, seems to refer to a non-Christian burial dated to the third century AD, on the strength of the invocation to the *Manes (CIL* X 8319 add. = Buhagiar 2007, 40, no. 34):

D(is) M(anibus)
[F]lavius Titus
vixit annos
LV cives be-
nemerenti
fecerunt

Besides, a fragment of a slab with a Latin funerary inscription discovered in 1760 by Agius de Soldanis in St. George's Church, Rabat (Gozo), published by Caruana (1882, 143), could refer to a Roman burial of the Imperial era:

[---]Aur[e]l[ia]
qua v[ix]i[t annos]
[quinqua]ginta gi[---]
[---]calend[as]

Nevertheless, both cases mentioned above are decontextualized and it would not be correct to speculate upon them.

Late antique Inscriptions

Coming to late antiquity, as Buhagiar states, 'the inscriptions from the Maltese catacombs are disappointingly few and often uninformative' (Buhagiar 2007, 32), but not from a linguistic point of view. The 39 late antique inscriptions that have so far been noted (Buhagiar 2007, 36-40) are epitaphs from funerary contexts. To these we must add two inscriptions recently discovered in St Agatha's rock-cut church, Rabat (Rizzone 2009, 203-205).

The greatest number of the late antique sample, 33 inscriptions in total, comes from the suburban catacombs of Rabat. One was found in Marsascala, three in the Marsa catacombs and two come from rural sites (Buhagiar 2007, 32).

From a linguistic point of view, 18 texts are in Greek, 16 in Latin. Although one inscription has been published as a Greek text (Buhagiar 2007, 37 no. 16), it was actually written in the Neo-Punic alphabet as confirmed to me by Prof. Felle and Prof. Lacerenza who were shown a photograph of the inscription. The presence in a funerary context of three Neo-Punic inscriptions, although illegible because of their poor state of preservation, testifies to seemingly widespread evidence of the cultural Semitic substratum, that appeared in inscriptions carved on plaster near the graves in several hypogea in Rabat (Buhagiar 2007, 36, no. 5; 37, nos 9 and 16). One can point out the

significant slight predominance of Greek, which was linked with the intellectual climate of Roman Malta, very close to the Greek tradition (Buhagiar and Fiorini 1996, 19). Without doubt one cannot notice in the epigraphic finds of the Maltese catacombs the great preponderance of inscriptions in Greek highlighted in the material from the late-antique catacombs of Syracuse (Korhonen 2002, 70-74). In fact, Mariarita Sgarlata pointed out that, in the middle of the fifth century AD, the epigraphic finds from the catacombs of Syracuse and the countryside show that the dominant language was Greek, probably linked with the presence of a strong ethnic Greek substratum (Sgarlata 1999, 491-92; 2003, 111).

Instead, and even though language choice is a result of family conventions consonant with the belonging to a specific social group, it is possible that linguistic choice was not necessarily connected with family use, above all in a situation of clear bilingualism. To this end, the presence of a bilingual inscription seems remarkable: it was recently discovered in Rabat and published by Rizzone (2009, 204-205). The inscription shows both a Greek and a Latin text: this could reveal a situation of real bilingualism on the island. The person who commissioned the inscription could be a Latin speaker, unwilling to move away from the traditional epigraphic usage, which seems to choose Greek as the 'official' language. The inscription is painted on the right wall of the entrance of St Agatha's rock-cut Church, in a *tabula* 36 cm x 44 cm, with letters 3 cm high (Rizzone 2009, 204-205):

[Hic requiescit] Basileus senior e
[vita exiens vixi]t an<n>os LXXVI,
[mense]s [---]et [die]s XVI.
[Ἐξελθών ἐκ] τοῦ βίου Βασιλεύς
[---δοῦλος (?)] Θεοῦ ἤζησεν
[ἔτη ος', μῆνας .., ἡμ]έρα[ς] ις'
[---]
[---]

Antonio Felle analysed the bilingual epitaphs of Rome, pointing out that the recurrence of the phenomenon is meaningful in both Christian and Jewish inscriptions, and it is particularly widespread in Rome in the sixth century AD (Felle 1999, 669-72).

The late antique inscriptions found in the catacombs and burial places relate to a narrow section of Maltese society. Even if the sample is small and unbalanced, and probably suffered from deterioration and other damage, it seems that suddenly the epigraphy rediscovered the use of Greek as official language. But what is the reason for this language choice? It is possible, as held by Brincat (2008, 238), that Greek replaced Latin in Malta in the Byzantine period, but the Maltese inscriptions are not different, from an epigraphic point of view, from the Roman and Sicilian material dating to the middle fourth and the fifth century AD, thus predating the Byzantine period. As to the epigraphic formulary, in fact, wording like *in hoc loco iacet*/ἐνθάδε κεῖται ('here lies') is predominant in the Maltese inscriptions. It is very widespread in Roman epigraphy of the fourth and fifth century AD (Carletti 1997, 160; 2008, 118-20), and is considered peculiar to the Christian funerary epigraphy of Syracuse (Korhonen 2002, 74). One can find it in five inscriptions (Buhagiar 2007, 36, no. 3, 37 nos 15 and 17, 38, nos 20-21). According to Rizzone (2009, 206-207; 2011, 119), this phrase was written at the beginning of another two fragmentary epitaphs. Wording like *situs est* (Buhagiar 2007, 36 no. 4, integrated by Antonio Ferrua's drawing), and τόπος with the name of the deceased in the genitive form (Buhagiar 2007, 37 no. 10) are also to be found. This formulary is often found in the Roman material, as Carletti claimed (Carletti 1997, 160; 2008, 119). The whole wording reflects the convention of the funerary epigraphy in the west Mediterranean area between the end of the fourth and the beginning of the fifth century AD (Buhagiar 2007, 32; Carletti 2008, 118-23).

The reason for a linguistic choice that seems to prefer Greek for funerary use could be related to a different religious ideology, possibly linked to a group coming from abroad, developed deliberately differently, maintaining the traditional usage. Furthermore, in the matter of personal names, one can notice that the greater part is Greek, sometimes transliterated into Latin.[1] Only three names are certainly Latin.[2] This could be an indication of the foreign provenance of the family of the deceased. In addition to this, an inscription in St Agatha Catacomb 17 (Buhagiar 2007, 37, no. 10) shows two names (Fig. 2): it might be a sign of the conversion of a woman who chose the traditional name Εἰρήνη when she became Jewish; this name is widespread in Sicily and it is considered as the Greek equivalent of *Salome* (Rizzone and Sammito in press).

The Jewish Maltese community, according to Frey (*CIJ*, 471 no. 655), was made up of Greek native speakers coming from Alexandria. Becker (2009, 80-81) was of the same opinion. With regard to the epigraphic material, one can assign to a Jewish origin six Greek

inscriptions: two come from St Agatha Catacomb 17 (Buhagiar 2007, 37, nos 10-11), where a *menorah* was carved above the entrance; one, from SS Paul/Agatha 13 (Buhagiar 2007, 37, no 14), mentions a γερουσιαρκής (gerousiarch), a man who filled a very important post in the Jewish community (Noy 1999, 608-609), as well as his wife Eulogia called πρεσβυτήρα, but it is uncertain if this was a honorary epithet or whether the deceased occupied a real official function in the community (Noy 1999, 611; Buhagiar 2011, 83-84). Two signs lead us to affirm that a Jew commissioned it: a *menorah* carved on a doorway of the hypogeum and another one in relief between two headrests in a tomb (Buhagiar 2007, 36, app. 2, no. 5; Noy 1993, 221). Furthermore, two other inscriptions from SS Paul/Agatha 14 (Buhagiar 2007, 37, nos 15-16), despite no express reference to any religious denomination, are considered Jewish because of the seven-branched candlestick carved on the wall of the hypogeum.

What follows is a transcription of the above-mentioned inscriptions:

(Buhagiar 2007, 37, no. 10) (Fig. 2)
τόπος Διονυσίας
ἡ κὲ Εἰρήνας
((menorah))

(Buhagiar 2007, 37 no. 11)
βωηθησον (sic) τοῦ Μαν[---]
ισ[---]ριπε[---]οι [---]κ[-]ιτο

In the first line, βωηθησον is the incorrectly rendered transcription of βοήθησον.

(Buhagiar 2007, 37, no. 14, re-read by Rizzone 2011, 119)
[Ἐνθάδε κατάκεινται ?]
γερουσιαρχής φιλεντ[όλιος]
καὶ Εὐλογία πρεσβυτήρα ἡ αὐτοῦ συμβίος

(Buhagiar 2007, 37 no. 15, Rizzone 2009, 202)
ἐνθάδε [κειται---]
[Γ]α[λ]ήνη θυ[γάτηρ ---]
[ἀπ]ώλε[το ---] Ε
[---]ΕΜ[---]
[--- ἐν εἰρή]νῃ
[ἡ κοίμησις αὐτῆς]

In this last case, the use of the wording ἐν εἰρήνῃ ἡ κοίμησις αὐτῆς, 'in peace may she rest', according to the integration proposed by Rizzone (2009, 203), was common in Jewish inscriptions,

Figure 2. Inscription of *Dionisia*, also called *Eirene* (photograph by Vittorio G. Rizzone)

Figure 3. Inscription of *Leonias* (photograph by Vittorio G. Rizzone)

and recalls the word κοιμητήριον, which can be found in an inscription from Marsa, hypogeum I Jesuits Hill (Buhagiar 2007, 39, no. 33). Within this context, it is interesting to highlight the mention of the purchase of the tomb. According to Carletti, this record is common in inscriptions dated from the middle fourth century AD onwards (Carletti 2008, 97-100), and it is observed in the epigraphic material from San Giovanni Catacombs in Syracuse (Felle 2005, 247). In the Maltese inscription, the word κοιμητήριον with reference to the burial place could be related to Jewish tradition, since it recalls the wording ἐν εἰρήνῃ ἡ κοίμησίς σου, widespread in the Roman Jewish epigraphic formulary (Nuzzo 2005, 113-17). Here is the transcription of the text (Buhagiar 2007, 39, no. 33, re-read by Rizzone 2009, 207):

κοιμητήριον
ἠγορασμένον
ἀπὸ Ζωσίμη[ς]
τίνος καὶ ἀνί-
κη.

Furthermore, another Greek inscription (Fig. 3) found in St Agatha Catacomb 2, despite showing neither specific Jewish nor Christian indicators, has a parallel in an epitaph from the Jewish catacomb of Via Appia Pignatelli in Rome, as Becker (2009, 107 and 120-21) noticed. The inscription is painted in white letters 4 cm high on a red background, in a *tabula biansata* 34 cm x 49 cm supported by two *genii*, vandalized in ancient times (Becker 2009, 120-21). Here is the text transcribed, according to Buhagiar (2007, 36 no. 6):

[---]
πρὸ [--- κα]λαν-
δῶν σεπτέ<μ>-
βριου ἀπόθεσι[ς]
Λεωνίας.

The Jewish community in Malta had reserved burial spaces close to Christian funerary spaces, in a climate of 'friendship and co-operation between the two religious communities' (Buhagiar 2007, 55; Becker 2009, 65-66). The presence of burials of persons of different religious faiths is testified in Sicily: e.g. in Lipari in the third and the fourth century AD we find the coexistence of Jewish and Christian tombs in the same area, as we also find in Marsala (Bonacasa Carra 2005, 143-44; 2007, 139-40). The presence of Jewish communities is reported in the Hyblean area, where a few small hypogea were noted with specific signs carved on the walls, like the seven-branched candlestick (Di Stefano 2005, 103-105; Di Stefano *et al.* 2007, 239).

In Sicily, Jewish inscriptions are generally in Greek: as Rutgers (1997, 246) stated, twelve of the thirteen inscriptions from Sicily that are certainly Jewish were carved using Greek. Three of them commemorated *presbyteri*, two from Catania and one from Sofiana (Caltanissetta) (Rizzone 2011, 88-89 and 119-21). In addition to these, we can refer to two inscriptions from Syracuse showing a menorah carved on the slab: one from hypogeum Cappuccini XI (Orsi 1900, 193-94), and the other one of unknown provenance that probably commemorated a *diaconus* (Rizzone 2011, 129 and 139). These inscriptions seem to testify the presence of a well-structured community. As Orsi assumed, the Jewish community in Syracuse was made up of Greek native speakers, with a strong cultural Greek substratum (Orsi 1900, 198).

Furthermore, a Jewish community coexisted with the Christian one in Jerba, where, according to Fentress, the first Jewish community arrived in the fourth century BC with Phoenicians traders and the main group took over the island in the first century AD, after the *diaspora* of AD 70 (Fentress *et al.* 2009, 16).

Conclusion

The Christian community in Malta, as Buhagiar (2007, 55) argued, could have developed from the Jewish pre-existing one, maybe under the influence of the evangelisation carried out by the Sicilian clergy, maintaining the epigraphic use of Greek as a traditional language, usual in the Jewish inscriptions. Recently, Buhagiar pointed out that 'the exclusive use of Greek in the surviving Maltese inscriptions seems to suggest an essentially Hellenized colony, possibly with close association to Sicily' (Buhagiar 2011, 80). The preference of Greek as official language need not reflect a real 'Hellenization' of the society of the time, but could represent a symbolic choice linked to a peculiar funerary epigraphic tradition. It could be that the community tried to preserve the traditional language as a result of the control of the assembly that coordinated the activities of the community itself, as has been claimed for the Sicilian evidence (Rizzone and Sammito in press). Then, when the Christian community became larger and more dominant than the Jewish one, Latin was re-established alongside Greek. The bilingual inscription from St Agatha's rock-cut church would appear to be a compromise between traditional use, which chose Greek, and the current language, which was Latin.

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Notes

1 As one can extrapolate from the table published by Buhagiar (2007, 32), these names are: Ἐυτυχίον, Λεωνίας, Ἐρένης for Ἰρενέος, Διονυσία called also Εἰρήνα, Εὐλογία, Γαλήνη, Αὐρηλία Ἑορτὴ, *Basileus*, Δομέστικος, Ἐυτυχιανος, *Dionisia*, Ζωσίμη, *Aurelia*, Κρίσπια.

2 *Desiderius*, *Ascanius*, *Flavius Titus* (Buhagiar 2007, 32)

Ancient anchors from Malta and Gozo

Elaine Azzopardi, Timmy Gambin, Renata Zerafa

In 2011, the national archaeological collection managed by Heritage Malta included 24 lead anchor stocks. They are the remains of ancient wooden anchors used on boats that sheltered in the harbours and bays of the Maltese Islands. This paper includes a gazetteer documenting these stocks with the aim of highlighting their value to maritime archaeology and to create a tool that will facilitate further study.

Anchors form part of the basic equipment of seagoing vessels. Although they are used to 'attach' a vessel to the seabed, an anchored boat is not stationary as it moves with the wind and currents. Anchors can also be deployed whilst underway to increase stability and manoeuvrability in bad weather. Furthermore, their use as votive offerings (Frost 2001) and inscriptions of names of deities on stocks highlight their importance to ancient seafarers.

One cannot be sure how many anchors ships carried. Numbers found differ from site to site. For example, the second millennium BC Ulu Burun shipwreck was carrying 24 stone anchors but it is not certain how many were carried as cargo (Pulak 1998). The seventh century AD Yassi Ada shipwreck carried 11 anchors, indicating the necessity of carrying spares on board (Bass and van Doorninck 1982). Greek and Roman period ships may have carried between five and ten anchors (Beltrame 2002, 18).

From an archaeological perspective the value of lead anchor stocks has been underestimated. Many were found by sports divers and given to local heritage authorities without much contextual detail. These solitary objects do however have a story to tell. An ancient stock on the seabed accounts for the presence of one ship in the area. Its indicative value for maritime activity equals that of a cargo of amphorae on the seabed. Therefore the study of entire collections and the placing of these in a broader context will help further our knowledge of the maritime activity within an area.

When undertaking such a study it is important to keep the following in mind:

1) There is a correlation between the popularity of dive sites and the discovery of anchor stocks.
2) Although many stocks were given to heritage authorities others were kept or melted down to produce diving weights. This distorts the picture of quantification and distribution.
3) Sedimentation in many Maltese bays has buried archaeological layers. Mattes of the seagrass *Posidonia oceanica,* that further conceal objects of archaeological interest, are also widespread.
4) The discovery of anchor stocks was not always well documented. Linking the stocks in the collection to reported discoveries depends on the interpretation of images and recorded dimensions when available. If this cannot be done they are referred to here as unprovenanced.

This paper covers anchors recovered and recorded by Heritage Malta up until December 2011.

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Typology

The lead stocks and collars discussed below were components of one type of ancient wooden anchor. Others include wooden anchors with stone stocks and anchors that had wooden stocks filled with lead (Kapitän 1984, 36; Haldane 1984, 3), none of which have been found in Maltese waters and they are therefore outside the scope of this paper.

The use of lead stocks on wooden anchors is considered to be a Roman practice (Haldane 1990, 22). A lead stock found off the Portuguese coast provides the earliest date for this type of anchor. C^{14} analysis dates the wooden core to between the fifth and fourth century BC (Purpura 2003). The subsequent proliferation of lead stocks in the Mediterranean has been linked to the Romans gaining control of Spanish silver mines by the third century BC and the development of increasingly efficient mining techniques which produced lead as a by-product (Haldane 1990, 22). Lead stocks were used throughout the Roman period and the last securely dated one is from the third century AD (Haldane 1984, 13; Purpura 2003).

During this time lead stocks did not undergo major changes that could provide an accurate dating tool. Given this and the fact that their use spanned hundreds of years, they are usually dated according to their archaeological context. Unfortunately, a number of the stocks held by Heritage Malta do not have any secure provenance and therefore, no context. Others, such as those found at Għallis, Delimara and Swali (Fig. 2) are the only objects recorded from these areas and cannot be cross-dated with other finds. In effect, they have a geographical context but not an archaeological one. Those from Salina, St. Paul's Bay, Qawra, Ramla, Xlendi and Comino come from areas where other objects of varying dates were discovered, again making it difficult to cross-date them.

However, some aspects of lead stocks can be used to indicate a relative position in their evolution (Kapitän 1996, 577). There are currently two main typologies that are used to differentiate lead stocks, one proposed by Kapitän and another by Haldane, as illustrated in figure 1.

Kapitän distinguishes four types of stocks used on wooden anchors (Fig. 1): stone, wooden ones with a lead core, lead stocks and wooden stocks with a lead coating (Kapitän 1984, 36-38). The latter two, his types 3 and 4 are the subjects of this discussion. Within type 3 i.e. lead stocks, Kapitän recognises four sub-types (Kapitän 1984, 38). Type 3a are lead imitations of

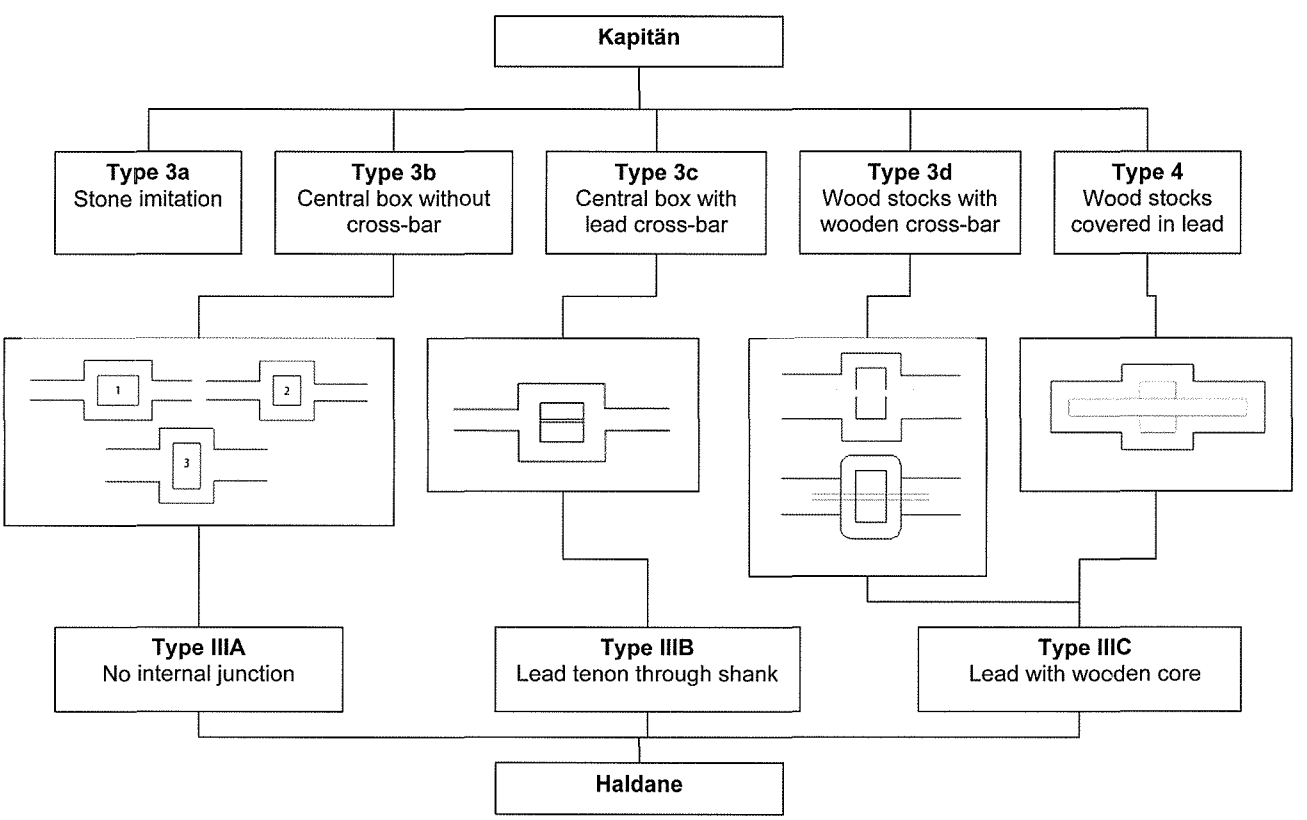

Figure 1. Comparison of the two main typologies of lead stocks by Kapitän and Haldane.

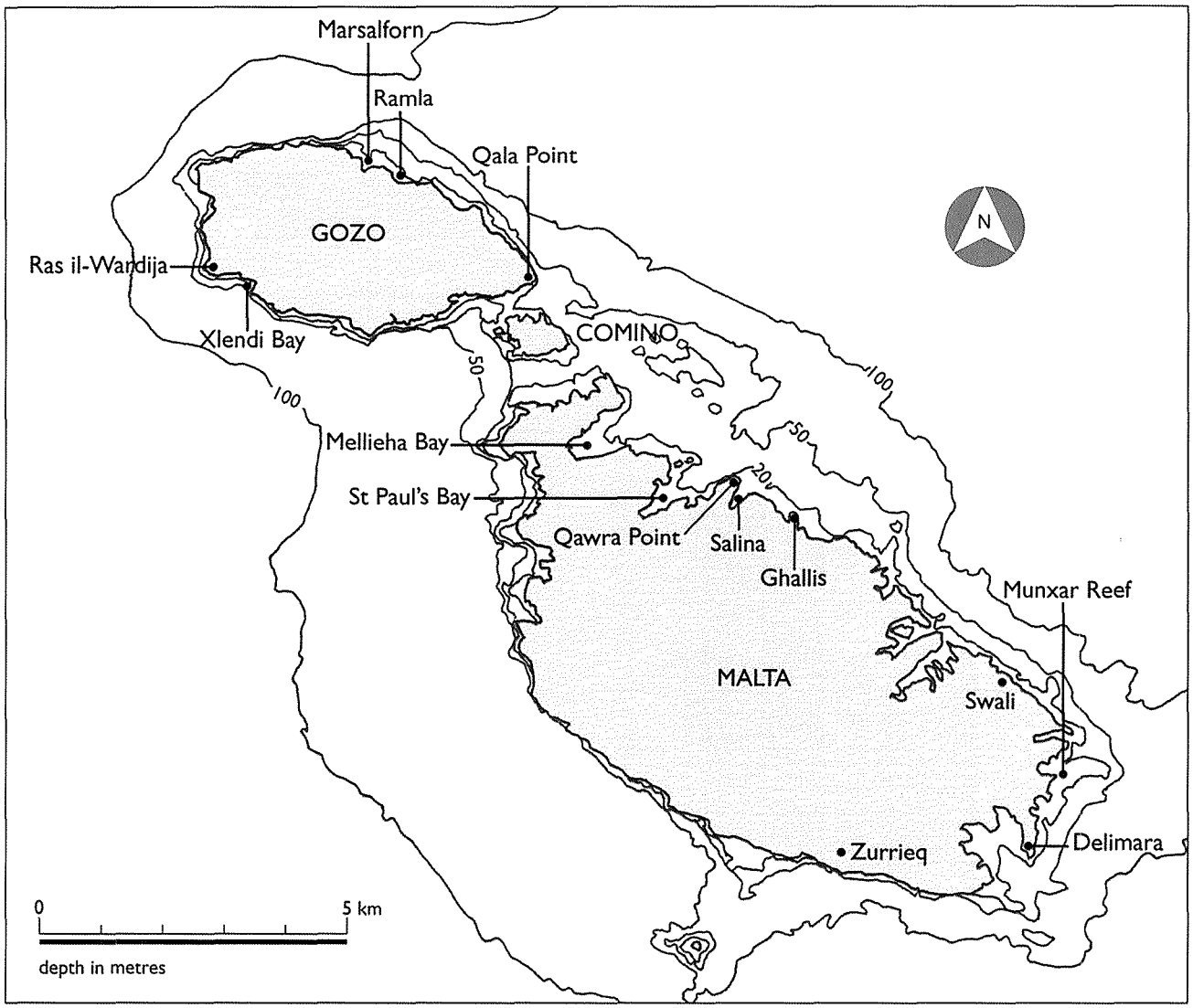

Figure 2. Location of principal sites mentioned in the text (drawn by Renata Zerafa and Maxine Anastasi).

stone stocks. Type 3b includes lead stocks that do not have a cross-bar in the central box and are therefore not integrally linked to the anchor's shank. He further suggests that the orientation of the central box relative to the rest of the stock changed over time (Fig. 1) and that the final orientation was the most suitable for efficiently lifting the anchor off the seabed.

Type 3c are stocks that have a lead cross-bar in the central box (Kapitän 1984, 38). The cross-bar is an integral part of the stock showing that this type was cast onto the wooden shank during manufacture. Type 3d stocks had wooden cross-bars to attach the stock and the shank instead of lead ones (Kapitän 1984, 38). They are identified by the holes in the side of the central box that extend into the arms depending on the length of the original wooden tenon. These stocks were also cast onto the wooden shank and not attached later. The outside of the central boxes of type 3d stocks can be rectangular or rounded. Rounded edges may have been a technological development on the rectangular ones (Kapitän 1984, 38). Type 4 are wooden stocks with a lead coating. Kapitän considered these to be technologically advanced as the large wooden element offered more resistance to the physical stresses anchors were subjected to (Kapitän 1984, 38).

The second typology is Haldane's. His type IIIA is solid lead with no inherent attachment to the wooden shank (Haldane 1984, 3), comparable to Kapitän's type 3b. Haldane type IIIB are solid lead stocks with a lead tenon (Haldane 1984, 3), equivalent to Kapitän's type 3c. Finally, Haldane type IIIC stocks are lead stocks with a wooden core (Haldane 1984, 3). Haldane does not distinguish between stocks with a significant wooden element or stocks that only have

a wooden attachment bar. Therefore, this type IIIC includes stocks of Kapitän's type 3d and 4.

Lead stocks were made by pouring molten lead into a mould of sand and/or clay or even cut into the ground (Haldane 1984, 27; Gargiullo and Okely 1993, 79). Any markings, such as letters, astragals or images were made by pressing the marker into the side of the mould (Haldane 1984, 27, 28). The shaft with either a hole to allow a lead cross bar to form or with a wooden attachment already running through it was lowered into the mould and the stock cast around it (Haldane 1984, 27). Pieces of stone, pottery or other material would have been placed under the wooden arms of Kapitän type 4 and Haldane type IIIC stocks to keep them level (Haldane 1984, 29).

Gazetteer

Below is a description of the lead anchor stocks managed by Heritage Malta. They are described according to Kapitän's typology, which is more detailed. This does not necessarily correspond to their chronological order that is still unknown due to lack of information about their archaeological contexts.

Two stocks were used in reconstructions of ancient wooden anchors. One is in the Maritime Museum and the other is in the Gozo Museum of Archaeology. The first uses a stock discovered off Delimara in 1966 (DEL 1967/M/1, Cauchi 1967, 7). It is small with a total length of 1.02 m. The second uses a 1.13 m long stock (XLN/M/32546) and collar found at Xlendi in 1961 (Zammit 1961, 7). Both are currently part of reconstructed display anchors so it was not possible to determine their type.

Kapitän 3c: stocks with a central cross-bar

KEM 1996/M/1

This stock is 1.6 m long and has a rectangular central box that is 17 cm long and 12 cm wide. One of the arms is bent. It is labelled as found on the seabed in Comino in 1996 and is now kept at the National Museum of Archaeology.

GLS 1963/M/1

This stock, currently on display at the Maritime Museum, was recovered off Għallis in 1963 (Zerafa 1963, 7). It is 1.78 m long and one of the arms is bent. The central box is 22 cm long and 15 cm wide (Fig. 3d).

SAL 1962/M/1

This stock discovered in Salina Bay in 1961 (Zammit 1962, plate 6) is 1.88 m long with one bent arm. The box is 20 cm long and 15 cm wide. An interesting feature is that deterioration of an arm shows that at least one part is hollow with a central longitudinal partition. This indicates it was not cast of solid lead, or even around a single wooden core (Fig. 3e). It is on display at the Maritime Museum.

SAL 2004/M/1

This large stock measures 2.25 m in length with a central box that is 37 cm long and 29 cm wide. It was found off Salina Bay in 2004 and can now be seen at the Maritime Museum. It has the words ISIS cast onto one arm and SARAPIS on the other.

UNP/M/504

This stock may be one of two discovered in Mellieħa Bay in 1965 (Mallia 1965, 5). It is on display at the Maritime Museum and is 1.25 m long and has a rectangular box that is 16 cm long and 11 cm wide. Four astragals or letters are cast onto one of the arms but are difficult to decipher under marine growth (Fig. 4a).

UNP/M/506

It is not known where this stock was found but its dimensions indicate that it may be the one found off Delimara in 1965 (Mallia 1965, 5). Currently on display in the Maritime Museum, it is 1.29 m long and has a central box 20 cm in length 12 cm in width (Fig. 4c).

UNP/M/ 507

This is a small stock with a total length of 1.03 m and a central box 11 cm in length and 8 cm in width. It is on display in the Maritime Museum and may be the stock discovered in Ramla bay in 1962 (Zammit 1962, 7) (Fig. 4d).

UNP/M/7/1

This lead stock is potentially one of the artefacts found on the Munxar reef and obtained by the Maritime Museum under a temporary amnesty to private individuals in the 1990s. It is 1.64 m long and the central box is 18 cm long and 11 cm wide (Fig. 4g).

UNP/M/505

This stock is still unprovenanced but can be seen at the Maritime Museum. One of the arms is bent and

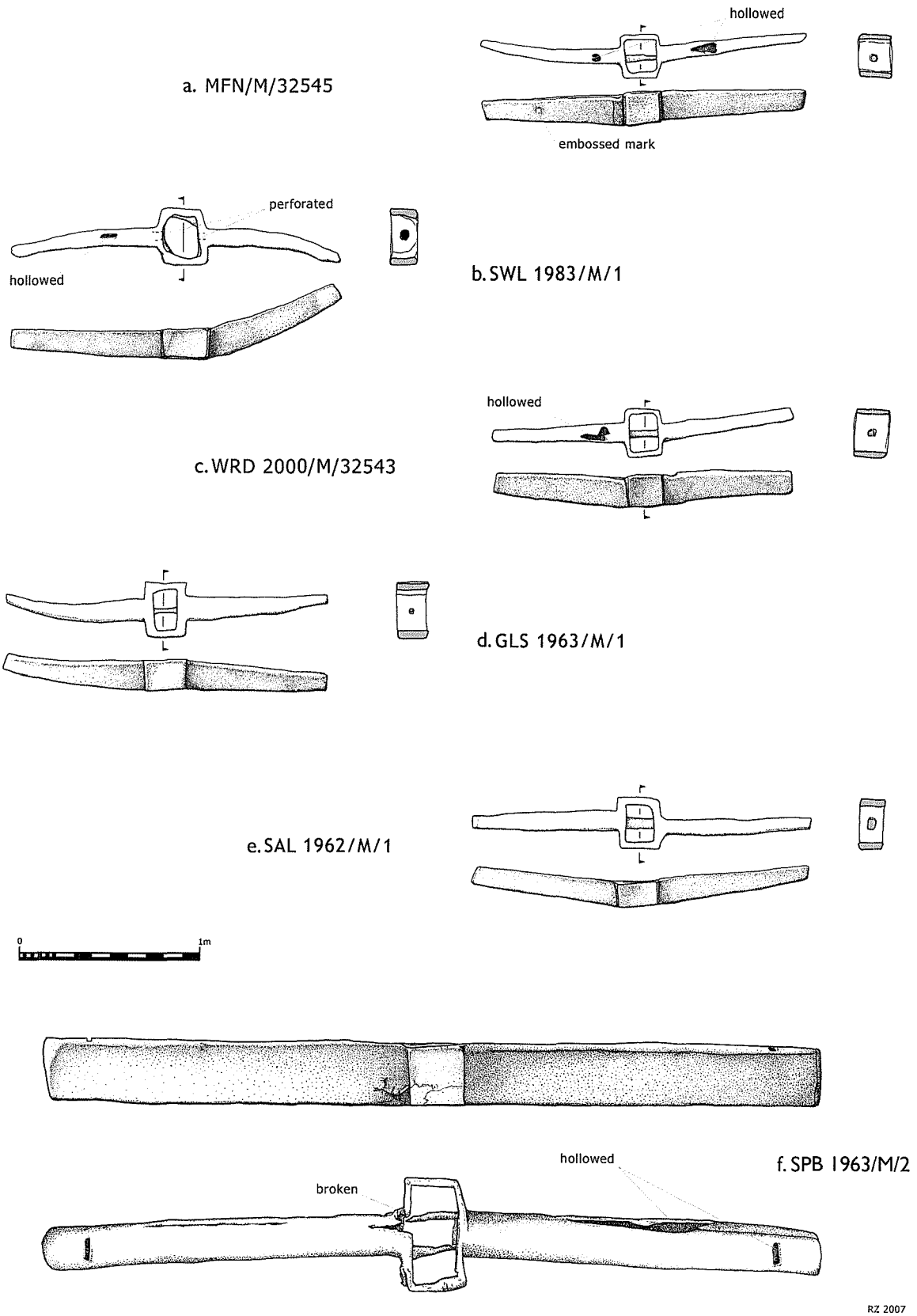

Figure 3. A selection of lead anchor stocks (drawn by Renata Zerafa).

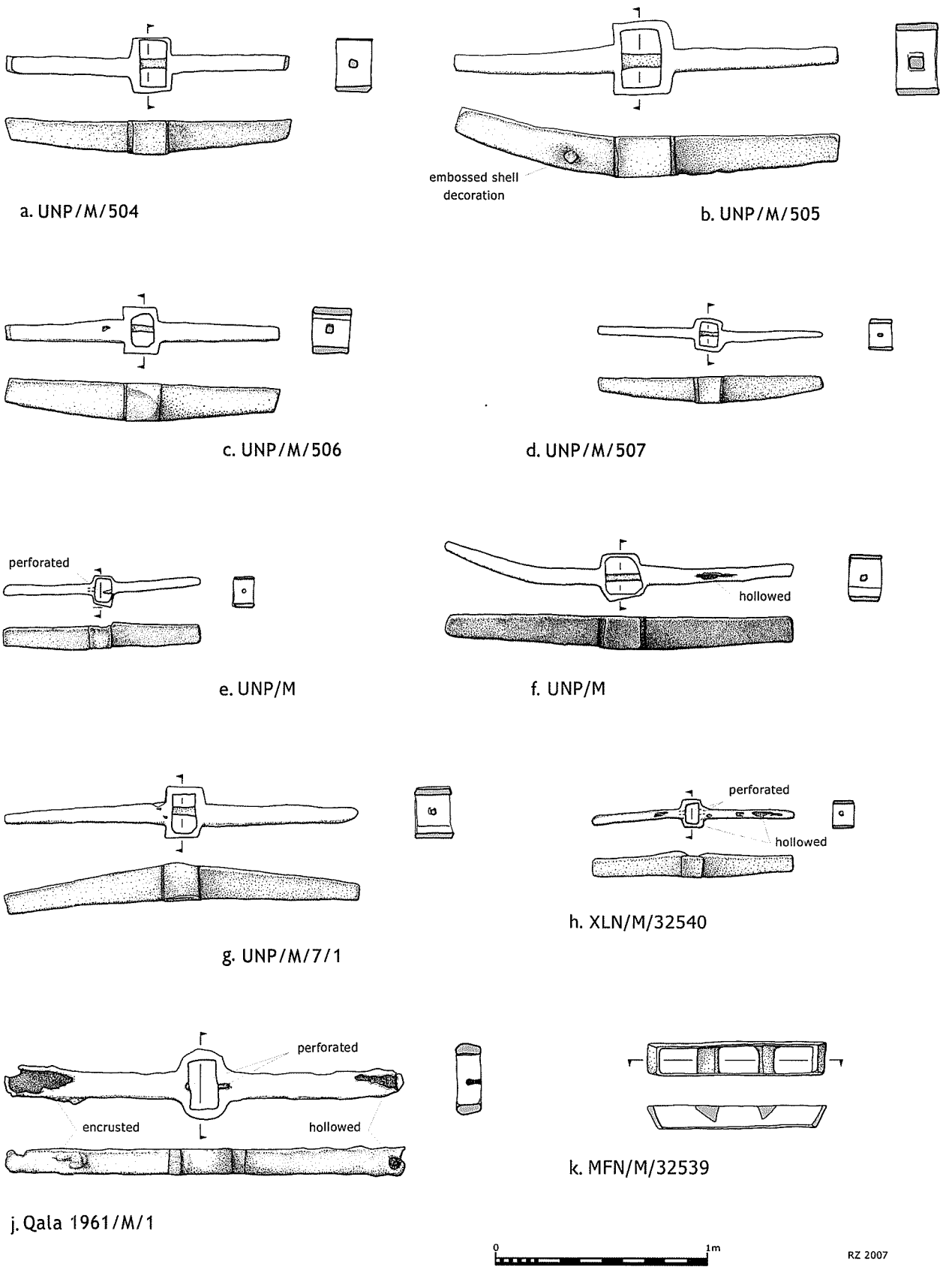

Figure 4. A selection of lead anchor stocks (drawn by Renata Zerafa).

has a shell cast on one side and four letters or astragals on the other. Another shell was cast on to the second arm. It is 1.77 m in length with a large central box that is 27 cm long and 19 cm wide (Fig. 4b).

UNP/M/ 508
This stock is held in the reserve collection of the National Museum of Archaeology. It is 1.85 m long with a central box that measures 22 cm in length and 18 cm in width. Both arms are bent and one has four astragals. An unusual feature is a hollow groove running down the centre of the cross bar.

MFN/M/32545
This stock, on display in the Gozo Museum of Archaeology, was found in Marsalforn in 1961 (Zammit 1961, 7) and is 1.81 m long with a central box 23 cm wide and 20 cm long. One of the arms is slightly bent (Fig. 3a).

WRD 2000/M/32543
This stock, discovered off Ras il-Wardija in 2000, is now on display at the Gozo Museum of Archaeology. It is 1.67 m long and has one bent arm. The central box is 21 cm wide and 15 cm long (Fig. 3c).

XLN/M/32542
This stock measuring 1.18 m in length is the largest of three found in Xlendi Bay (Zammit 1961, 7). The central box is 8 cm wide and 13 cm long. It was originally reported to have four letters cast on its side (Zammit 1961, 7). However, there are traces of five features on one side and four on the other of the central attachment. These features do not appear to be letters but may be astragal bones from a *iactus Veneris*, or a lucky throw in the Roman game of *Tali* (Radić Rossi 2005, 34).

UNP/M
This lead stock measures 1.64 m in length. It has one bent arm and a central box that is 19.5 cm wide and 13.5 cm long. Its provenance is still unknown but it is on display in the Gozo Museum of Archaeology (Fig. 4f).

Kapitän 3d: lead stocks with a wooden cross-bar
SWL 1983/M/1
This stock was found off Swali in 1983 (Zerafa 1983, 1) and is on display at the Maritime Museum. It is 1.81 m in length and both arms are bent. The central box is quite large and measures 23 cm in length and 19 cm in width with hollows on either side for the wooden lynchpin (Fig. 3b).

UNP/M/NMA 7/2
This stock, currently on display in the Maritime Museum, is possibly another from the Munxar reef. It is 1.18 m long and has a central box that is 13 cm long and 9 cm wide and rounded on the outside. A longitudinal partition in the arms shows that they are at least partly hollow.

UNP/M/502
This stock is currently part of the reserve collection of the Maritime Museum. It was approximately 1.5 m long but is now broken into two pieces. A small lead bar is kept with the stock but it is unclear if or how it formed part of it.

XLN/M/32540
This stock, on display in the Gozo Museum of Archaeology, is another from Xlendi (Zammit 1961, 7). It is 94 cm long with a central box that is 6.8 cm wide and 10.5 cm long. Holes in the sides of the box show that the wooden tenon extended 20 cm into each arm (Fig. 4h).

UNP/M
With a total length of 91 cm and a central box that is 8 cm in width and 11 cm in length, this stock is one of the smaller examples. It has a piece of partially decayed lead on one side of the box just in front of the cavity left by the wooden lynchpin. The lead would have seeped into any space left between the shaft and the tenon during casting. It can be seen in the Gozo Museum of Archaeology (Fig. 4e).

Kapitän 4: Lead stocks with a wooden core
QWR 1967/M/1
This small stock is now in two pieces. Its complete length is 62 cm, the central box is rectangular and is 9 cm long and 5 cm wide. It was retrieved off the coast of Qawra in 1967 (Cauchi 1967, 8) and is held in the reserve collection of the National Museum of Archaeology.

QALA 1961/M/1
This stock, currently on display at the Maritime Museum, was discovered off Qala in 1961 (Zammit 1961, 7; John Ripard *pers. comm.*) Deterioration of the lead has revealed hollow flukes demonstrating

that the anchor was cast around a wooden core that no longer survives. A raised patch on one of the arms may be a shell that was cast on to the lead. The stock is 1.83 m long. The central box is 23 cm long and 13 cm wide and is rectangular on the inside with rounded outer edges (Fig. 4j).

SPB 1963/M/2
This is an exceptionally large example. Measuring 4.28 m in length, it is the largest lead stock found anywhere in the world with an estimated weight of over one ton (Purpura 2003). It is hollow and transversal crossbars run the length of both arms. This indicates that it was made by casting lead around a wooden core, which would have been perforated to allow molten lead to seep through. This would cool to form strengthening and reinforcing lead bars through the wooden core along the length of both arms. The central box is 26 cm long and 59 cm wide. The cross bar is also hollow, suggesting that it too was made of lead cast on wood. This enormous stock was found off St. Paul's Bay in 1962 and raised in 1963 (Zammit 1963, 7, fig. 6) (fig. 3f) and it is now on display at the Maritime Museum.

Collars
In addition to the stocks some lead collars that were used to reinforce the attachment of the wooden arms to the central shaft have been discovered. All have three compartments indicative of two-armed anchors.

SPB 1963/M/1
This collar was found in 1963 at St Paul's Bay in the vicinity of the large anchor stock (SPB 1963/M/2) (Zammit 1963, 7). It is 84 cm long and a maximum of 18 cm wide and is currently on display at the Maritime Museum.

MFN/M/32539
This collar measures 83 cm in length and 8.8 cm in width. It was originally thought to have come from Marsalforn but may be the collar that was found with the stock at Ramla Bay in 1962 (George Azzopardi *pers. comm.*; *Times of Malta* 11th October 1962, 9) (Fig. 4k). It can be seen in the Gozo Museum of Archaeology.

UNP/M/ 503
This is a very small example, with a total length of 29 cm. Its provenance is uncertain but it may have been found in Zurrieq (Manuel Magro-Conti *pers. comm.*). It is in the reserve collection at the Maritime Museum.

Discussion

The above shows that the majority of known stocks are the Kapitän 3c or Haldane IIIB type. Furthermore, elements that Kapitän describes within the remit of one subtype are also found in others. For example, the rounded outer edges of Qala 1961/M/1 that he describes in his type 3d but which also appear in a type 4 stock.

An interesting feature of a stock with a lead cross-bar (SAL 1962/M/1) is that it also appears to have a significant wooden element. Deterioration of the lead has shown that it is at least partly hollow on the inside and has longitudinal partitions inside the arms. This could be the result of using organic material as filler for economical purposes (Haldane 1984, 29; Purpura 2003). Deterioration was evident in one longitudinal half of the arms and it is unknown if the other half is solid lead or is also hollow. Further investigation using non-destructive imaging techniques may yield interesting clues about lead stock manufacture.

In light of the above, a discussion about the weight of these stocks will be speculative to some degree. However, the MFN/M/32545 and Ghallis 1963/M/1 stocks were thought to weigh approximately 500 lbs (227 kg) on recovery (Zammit 1961, 7; Zerafa 1963, 7). They are large examples and are representative of the upper limits of the ones described here. Others including KEM 1996/M/1, UNP/M/NMA/7/1, UNP/M/505, UNP/M/508, WRD 2000/M/32543, UNP/M and SWL/1983/M/1 are of a comparable size while SAL1962/M/1 and SAL 2004/M/1 are slightly larger. A smaller stock, XLN/M/32546, was estimated to weigh approximately 150 lbs (68 kg) (Zammit 1961, 7). Similar sized ones include XLN/M/32542, XLN/M/32540, UNP/M/504, UNP/M/506, UNP/M/NMA/7/2 and UNP/M.

Distribution

The Maltese islands are indented with bays and harbours which offer protection from the prevailing northwesterly winds although in the winter some are exposed to northeasterly storms. However, a few areas

such as Marsa, Burmarrad, French creek and Mistra dc offer all-weather protection and would have been ideal for vessels wintering at the islands.

A distribution map of the anchor stocks (Fig. 2) shows that the majority were found in sheltered bays that may have been regularly used as anchorages. Others from Munxar reef, Delimara Point and Ras il-Wardija, were found just outside such spots. The lack of stocks from other bays should not be taken to imply a lack of maritime activity in these areas since all the stocks described here were chance finds not the results of systematic research. For example, well-sheltered harbours like Marsa and Grand harbour are still heavily used making research there difficult. Heavy sedimentation that has affected the islands' deep submerged valleys has also concealed archaeological material.

An interesting point is the location of the enormous stock found in St. Paul's Bay. Such large stocks are impractical to handle on board a vessel and instead may have been mooring points for marine installations (Purpura 2003). It would be interesting to investigate if any traces of such installations still exist in the area.

Conclusion

It has been suggested that a low incidence of ancient shipwrecks in Maltese waters reflects a low degree of maritime activity (Atauz 2008). The archaeological value of an anchor stock refutes this and not all visiting vessels would have lost an anchor. Neither have all anchors recovered by private individuals been reported to the authorities. It is possible to conclude that the pieces in the national collection are representative of a steady maritime flow in antiquity. Their distribution points to the use of these maritime spaces by ancient seafarers who called into Malta to trade, for shelter from adverse weather or simply to wait for the ideal wind to continue their journey.

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Revisiting the Roman *domus* in Rabat, Malta, through a consideration of its mosaic flooring

Antonio Caselli

Mosaics have a language of their own. Whether they exhibit figurative or geometric drawings, mosaics help to regulate the flow of movement within a building and often correspond to the function of rooms. Figurative mosaics were meant to be admired and discussed by the pater familias *and his guests, whilst geometric mosaics decorated passage areas that did not require waiting, such as corridors and service areas. Floor mosaics can offer valuable insights into the spatial organisation within a house. This paper considers the floor mosaics of the Roman* domus *in Rabat, Malta, and explores how their direction, decoration, and arrangement can help to gain a better understanding of the internal layout of the house.*

Mosaics from the Roman period in Malta have not been given the attention they truly deserve. Reasons for this may be related to the limited information related to their discovery and excavation. Throughout the years precious evidence and information about the structure of the *domus*, and especially its walls and the layout of the rooms have unfortunately and irremediably gone lost. The aim of this paper is to revisit the mosaics discovered in the Roman *domus* in Rabat (Malta), using a contextual approach in order to attempt an imaginary reconstruction of the layout of the *domus* and relate these "paintings in stone" to the possible function of the rooms uncovered by A. A. Caruana during his excavations in 1881 (Caselli 2002).

Following the first appearance of mosaic floors in the Greek world in the eighth century BC, it is only in the Hellenistic period and subsequently in Roman times that mosaics began to be considered as proper works of art just as painting and sculpture were (Ling 1998, 53). However, to be fully appreciated and understood mosaics have to be experienced within their original architectural and cultural context. They then acquire the power to convey messages to the viewer through geometric symbols and complex figurative designs. Therefore, it becomes necessary to visualise how these floors were perceived in ancient times, how a certain decoration was associated with the principal use of a particular room, and how this helped viewers, be they occupiers or guests, to find their orientation within a house.

Reading the layout of a Roman house

It is important at this stage to understand the ideal layout of a Roman *domus* – a house belonging to members of the upper class of the Republican and Imperial periods. The first-century BC Roman architect Vitruvius provides such a description in his treatise *De Architectura,* which gives an idealised and rather rigid description of Roman architecture (Vitruvius 6; Granger 1934). Vitruvius emphasises the role of the architect and hence portrays the Roman house as a building made to plan consisting of a set of rooms whose size, position, and function are clearly defined, reflecting the norms of Roman society. Inevitably such a normative description does not allow for functional and structural change, while the lived reality has to respond to inevitable architectural changes to which most of the houses of his time were subjected. In fact, the evidence from Pompeii shows that houses underwent frequent modifications: rebuilding, demolition, and addition of rooms, so that often old floors coexisted with new ones (Dunbabin 1999, 306). At the same time, however, archaeological

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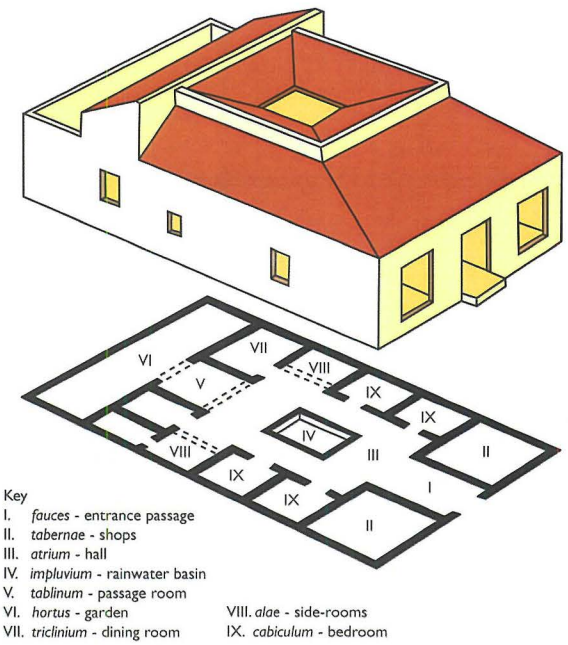

Figure 1. The typical Roman *domus* reconstructed in plan and oblique view (drawn by Maxine Anastasi).

evidence from Pompeii, Herculaneum, and Ostia suggests that most of the private buildings uncovered there do follow Vitruvian principles in their layout having a *fauces* (entrance), an *atrium* (main hall), a *tablinum* (reception hall/office), a *peristyle* (colonnaded courtyard), a *triclinium* (dining room), and several *cubicula* (bedrooms) (Fig. 1). Indeed, the first-century AD domestic architecture of Pompeii suggests that although preference was for an axial layout of rooms arranged in a sequential order (*fauces* – *atrium* – *tablinum*) as suggested by Vitruvius, this was not often the case since in practice the architect had to face several problems (Clarke 1991, 14). To obtain the *fauces* – *tablinum* axial alignment, architects had to deal with space restrictions, modifications, and new additions to the house, often coming up with new interesting solutions and compromises.

The original concept of having such a disposition of rooms was to make the person entering the house experience its extent to the fullest. This was achieved by having a complete view of the house from its *fauces* up to the *tablinum* at its far end, looking through the *atrium* (Clarke 1991, 75). It therefore becomes necessary to understand the layout of the Roman *domus* and how this was perceived by the patron and his guests. This can only be achieved and understood by considering the characteristics of Roman society. According to Wallace-Hadrill, 'social historians will want to know how the architect and decorator enabled the house-owner to articulate his social space along the *atrium* – *tablinum* axis [...] Once we can learn to recognise and read the language of differentiation, we will then be in a better position to comment on its social diffusion' (Wallace-Hadrill 1997, 58).

There seems to be consensus among scholars that the architecture of the Roman *domus* fitted the needs of a life centred on strong social rituals, while also satisfying the physical needs of the Roman citizen. The *domus* was the centre around which the public and private lives of the citizen rotated and interacted. It was perceived as a "private temple" where rituals, rites of passage, social, and daily events of human existence took place (Wallace-Hadrill 1997, 58). The *domus* became a physical embodiment of Roman culture and a means of displaying the large collection of symbolic manifestations that characterised the life of the ancient Roman (Wallace-Hadrill 1997, 58; Clarke 1991, 10). The presence of guests in the house became a pretext for the owner to transform the *domus* into a place to show off his wealth and state his importance in society. It was, as Wallace-Hadrill (1997, 55) has put it, 'a power-house [...] where the network of social contacts was generated and activated the underpinning for his public activities outside the house'.

To achieve this, the house was purposely planned to emphasise the status of the owner during the *salutatio*, a daily ritual that required visitors to pay homage to the *pater familas* to reinforce his social status and cultivate his economic position (Clarke 1991). A person passing through the *fauces* from the outside world entered into the microcosm of the Roman house. From here the visitor was able to see the inner depths of the domestic setting while certain parts of the house would still remain secluded from his eyes at the discretion of the owner. The latter decided which parts of the house would be accessible or out of reach for visitors. It was in the *atrium* that the person was received and then led into the *tablinum* to perform his *salutatio* (Clarke 1991, 4).

In the task of walking along the axial line running from the *fauces* to the *tablinum* the visitor was aided by architectural elements (columns and walls), lighting, and decoration (wall paintings and floor mosaics) in distinguishing accessible public areas from inaccessible private ones. In this ritualised practice, mosaic pavements played an important

role in guiding the visitor through the different environments within the *domus*.

Mosaics and room functions

Mosaics can help to identify the rituals or practices associated with specific rooms of a Roman *domus*. However, the choice of mosaic design, size, and shape were entirely subordinate to architecture, since these characteristics were respectively dictated by the size and function of the room to be covered. Only the most important rooms displayed figurative designs, like the "drinking doves", in the peristyle, whilst minor rooms had geometric designs, or consisted simply of beaten earth floors (Dunbabin 1999, 305). The patron therefore decorated such rooms with the best mosaics in order to flaunt his wealth and inspire a conversation with his guests through the themes represented.

The rooms placed along the *fauces* – *tablinum* axis were the most important ones from the perspective of the visitor. It was in the *tablinum* that the relationship between the patron and his client was emphasised, creating a more intimate relationship. The *cubiculum* was the private room *par excellence*, where no one, except members of the family, was allowed to enter. Its function varied from serving mainly as a bedroom or a private study where to relax, contemplating wall paintings and mosaics. In this room, as in the *triclinium*, the mosaic also marked the disposition of furniture and acted as a partition between different areas within the *cubiculum* itself. As Ling (1998, 116) has argued, 'The choice of floral and geometric motifs was dictated by the fact that these offered multiple viewpoints, which could be infinitely repeated and above all offered no opportunity to the viewer to stop to contemplate and so obstruct the passageway, as happened with figure mosaics'. Hence, geometric mosaics provided an implicit meaning of movement and fluidity which unconsciously "pushed" the person towards another room. On the other hand, figure mosaics imposed a single point of view and demanded contemplation. Such mosaics were therefore employed in rooms which were highly frequented by people.

The introduction of the Greek-type paved *peristyle* in Roman architecture was the outcome of contacts between Rome and the east during the second century BC. This new addition to the *domus* started as a fashion in appreciation of Greek culture. The paved *peristyle* would be transformed by the Romans into an attractive and secluded garden (Clarke 1991, 12). Evidence from Pompeii has shown that numerous houses were modified by Greek and Roman architects in order to incorporate this new foreign element without changing the original axial scheme. Modifications were thus made to accommodate the *peristyle* behind the *tablinum*, elongating the axial view (Clarke 1991, 12). However, whereas in Hellenistic Greece the peristyle was the "heart" of the house, placed as it was in the centre enjoying a commanding view of surrounding rooms, the Roman *peristyle* remained essentially foreign since it was secluded at the back of the house, outside the public sphere of social events which took place instead in the *atrium* (Dickmann 1997, 123). In a Roman context the Greek *peristyle*, characterised by a floor mosaic, was transformed into a garden, with fountains and small shrines. Its real use often depended on the taste of the owner of the house. In some cases it served as an *ambulatio*, a space used for walking or discussion with friends, often after a meal. In other cases, guests were guided through the *atrium* and *tablinum* to be received in the *peristyle* which was transformed into a proper reception area.

The *Domus* in Rabat as a case study

The Roman *domus* discovered in Rabat by A. A. Caruana in February 1881 (Caruana 1881), just outside the city walls of Mdina, is a fine example of a first-century BC architectural compromise between late Hellenistic and Pompeian styles, a building that is still the finest example of Roman domestic architecture ever discovered in Malta. The two excavation campaigns which took place in 1881 and 1925 respectively uncovered what must have been the entire extent of the *domus* (Fig. 2). Although no walls were preserved except for a few stone courses limited to some areas, a number of the richly decorated floors of the house survived. These allow us a glimpse into how the original building must have looked in its heyday. Moreover, the discovery of exceptionally well-crafted sculptures, portraying members of the Julio-Claudian imperial family, datable to the first century AD, suggests that the owner of the house was of high social standing (Bonanno 1992, 23-24).

Understanding the Rabat *domus* depends on a grasp of its life-history. Determining the phasing of the overall construction is an extremely difficult process,

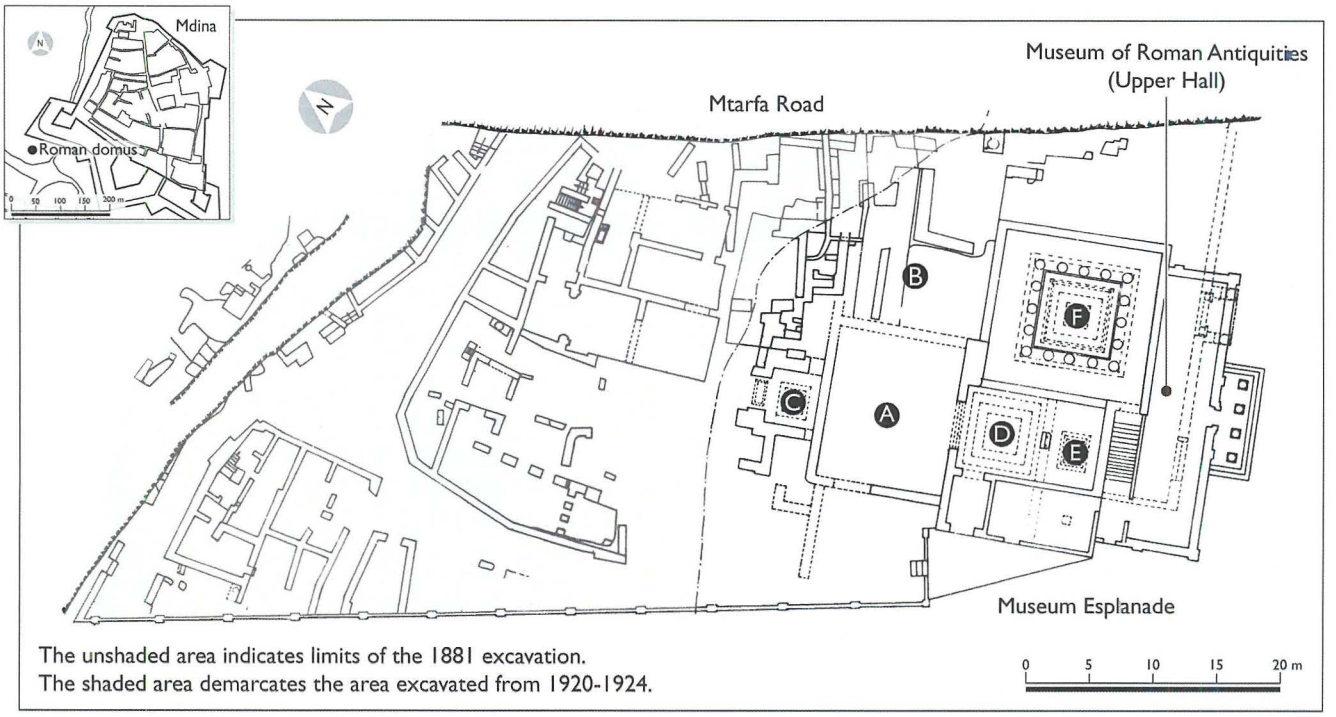

Figure 2. A plan of the remains uncovered in Rabat during excavation campaigns carried out in 1881 and 1920-1924 respectively (redrawn after Gouder 1983 by Maxine Anastasi).

since one must take into consideration all the changes which bring structural modifications to a house. Accessibility, the function of rooms, the perception of space, and the orientation of the building are all problems related to the different building phases of the house. Reconstructing the original aspect of the Rabat *domus* and identifying with certainty the function of each room would be an impossible task, since vital information, which could have been provided by a meticulous recording of the archaeological layers over the site, is simply not available (cf. Bonanno 1992, 24).

While we have to accept the limitations of the archaeological remains, an alternative approach based on the surviving original mosaic floors should be explored. In view of what has been said above, the assessment of the floor layout, especially its orientation and decoration, can shed light on the spatial organisation of the *domus* and hence allow us to understand the function of the rooms.

At first glance, the layout of the Rabat *domus* seems to have developed haphazardly without any pre-planning. Rooms seem to have no apparent orientation and their offset position in respect to the *peristyle* (room F) can hardly be explained (Fig. 2). Even more confusion is created by what look like substantial structural changes, which at a certain point must have changed the overall aspect of the *domus* and completely revolutionised the function of its interior rooms. Ample evidence of such works can be seen in room A and room B, where the mosaic floors, for as yet unknown reasons, were raised by about 30 cm. Traces of a second mosaic bedding can still be seen in the south-east corner of room A, lying over a previous one of similar manufacture (Fig. 3), while another room (C) was dug into the bedrock up to a depth of 1.5 m below the level of the adjacent room (A). It is very likely that after the house was abandoned towards the end of the second century AD, great parts of the mosaic bedding in rooms B and A were hacked through to reach the bedrock layer for supplying slabs for the Islamic cemetery almost a millennium later. Unfortunately, this quarrying

Figure 3. Successive bedding layers for floors inside room A (possibly the atrium) (photograph by Antonio Caselli).

destroyed any link which might have existed between this part of the house and the neighbourhood which developed to the north of the *domus*, the side facing Mtarfa Hill.

Surviving tracts of walls and thresholds, together with the orientation of the mosaics, allow us to understand the layout of the house and determine the function of different rooms. Galizia, the architect who had surveyed the remains of the *domus* in 1881, had already used the orientation of the "drinking doves" *emblema* in the peristyle to argue that the porch found along the east wall could not have been the original entrance because the doves gave their back to that entrance (Caruana 1881, 5). But no attempt was made to extend this line of reasoning to the rest of the rooms. A closer look at the surviving foundations of the *domus* shows that the thresholds and the design and orientation of the mosaic floors create a pattern of axial views which meet at room A (Figs 4, 5). In this room a visitor standing on threshold 1 would have been able to see into room B through its presumed door opening (threshold 2) and the *peristyle* (room F) through the door openings indicated by thresholds 3 and 4. Therefore, when approaching room A, a person would have got a commanding view over the two largest spaces of the house, a situation not dissimilar to the *atria* of numerous houses of Pompeian style. Hence, by comparison room A can be considered to have served an important function, comparable to the *atrium*. If this interpretation is correct, the adjacent space X could have served as a corridor or *fauces* linking the *atrium* to the nearby road, recognisable by a pair of cart ruts. Keeping in mind the axial alignment of the Pompeian houses where the *atrium*

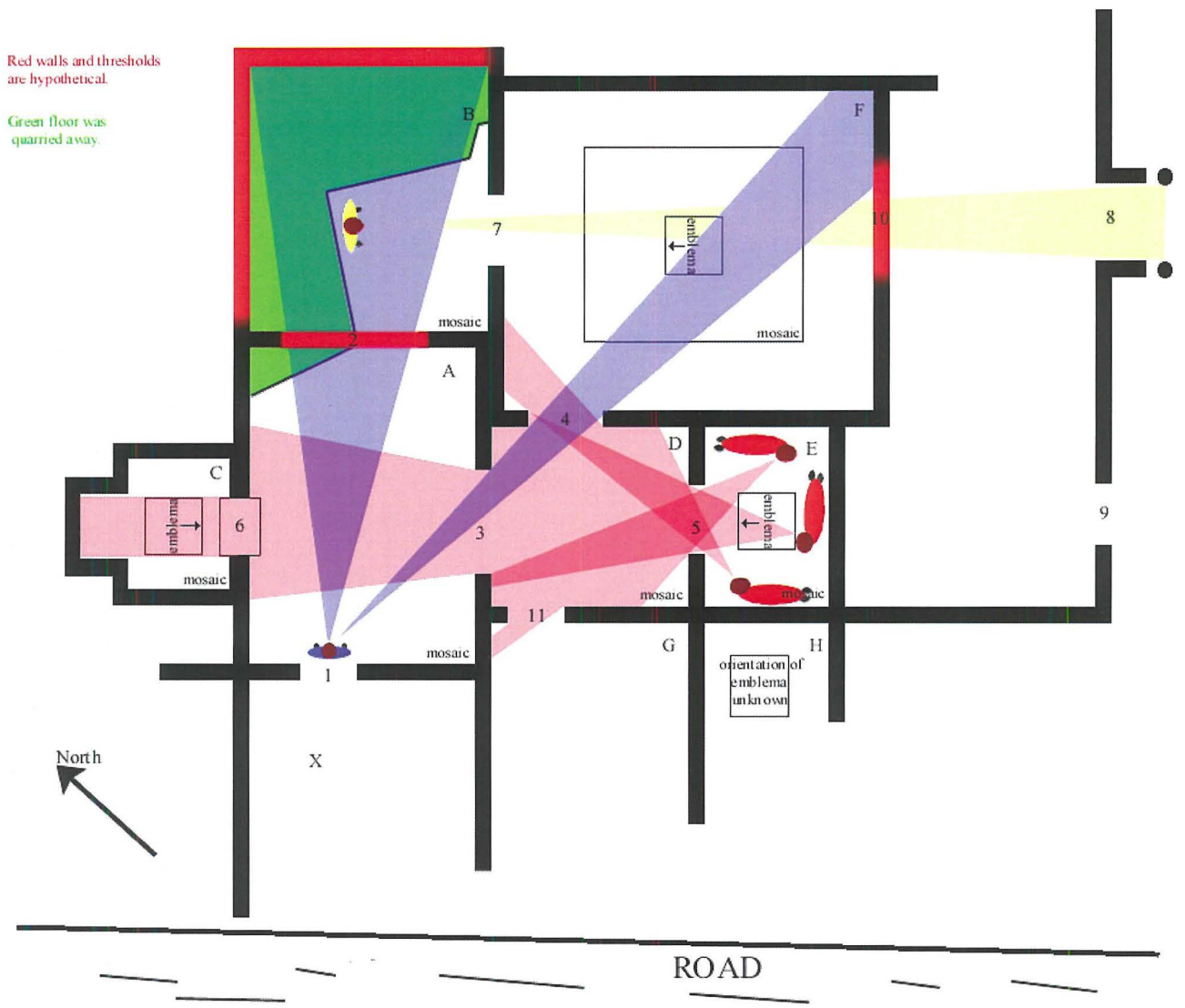

Figure 4. Plan of the Roman *domus* in Rabat with the representation of the main axial views (drawn by Antonio Caselli).

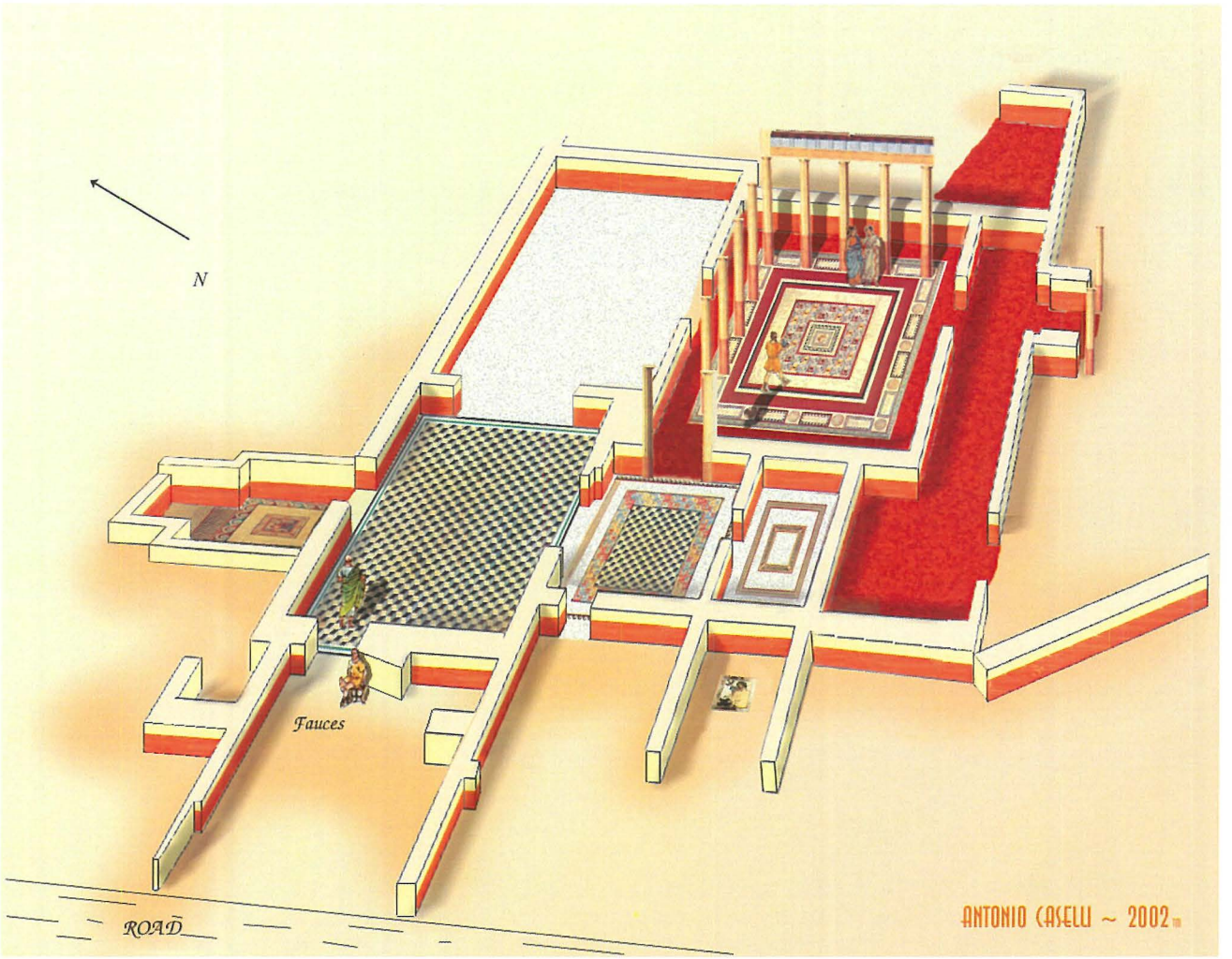

Figure 5. Reconstruction of the Roman *domus* in Rabat, first century BC (drawn by Antonio Caselli).

was followed by the *tablinum*, we could hypothetically assign a *tablinum* function to room B, although there are no other indications to confirm this, other than the existence of the thresholds.

The area being here proposed as the *atrium* of the Roman *domus* is covered by scanty remains of *opus scutulatum*, lozenges of different marble or stone and/or colour arranged in a pattern to produce the illusion of cascading or receding cubes. The presence of this type of flooring is confirmed by Gouder (1983, [10-11]) who reported a fragment of it from this room. This type of floor became very fashionable during the Late Hellenistic period among Greek and Roman cultures since it provided an abstract design which did not impose a forced point of view as *emblemata* did. One reason why the owner might have opted to cover the *atrium* with a geometric pattern rather than a figure mosaic might be suggested by the fact that the *atrium* was seen as a transition area, a dynamic space rather than a static one, which "pushed" the viewer towards more important rooms of the house.

The axial view may have continued even further beyond the *peristyle* through a hypothetical door (threshold 10), today missing. This is suggested by threshold 8 which is aligned with threshold 7.

Beyond the area being proposed as a *tablinum* was the *peristyle*. Its location is somewhat unusual as it is situated on the southern side of the *tablinum* and therefore outside the much sought visual axis described by Vitruvius (6.II.1; Granger 1934). No particular reason can be given for this, other than that this solution was seen as the most viable if the architect had space constraints or had to fit the *peristyle* as a later addition to the *domus*. However, the architectural arrangement of the *peristyle* still maintained the axial view by allowing anyone standing on threshold 1 to be able to see the central part of the *peristyle* through doors 3 and 4. The decoration of the peristyle floor

is characterised by a tessellated mosaic pavement with a colourful three-dimensional meander pattern, which frames a central *emblema* depicting a version of the famous "drinking doves" of Sosos of Pergamon, copies of which have been found in Greece, Pompeii, Sicily, and elsewhere. The *emblema* is oriented towards the north, facing threshold 7, thus indicating that the *peristyle* was very probably accessed from room B. A hypothetical guest would have entered the house from the *fauces* X, crossed the *atrium* A and performed the *salutatio* ritual in the *tablinum* B. If the person in question was an important figure or a friend there is a high probability that he was led to the more secluded *peristyle*, the "heart" of the private area of the house. In Pompeian houses this space became a walled garden, however in our case the *peristyle* was decorated with a mosaic floor, a characteristic of most Hellenistic houses.

Another interesting room which could have served a similar purpose is room C. This room was created by excavating a 5 x 5 m trench in bedrock on the northern side of room A. At the back of the room, a niche wide enough to accommodate a couch was also created. The room was then covered with a polychrome tessellated floor showing an unusual three-dimensional scroll pattern, framing a central *opus vermiculatum* depicting what is thought to be a scene of a *satyr* and two *maenads* (cf. Bonanno 1992, 21). A mosaic strip separated the polychrome floor and the rest, possibly a geometric mosaic known as *scendiletto* (similar to today's carpets placed next to a bed) that separates the space allocated to the bed from the rest of the room. The difference in height between this and the nearby floor levels is, however, too large to be explained as a result of structural alterations and reconstructions. Although the shape and flooring of this room recall Roman *cubicula* (cf. Clarke 1991, 12, 28), the rich floor decoration of the room and the presence of an axial alignment existing between thresholds 6, 3, and 5, seem to suggest that it rather served a more public function. Several uses could be assigned to a room with these characteristics: a study (*diaeta*) where clients were received for business purposes; an *ala* or waiting room; or a *museion*, a place where wall paintings, statues, family portraits, and mosaics were displayed in a sort of art gallery which was enjoyed by the owner and displayed proudly to his visitors. Whatever its function, the mosaic seems to depict a ritual that can be tentatively associated with Dionysus. Further comparative research on the matter is needed.

Room D is another large room connected to room A through a large threshold, 3 (Figs 4, 5). Its flooring in *opus scutulatum* is still well preserved and it must have acted as a visual connection with room A, decorated with the same box pattern.

Concluding remarks

It has to be accepted that the approach presented here can only offer preliminary results since the archaeological evidence would not support more. Based on a careful assessment of floor mosaics and door openings, the method allows a reconstruction of potential movement patterns and room functions. By comparing the idealised normative Roman *domus* as described by Vitruvius to the spatial sequences suggested by the floor mosaics and rooms in Rabat, a new understanding of the Rabat *domus* can be proposed, bringing the *domus* closer to the high-status Hellenistic/Roman house known from Pompeii and other centres of Roman culture.

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The known unknown:
identification, provenancing, and relocation of pieces of decorative architecture from Roman public buildings and other private structures in Malta

David Cardona

In archaeology a narrative or story is usually reconstructed on the basis of a meticulous study of material. In normal circumstances, the physical material constitutes the known, while the actual story remains the unknown until the material is deciphered and put in context. When it comes to certain aspects of Roman architecture in Malta, and especially the architecture of public buildings, the story is somewhat reversed. This is because we know of the presence of public buildings but the actual physical evidence of such structures has for long remained unknown. This study seeks to provide a story, one that gives a provenance to some of the most important architectural elements found in various local collections, thereby bringing to the attention of researchers a corpus of data that has hitherto been little known.

The architectural decoration of the Maltese Islands during the Roman period has been considerably overlooked by most scholars. However, as shown in a recent unpublished study, several local collections hold more than 376 fragments which can say a lot on the evolution of architectural decoration in Malta during the Roman occupation (Cardona 2010). Unfortunately, the nature of past documentation, the lack of proper legislation, and the uncontrolled movement of fragments within collections have led to the loss of provenance of numerous fragments. Most importantly, this has led to the obliteration of evidence of Roman public buildings in the main city, of which no clear physical evidence survives. Epigraphic evidence allows the identification of public buildings which are, however, still relatively unknown as no physical remains could so far be precisely connected with these structures. The possible connection of some of these architectural elements with public buildings would thus be of significant importance to the archaeology of Roman Malta.

On the other hand, private buildings are well known from the archaeological remains uncovered and recorded in the last century or so. However, the same problems of documentation and legal protection have also meant the loss of some valuable information and fragments. An example of such a loss is that of the telamon found at the seaside villa of Ir-Ramla l-Ħamra, Gozo, (Ashby 1915, 72), the whereabouts of which have long been unknown.

Roman public buildings: what do we know?

We can assume that like any other Roman settlement in the Mediterranean, Malta would have had its share of public buildings. Epigraphic and other written evidence, in fact, prove that this was so. The first evidence comes through the writings of Cicero whose oration against Verres in 70 BC mentions the plundering of the temple of Juno (Astarte) by Verres. In his speech, Cicero remarks that this temple was internationally renowned and revered by pirates and Numidian princes (Verr. II.4.46, 103, 47, 104; Greenwood 1928). This temple has been identified with the remains at Tas-Silġ, excavated by the Missione Archeologica Italiana and, more recently, by the University of Malta. Materials resulting from the excavations carried out by the two institutions are being studied and will be published shortly (Cardona forthcoming; Bonzano 2007). They will not therefore be dealt with in this paper.

The earliest epigraphic evidence for a public building comes through the so-called Chrestion inscription that has been dated by Abela (1647, 207) and Bonanno (2005, 204) to the Augustan period.

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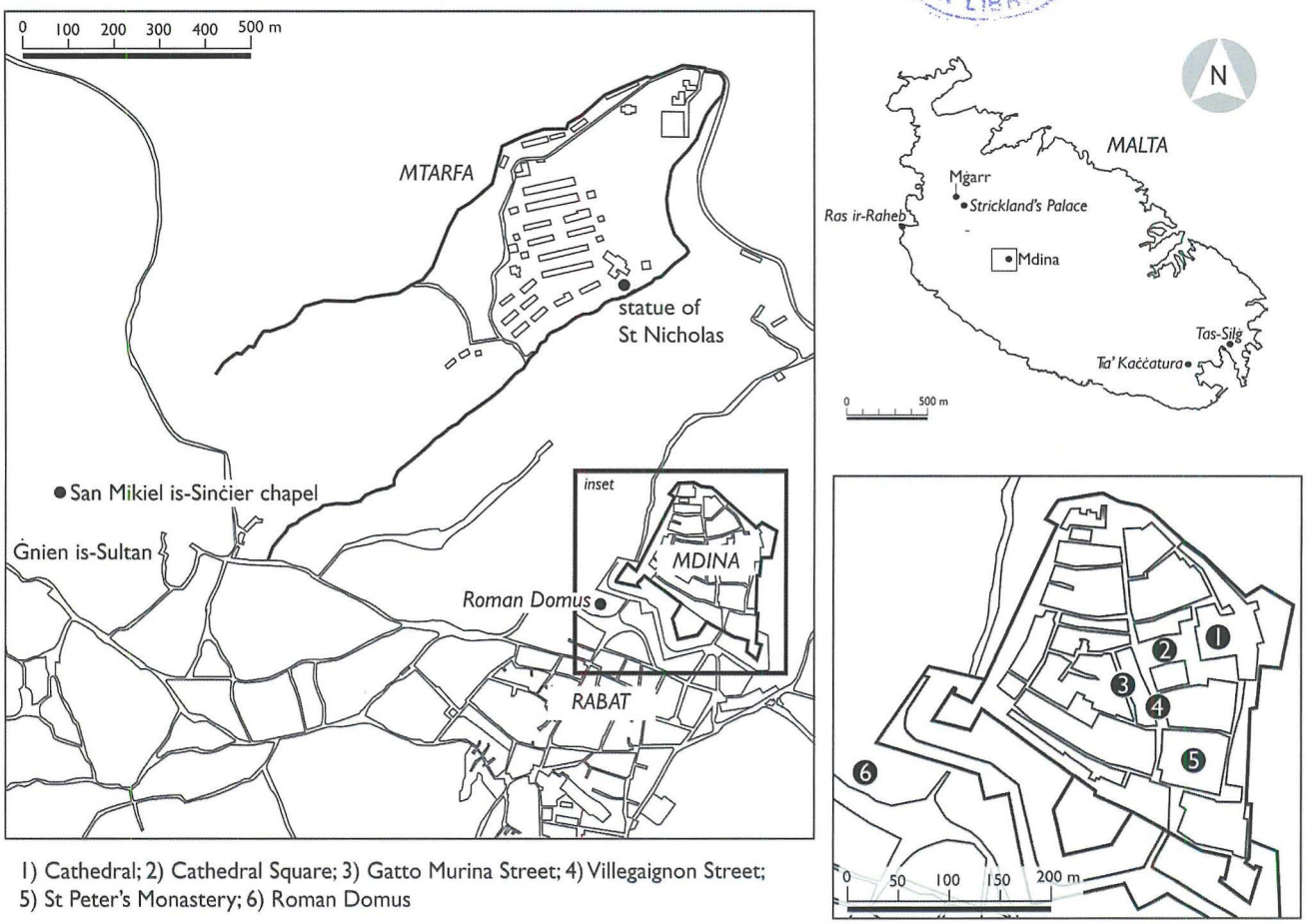

Figure 1. Location plan of the major sites mentioned in the text (drawn by David Cardona, digitised by Maxine Anastasi).

Found in 1613 on Mtarfa Hill (Abela 1647, 207-9), it records the restoration of the temple of Proserpina by Chrestion, freedman of Augustus and procurator of the Maltese Islands (CIL X, 7494; Bres 1816, 226-7; Caruana 1882, 88; Ashby 1915, 229; Bonanno 1992, 16) (Fig. 1). Another public building is mentioned in a second-century AD inscription found in 1747 close to St Peter's Benedictine monastery in Mdina. This inscription records the construction of a temple dedicated to Apollo and the payment of parts of it by a private benefactor, namely the podium, floor, four columns of the front portico, and the flanking pilasters (CIL X, 7495; Ciantar 1772, 131; Caruana 1881, 10; 1882, 89; Ashby 1915, 30; Bonanno 1992, 16). Another inscription, found next to the same monastery in 1868, records the construction of a marble temple with its cult statue and all of its decoration by a certain Claudius Iustus, patron of the municipality (CIL X, 8318; Caruana 1881, 11; Bonanno 2005, 206). Although the name of the deity to whom this temple was dedicated is missing, the close proximity of its discovery to the 1747 inscription, as well as the similar title given to the patron led Albert Mayr to believe that the two inscriptions actually commemorated the same building but it will never be possible to confirm this as both have been permanently removed from their original location (cf. Ashby 1915, 31-2).

Roman public buildings: what do we have?

We have seen what evidence we have for the presence of public buildings in Roman Malta but what has actually survived of these structures? Up until recently it has always been believed that nothing exists of these public buildings apart from the remains at Tas-Silġ and possibly those at Ras ir-Raħeb (tentatively identified with the remains of the temple of Hercules given coordinates in Ptolemy's *Geography*; cf. Vella 2002) (Fig. 1). A considerable amount of information can however be gathered from scholars writing in the course of the seventeenth century and later. In 1647, for instance, Abela records that 'Indi per tutte le strade di essa [Mdina] si vedono colonne di marmo, altre

Figure 2. Photograph of the statute of St Nicholas in Mtarfa with Mdina in the background (photograph by David Cardona).

intere, altre in pezzi, cornicioni, piedestalli, e capitelli, e altri vestigie di fabriche antiche [...]' (Abela 1647, 32). We can thus conclude that in the seventeenth century the streets of Mdina, and especially the cathedral square, were littered with fragments of marble and other architectural pieces. Abela is also the first historian to place the temple of Proserpina on Mtarfa Hill, where he places several cornices. More architectural fragments from this temple were seen by Abela next to the church of San Mikiel is-Sinċier at Ġnien is-Sultan outside Rabat (Abela 1647, 209).

Another important scholar is A.A. Caruana who wrote in the closing decades of the nineteenth century. His reports are a treasure trove of information on the remains of possible public buildings found during the course of the eighteenth and nineteenth centuries. Among the most notable of the finds he mentions various fragments uncovered next to the Benedictine monastery in Mdina and during the construction of nearby Casa Azzopardi. This material includes several marble capitals, ornaments, and other large marble slabs (Caruana 1881, 10-11; 1882, 89). Caruana also joins Abela in placing the temple of Proserpina at Mtarfa. He actually goes further by locating the temple on the spot of the present statue of St Nicholas (Fig. 2). However, he also writes that when he inspected the site he found nothing but holes dug in the floor (Caruana 1882, 88).

The documentation left to us by these two scholars alone provides enough evidence to place substantial remains of a Roman public building in the vicinity of the Benedictine monastery located on Villegaignon Street in Mdina. The question to ask is what happened to the numerous fragments mentioned by Caruana and Abela, and especially the fragments scattered along the streets of Mdina? Some of the answers to this question can be gleaned from Caruana's own writings.

The discovery of the Apollo and Iustus inscriptions and the archaeological material discovered with and around them happened in an age in which no laws existed for the safeguarding of cultural heritage. Consequently, there was no control over what happened to archaeological material. In fact, Caruana (1881, 10-11; 1882, 89; 1899, 282) clearly states that the remains that were found on the Apollo site in 1710 and 1747 were eventually scattered among private collectors. Among these, Caruana mentions

three Corinthian capitals that ended up in the Sant Fournier collection (Caruana 1882, 89).Two marble pillars found during the digging of foundations for Casa Azzopardi were sawn off and used within the construction of the same house. The remaining marble blocks were used for the altar tables of the chapels of the Blessed Sacrament and the Crucifix in the Mdina Cathedral, St Paul's Grotto, and the thresholds of the churches of the Holy Souls and the Franciscans in Valletta (Ciantar 1772, 130-5, Caruana 1881, 11). Moreover, some of the marble remains visible in Mtarfa were apparently used for the coat-of-arms installed by Grand Master Carafa above the main entrance to Auberge d'Italie in 1683 (Bres1816, 351; Caruana 1881, 10; 1882, 88; 1899, 281), and at least some of the marble adorning the entrance of the Castellania in Valletta seems to have been taken from the same remains (Caruana 1882, 88). One particular column was transferred to Villa Sant in Ħal Lija to build a trophy (Caruana 1899, 282). In fact, it still stands in the garden of the same house (now Villa Ajkla), complete with an inscription commemorating its transfer from the Cathedral Square in 1852 (Fig. 3).

Most importantly, Caruana also mentions the transfer of six marble architectural fragments from the streets of Mdina to the then newly built Museum

Figure 3. Photograph of the cabled column transferred to V lla Lija, now Villa Ajkla (photograph by David Cardona).

Cardona cat. no.	Description	Current Location	Page reference to Cardona (2010)
F64	Decorated attic base	National collection, HM	576-7
F307	Attic base with no plinth	St Peter's Monastery, Mdina	578
F370	Plain attic base	Howard Garden column and cross, Rabat	579-80
F143-4	Fluted shaft	National collection, HM	581-4
F146	Fluted shaft	Palazzo Falson, Mdina	585
F147	Fluted shaft	Villegaignon Street, Mdina	586
F148	Plain shaft	Għeriexem spring, Rabat	587
F306	Cabled shaft	St Peter's Monastery, Mdina	589
F325	Fluted shaft	Private collection, Rabat	661-3
F328	Fluted shaft	Shop – Inguanez Street, Mdina	591
F362	Roped shaft	Villa Ajkla - Ħal Lija	592-3
F190	Fluted shaft	St Agatha's Museum, Rabat	588
F26	Corinthian capital	National collection, HM	594-5
F71	Ledged capital	National collection, HM	596-7
F72	Ledged capital	National collection, HM	598-601
F73	Corinthian capital	National collection, HM	602-3
F1	Marble entablature	National collection, HM	604-6
F2	Marble entablature	National collection, HM	607-10
F57	Marble entablature and soffit	National collection, HM	611-4
F58	Marble corona	National collection, HM	615-6
F82	Marble cornice	National collection, HM	617-8

Table 1. A list of architectural fragments that may have originated from Roman Melite (HM stands for Heritage Malta).

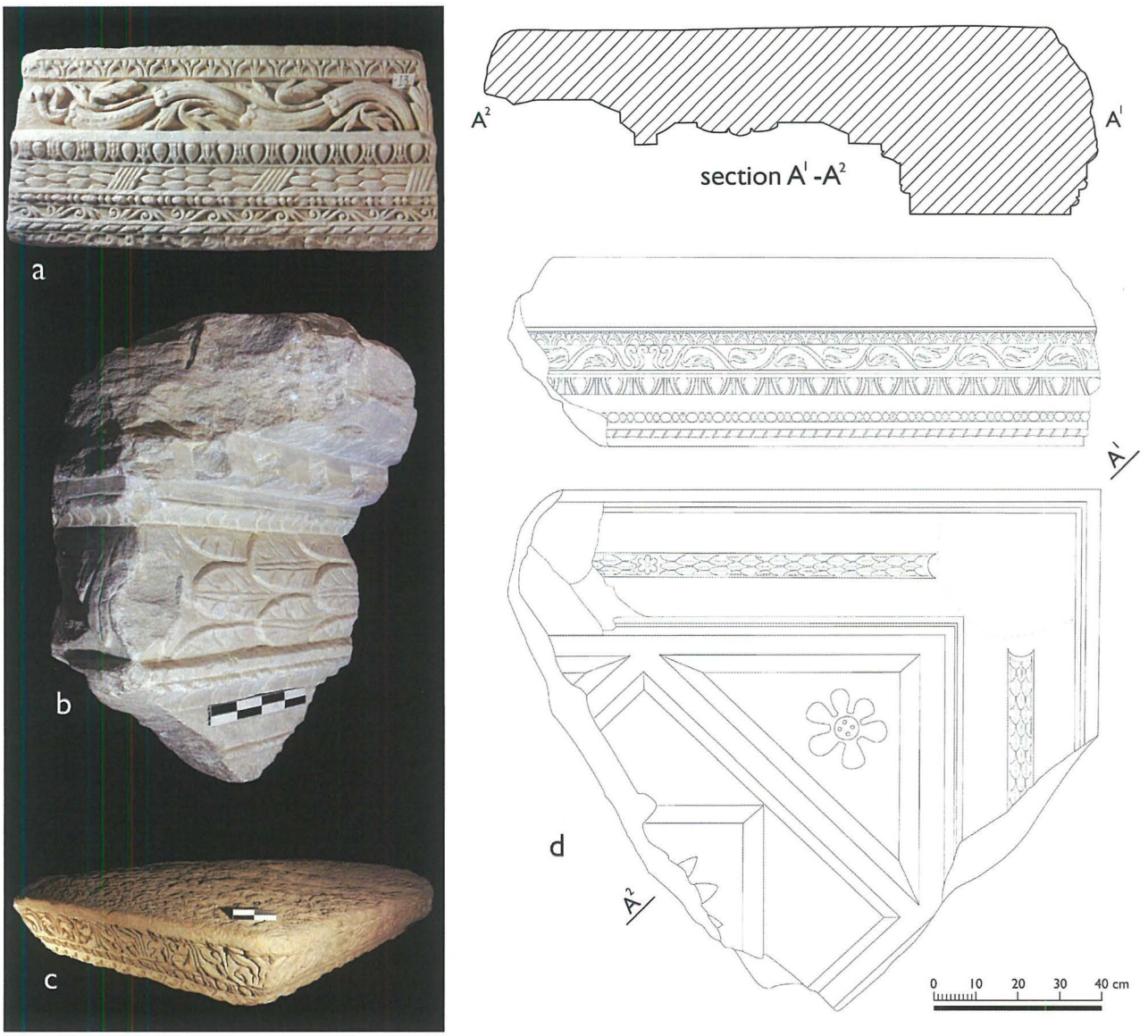

Figure 4. (a) marble architrave and frieze F2; (b) corner marble entablature F1; (c) marble corona F58; (d) archaeological drawing of marble entablature and soffit F57 (photographs and drawings by David Cardona).

of Roman Antiquities in Rabat (Caruana 1899, 281). The descriptions given for these six items are either very short or non-existent, but it is still possible to identify four of these fragments with pieces that are in the National collection of Heritage Malta. These include a Corinthian architrave F2 (Fig. 4a), an architrave decorated with foliage and pearls F1 (Fig. 4b), the corner of a marble corona F58 (Fig. 4c), and a marble soffit and entablature F57 (Fig. 4d) (Table 1).

The location of these fragments within the streets of the old capital also receives confirmation through some visual documentation. First among these is Abela's historical account which is accompanied by drawings showing a couple of fragments of which at least one (Abela 1647, 220) can be identified as F2. By way of comparison, the lithographs of Houël who visited the archipelago between 1776-9 provide more information. Among the most instructive of these lithographs is his plate 261.1 that shows the architrave and cornice fragment F2 (Fig. 4a) and corona F58 (Fig. 4c) placed on top of each other. F2 is, however, shown as a corner, whereas the surviving piece is not. Moreover, the decoration is shown running in the opposite direction from that of the surviving fragment. On the other hand, in the original sketch now held at the Hermitage (Pecoriano 1989, 338-9) the decorative scheme is exactly the same as seen on the actual fragment. The mirror effect might therefore

Figure 5. (a) decorated Attic base F64; (b) dentilled cornice F82; (c) ledged Corinthian capital F71; (d) pediment fragment F325 with the base of an acroterion carved out of the same block (photographs by David Cardona).

be due to artistic licence that Houël took so that his piece would fit into the final configuration of the lithograph. A second drawing (plate 261.2) shows three fragments identifiable with base F64 (Fig. 5a), ledged capital F71 (Fig. 5c), and capital F73 (Fig. 6). These last two capitals are also shown in two of his unpublished sketches (Pecoriano 1989, 239-40 and 254). A third sketch (Pecoriano 1989, 604-6) shows yet another architectural fragment, identifiable with the now broken piece, F1 (Fig. 4b).

More visual evidence of the architectural fragments that lay in the streets of Mdina comes from a watercolour and a drawing by Michele Bellanti (1807-1883). The two drawings show different angles of Gatto Murina Street (Fig. 1) in front of the Palazzo bearing the same name (figs 7a, b). Interestingly, Bellanti also includes five architectural fragments lying along the sides of the road. Of these, three can be identified with capital F73 (Fig. 6), cornice F82 (Fig. 5b) and corona F58 (Fig. 4c) (Table 1).

All this evidence seems to point out that the area of Mdina between Palazzo Gatto Murina and the Benedictine monastery once held substantial Roman structures, as recent excavations seem to confirm (Bonanno 2005, 161, 217). Moreover, although the exact identification of Casa Azzopardi is still elusive, it is highly possible that this house was later incorporated within the present Casa Inguanez, which seems to

Figure 6. Corinthian capital F73 (photograph by David Cardona).

have been enlarged by integrating three separate houses, and which seems to have the entrance located towards the back of Bellanti's streetscape.

Written records show that some marble fragments were shipped to the Maltese islands in the sixteenth century (Freller 1997, 45, 111; 2004, 88) thus casting doubts on the local origin of such elements. However, it is highly improbable that someone would acquire such large and heavy marble elements, transport them to Mdina, only to leave them along its streets. It is thus more likely that these fragments originally formed part of structures present in the Roman city of Melite. The problem still remains that the surviving architectural elements cannot be attributed to any of the temples mentioned in the inscriptions found. Given that most elements are carved in marble it is fairly plausible to think that they formed part of public buildings. Moreover, three of the elements mentioned above (F2, F57, and F58) have the same decorative scheme, which suggests that they originally formed part of the same structure.

If one follows the same reasoning that the materials found in Mdina most probably originated from ancient structures in the same city, it would then be possible to increase the number of known pieces by another 12 (Table 1). To these must be added a relatively unknown marble fragment (F325)

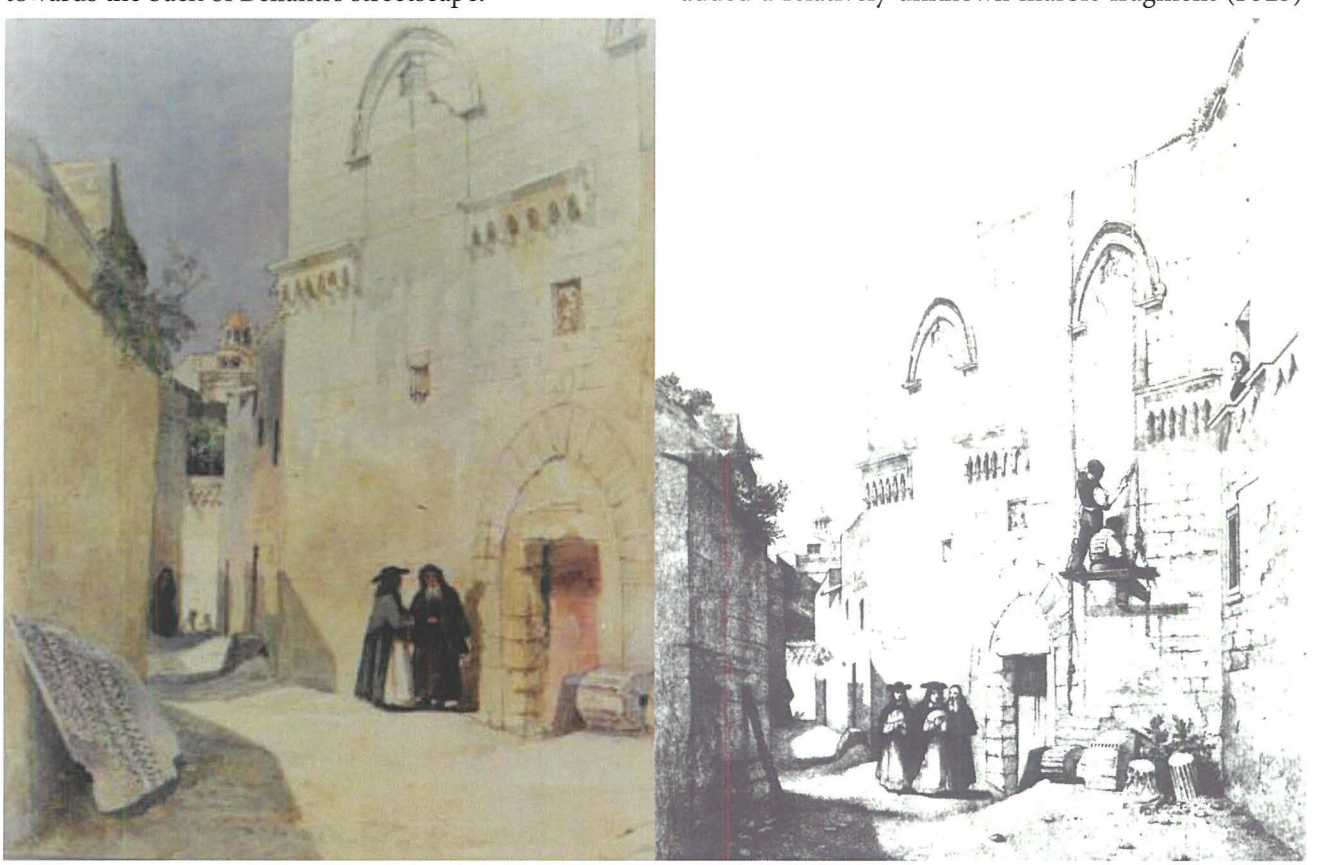

Figure 7. A watercolour and a drawing by Bellanti showing various architectural fragments lying in Gatto Murina street (reproduced by courtesy of Heritage Malta).

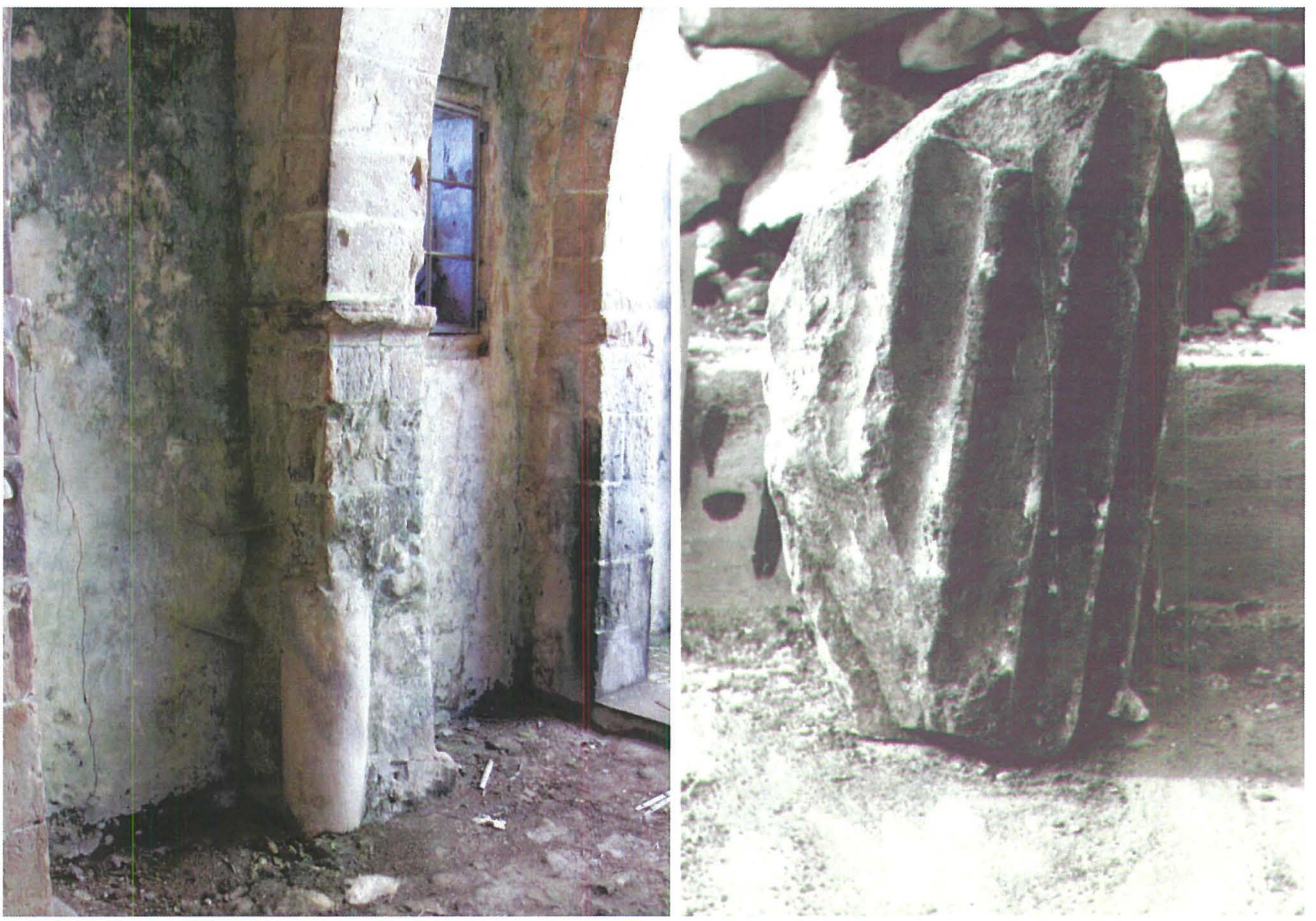

Figure 8. (a) the plain column shaft F369, at the Chapel of San Mikiel is-Sinċier at Ġnien is-Sultan (photograph by David Cardona) and (b) column fragment from a silo pit in Mtarfa (photograph reproduced by courtesy of Heritage Malta).

(Fig. 5d) now housed in a private collection in Rabat. Although this was recovered from a field in front of Strickland's estate in Mġarr, this place of discovery is not thought to be the original findspot (*pers. comm.* Dr D. Micallef). This piece remains, however, the only marble element that can be connected with certainty with a temple, not only because it is in marble but also because it is part of a pediment complete with the base of an *acroterion* – elements which the canons of Roman architecture strictly set as a symbol of divinity and royalty (Thomas 2007, 23-5).

The site of the possible temple of Proserpina at Mtarfa remains elusive. Only one fragment of a fluted marble column shaft (F281, Cardona 2010, 619) (Fig. 8b) recovered from a rock-cut silo pit at Mtarfa together with fragments of a Punic cornice (Mallia 1974, 51) survives from the area. Likewise, only one shaft incorporated within an internal pillar of the church of San Mikiel is-Sinċier (F369, Cardona 2010, 633) (Fig. 8a) survives from the numerous marble fragments mentioned by Abela around this church (Abela 1647, 209).

Private houses

Unlike the situation where Roman public buildings are concerned, private structures are plentiful and are much better documented. Nonetheless, there still remain a number of architectural elements that continued to pose questions up to recently. Among these are fragments within the National collection, the provenance of which was not previously known. Others had been recorded in various ways (e.g. reports, notebooks, and photographs) but have since been misplaced or thought lost.

The Roman villa of Ta' Kaċċatura in Birżebbuġa, (Fig. 1) the cleaning of which was completed by Ashby in 1915 (Ashby 1915, 52-66), is one of the most important and best recorded in Malta. The rooms of this villa give onto a small peristyle by 12 partly fluted Doric columns. Fragments of three such columns were in fact found during Ashby's excavations and recorded in a number of photographs taken during the same excavation (Fig. 9a). The whereabouts of these shafts were unknown after the photograph

Figure 9. (a) the three column fragments from Ta'Kaċċatura and (b) the puteal from Ta' Kaċċatura (photographs reproduced by courtesy of the British School at Rome, Thomas Ashby collection [php], TA-2230 and TA-2233); (c) reused, partly fluted column shaft F298 (photograph by David Cardona).

was taken and they had been thought lost. However, not only do these three columns still exist, but they can still be seen on the same site in which they were found, among the rubble that ended up in the cistern just below the peristyle (F295-F297, Cardona 2010, 85, 86, 401-3). Strangely enough, neither Ashby nor anybody else records a fourth column fragment (F298, Cardona 2010, 404) (Fig. 9c). One possible answer to this question may lie in the fact that this fragment was built into one of the walls (along corridor 16) and may have been overlooked. In his report Ashby also mentions the discovery of various fragments of a puteal, which he describes as a hollowed-up stone column with a concrete core (Ashby 1915, 56). However, a puteal usually signifies a decorated well-head and not a column (Hornblower and Spawforth 2003, 1280). Nonetheless, the fragments of this puteal had also gone missing after 1915 until a photograph of these fragments was found in Ashby's photographic archive at the British School at Rome (Fig. 9b). Through this record it has been possible to identify one of the fragments (central fragment shown in Fig. 9b) with one piece in the National collection of Heritage Malta (F67, Cardona 2010, 400).

The remains of the *domus* at Rabat are also well documented even though the reports are not as detailed as those that Zammit published for his other excavations. The architectural elements known to have come from this site are numerous. The National collection contains two particular fragments from plain Tuscan engaged corner columns that have always been labelled as unprovenanced (Fig. 10). A photograph in the photographic archive of the National Museum of Archaeology shows a section of the structures to the west of the *domus* during excavations, with one of these column drums visible

Figure 10. (a) Tuscan engaged column from the Roman *domus* (photograph by David Cardona) and (b) the same as it was being excavated (photograph reproduced by courtesy of Heritage Malta).

as it was exposed (Fig. 10). It is therefore now possible to say that these two had been found in the structures around the Roman *domus*. It is possible that these Tuscan shafts formed part of a smaller house in this area but the style cannot as yet be precisely matched to the surviving remains.

What next?

We have seen that although literary and epigraphic sources make reference to several temples and monuments present on the main island during the Roman period, very little has actually survived. Scholars mention that numerous architectural pieces could be seen in various areas within and around Mdina. Some of these pieces were even depicted in various drawings. The archaeological record has, however, produced very little concrete evidence of such public buildings. Through the careful examination of the written and drawn records and the identification of the fragments now held in various collections, the ancient Roman buildings start becoming better known. It is now possible to suggest that certain pieces are to be linked to buildings that once stood in the main city of Roman Malta. With the exception of the pediment fragment (F325, Fig. 5d) and unless more evidence is forthcoming, it is not possible to say what buildings these fragments are likely to have formed part of. Nonetheless, the individual architectural pieces provide the opportunity for further study, not least of the evolution of architectural decorations in Malta. Furthermore, the fragments that can now be connected with well-known remains of private residences may themselves also shed more light that may confirm or question the interpretations given so far on the decorative schemes of these houses. It is hoped that the provenance of such material as well as the careful study of the various architectural schemes found on Roman remains in Malta and Gozo will reveal more about the tastes and customs of the ancients in this smallest of Roman outposts.

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David CARDONA graduated in Archaeology from the University of Malta in 2003 and was awarded an MA in 2010 from the same university for his research on the architectural decoration of buildings in Roman Malta. The archaeology of buildings is one of his main areas of interest but the post of curator that he has held since 2007 within the Phoenician, Roman, and Medieval sites department of Heritage Malta means that he has to cast a wider net to satisfy his professional needs.

Wind funnelling underneath the Ħaġar Qim protective shelter

Simon Farrugia and John A. Schembri

It is often said that wind and associated processes induced by it have caused damage to the megalithic temples at Ħaġar Qim over the years. The aim of this paper is to explore whether wind funnelling is taking place beneath the protective shelter that now covers the Ħaġar Qim temple complex. A project was set up to test the extent to which the wind speeds beneath the new protective shelter differ from those outside it. Wind speeds were measured inside and outside the shelter in 25 different places and in four directions over a period of four months. The results were mapped using a Geographic Information System facility. It was concluded that wind speed does not increase beneath the protective shelter except at certain points within the temple structure itself.

Shelters have long been considered a means to protect historical sites. Already in the 1950s a decision was taken to shelter three archaeological sites in Sicily (Stanley-Price and Jokilehto 2002). Plans to shelter the prehistoric Tarxien temple complex in Malta from natural elements already existed in 1935 when a grant from the Carnegie Corporation was awarded for the purpose of erecting a shelter over the monument (Stroud 2005). However, studies that consider the effect of such protective shelters on wind processes have been lacking (Aslan 1997; Delmonaco *et al.* 2009; Cassar *et al.* 2011). For instance, aeolian processes are not considered for any of the shelters examined by Aslan (1997) which occur in Mediterranean climates in places like Rome, Syria, Jordan, and the Aegean islands. Of particular interest for its geographical location is the shelter erected over the remains at Piazza Armerina in Sicily in 1957. Even in this case, however, the aeolian processes have not been studied (Stubbs *et al.* 2011). Work on the Ħaġar Qim temple complex by Cassar *et al.* (2011) and the Environmental Monitoring Report commissioned by Heritage Malta (Heritage Malta 2006) acknowledge that the protective shelter over Ħaġar Qim could in fact affect wind processes. In this work we will explore these processes in greater depth and suggest possible management options.

Protecting the Ħaġar Qim temples

Ħaġar Qim is one of the oldest temple sites in Malta. Built about five millennia ago it was only excavated in 1839 (Evans 1971, 80-88). Since then, it has been exposed to the elements and has experienced damage from both physical and anthropogenic agents. It was only at the end of last century that decisions were taken to improve the management of the site. This included the erection of a fence for security purposes, parking facilities, and initial stone conservation measures (LBA & HM 2004). Today, the site is one of the most visited prehistoric monuments, being a prominent destination for tourists and educational visits.

In 1999, an expert group meeting was held by the then Museums Department to discuss the long-term conservation of the Ħaġar Qim temple complex. It was reported that the site deserved specialised conservation measures since it was prone to water-logging, subsequent material leaching, and exposure to salt weathering (LBA & HM 2004; Heritage Malta 2008). In view of this, and in the light of the urgency of the situation, it was decided that the option of shelters to protect the temples from the different weather phenomena was the most feasible of those proposed (Cassar *et al.* 2012) (Fig. 1). Every effort would be made to minimize the aesthetic impact of the shelter through the right choice of material. The

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Figure 1. Ħagar Qim and its protective shelter (photograph by Simon Farrugia).

shelter was to be a reversible intervention until better conservation options were found and, in addition, an information campaign would be launched to bring the project to the attention of the general public.

In their environmental monitoring final report, Lino Bianco and Associates who worked in collaboration with Heritage Malta (LB & HM 2004) also mention the different effects the shelter could have on wind processes. Of major concern was the need for the temples to be protected from increased wind velocity through the shelter in order to prevent problems of exfoliation, wetting and drying cycles, stone flaking, and back weathering (cf. Cassar 2002). Furthermore, the significance of certain astronomical alignments of the temple prevented any supporting structures for the shelters from being placed in front of the temple entrances (spaces 1 and 4 in Fig. 2).

Wind funnelling

Wind is the flow of gases from areas of high pressure to areas of low pressure but its movement is also affected by the earth's rotation, temperature differences, topography, nature and texture of terrain surface, other climatic conditions, and the shape of the built-up zones in urban areas. These built-up zones provide clues to variations in wind velocities and directions due to changes in the morphology of the buildings causing "wind funnelling", characterised by movement of air which is restricted by narrow passageways. This can be explained by the Continuity or Conversion of Mass principle which 'requires that a steadily flowing mass of fluid passing into a given volume must be the same as the mass coming out' (Hidy 1967, 49). Being a compressible fluid, air is easily affected by obstacles in its way from high pressure to low pressure points. Thus, if air travelling to a low pressure point encounters an obstacle in its course, it will alter its characteristics so that the same amount of "air" matter will travel in the same time frame. In this paper, we will call this effect "wind funnelling" as it resembles wind passing through a funnel – from its wide conical basin through its narrow outlet.

Wind funnelling could be happening within the Ħaġar Qim protective shelter if the same shelter is causing a compression of streamlines and forcing an increased wind speed through the gap between the bottom rim of the shelter and the ground – which ranges between 2.3 and 10.4 m in height above ground level (Canobbio 2007). Such compression is quite possible given the large extent of open unobstructed ground over which the wind can blow before reaching the temple and keeping in mind that before reaching the shelter, the wind has the whole troposphere to pass through. Here the shelter may be said to be causing confluence of streamlines 'causing an accumulation in fluid mass' (Hidy 1967, 49) in the volume of space beneath the shelter. It was thus decided that a research project be set up to test whether wind funnelling was occurring at Ħaġar Qim.

Materials and methods

In the absence of past wind-speed data covering the whole site, it was decided to measure directly and compare wind speed outside and inside the protective shelter. A pilot study was conducted in order to assess the feasibility or otherwise of the research project. This entailed setting up five stations for wind speed measurements along the north-south axis – one inside the temple, two at the shelter boundary, and two 30 m outside the shelter (Fig. 2). This distance reflects the theoretical end of the boundary layer, which is the distance from an obstacle where the effect of that obstacle on the trajectory and velocity of the wind stops being observed (Bagnold 1941). A propeller anemometer was used to measure wind speed because of higher resolution readings (0.1 m/s), low starting speed (0.1 m/s), and with less over-speeding errors than cup anemometers (error margin of ± 5%) when compared to the same technical specifications of

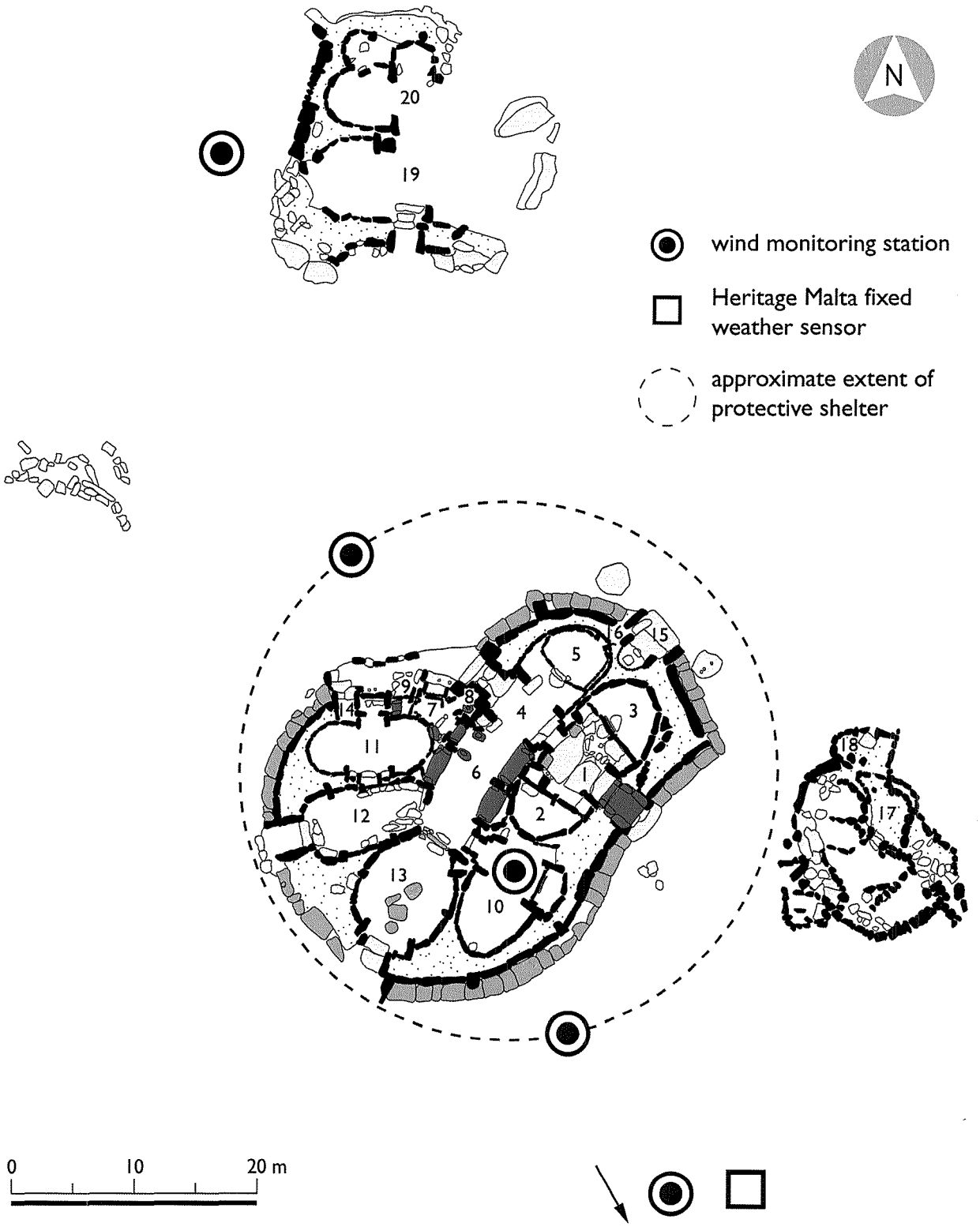

Figure 2. Location of wind speed pilot study and apse numbering (drawn by Maxine Anastasi on data supplied by the authors).

other types of anemometers (Pedersen *et al.* 1999).

The main problem with the propeller anemometer is that it is unidirectional and considers only one horizontal component and wind direction. It was thus important to ensure that both wind speed and direction remained roughly the same while measuring all the stations in a single day. Thus, when it was observed that the average wind direction or velocity being measured at each station changed by more than 5%, a new set of three measurements was taken to replace the previous one. In order to measure wind speed, the anemometer was held as far as possible from the observer and the modal wind speed value over a period of one minute was noted together with the lowest and highest wind speed at that station during that minute (Table 1).

This pilot study was then expanded in order to have a more complete coverage of the temple complex by using 25 wind monitoring stations. The outer six temple apses, the main entrance, and the exit together with the central space (numbered 6 in Fig. 2) had one station each, whilst another eight stations were located just outside each apse and main access ways at the boundary of the protective shelter. The other eight stations were located about 30 m away from the shelter. The purpose of this distribution was to provide a multilateral radial transect study of wind in the area while giving indications about the direction of any possible wind funnelling effect. Readings were taken in four cardinal wind directions

recorded wind speed (m/s) in each of the 25 sampling stations	North-East						West						South–South-West						East–South-East					
	low-limit T	average T	high-limit T	low-limit B	average B	high-limit B	low-limit T	average T	high-limit T	low-limit B	average B	high-limit B	low-limit T	average T	high-limit T	low-limit B	average B	high-limit B	low-limit T	average T	high-limit T	low-limit B	average B	high-limit B
	4	6	10	1	3	4	0	2	3	0	2	4	4	6	11	2	4	7	0	0	1	0	0	0
	0	1	3	0	0	2	1	2	5	1	2	5	2	5	10	2	3	6	0	1	1	0	0	1
	0	1	1	0	0	1	0	0	1	0	0	1	3	5	6	2	4	6	0	1	1	0	0	1
	0	2	3	0	1	2	0	0	1	0	0	1	0	2	7	0	0	1	0	0	1	0	0	1
	1	2	4	1	2	3	0	1	2	0	0	2	0	1	3	0	1	3	0	0	0	0	0	0
	0	1	3	0	2	3	0	0	1	0	1	2	0	5	6	3	4	6	0	0	1	0	0	1
	0	1	3	0	0	1	0	0	1	0	2	5	0	2	3	0	1	2	0	1	3	0	1	4
	0	2	3	0	1	4	0	0	0	0	0	0	0	1	4	0	0	1	0	0	0	0	0	1
	0	1	2	0	0	1	4	6	10	1	2	3	0	1	3	1	2	3	2	3	7	0	1	3
	4	7	11	3	6	10	3	5	6	0	0	1	0	1	1	0	1	2	3	4	6	1	2	4
	5	9	13	3	5	9	1	3	4	1	1	3	0	0	1	0	0	1	3	5	7	1	2	3
	2	5	6	1	2	4	4	5	6	0	2	4	0	1	2	0	0	1	0	3	4	0	1	1
	4	7	11	3	6	10	2	5	8	0	2	3	0	0	1	0	0	1	0	1	2	0	0	2
	4	6	8	0	2	5	3	8	11	2	4	6	2	4	4	0	1	3	1	2	3	1	1	3
	4	6	8	0	1	3	3	7	10	3	6	7	0	3	5	0	2	4	1	2	5	0	1	3
	3	5	6	1	2	3	2	5	9	0	0	2	0	1	3	0	0	3	4	5	6	1	2	5
	3	5	7	2	4	6	1	4	8	0	1	1	1	3	5	1	2	3	4	5	7	2	3	5
	4	6	9	1	1	3	0	1	5	0	0	1	9	10	12	5	7	9	2	4	7	1	2	3
	3	7	12	2	4	8	1	4	5	0	1	2	4	7	9	1	3	6	2	4	5	1	1	3
	2	5	9	0	2	3	3	8	10	2	4	6	4	6	9	2	3	5	2	5	7	1	2	3
	5	7	10	3	5	6	3	5	7	2	4	8	3	5	7	2	4	6	2	3	6	0	0	1
	5	8	11	2	4	6	4	5	6	1	2	3	4	8	10	2	4	8	1	2	5	0	0	2
	1	3	8	0	1	2	2	4	5	1	2	3	4	7	9	1	3	5	2	3	5	0	2	2
	2	5	10	1	3	5	3	5	8	0	1	2	3	6	9	2	4	6	1	3	6	0	0	1
	1	5	9	0	3	5	0	0	2	0	0	1	6	7	10	3	4	6	2	4	5	1	2	4
mean wind speed (m/s)	2.3	4.5	7.2	7.2	2.4	4.4	1.6	3.4	5.4	0.6	1.6	3.0	2.0	3.9	6.0	1.2	2.3	4.2	1.3	2.4	4.0	0.4	0.9	2.3

Key

low-limit T: lowest value of wind speed measured at 2 m above ground level

average T: model wind speed measured at 2 m above ground level

high-limit T: highest value of wind speed measured at 2 m above ground level

low-limit B: lowest value of wind speed measured at 0.1 m above ground level

average B: model wind speed measured at 0.1 m above ground level

high-limit B: highest value of wind speed measured at 0.1 m above ground level

North-East wind readings were taken on 16 January 2010 starting at 13:30 local time.

West wind readings were taken on 24 February 2010 starting at 16:15 local time.

South–South-West wind readings were taken on 30 November 2009 starting at 11:30 local time.

East–South-East wind readings were taken on 3 March 2010 starting at 17:30 local time.

Table 1. Wind speed data and calculations.

on the windiest days of the months between November 2009 and March 2010, as per weather forecast predictions (Table 1). Despite the sources of error of having both the actual wind speed and directions differing from those predicted, relatively high wind speeds were measured from the west, south-south-west, north-east, and east-south-east directions. Wind speeds were measured at heights of 2 m and 0.1 m above ground level respectively in order to have indications of turbulence arising from friction with the ground surface and other obstacles (Bagnold 1941).

GIS Mapping

For a better visualisation and understanding of the wind patterns in the Ħaġar Qim temple area, the wind speed values at each station at heights of 2 m and 0.1 m respectively in each of the four wind directions were inputted into a Geographic Information System, ArcGIS 9.3. Using an Inverse Distance Weighting interpolation (IDW) technique and assuming that the temples lie on a ubiquitous isotropic plane, the software calculated wind speeds based on the assumption that the further away you go from a point, the less the influence of that point on its neighbours and vice-versa (Mitchell 1999). Although this meant that the software itself ignored that there was the protective shelter and the temple itself, this technique was considered as appropriate since wind speeds at two nearby points on similar topography would have similar wind speeds. Moreover, by assuming that there were no obstacles in the trajectory of the wind, any influences of the actual obstacle would presumably be visible on the map by sharp changes in wind speeds (Mitchell 1999).

A power parameter of 4 was assigned in the IDW since it was considered to obtain a balance between the influence of distant points and those of nearby points. With a raster resolution of 0.3 m and a variable radius of 9 m, the algorithm used wind speed data from recorded points within a nine-metre radius of the point to be estimated and calculated a wind speed which could be generalised for a square of side 0.3 m. Wind speed was then categorised into 10 colour-coded classes, with a colour assigned to each class range for distinction purposes (Fig. 3). Although this immediately revealed the existing wind pattern it could easily lead the user to think that there were very sharp boundaries between areas of similar wind speed, which is definitely not the case.

Discussion and observation

The main factor that is apparent from the four maps of wind speed conditions in the Ħaġar Qim area is the general drastic drop in wind speed inside the temple from all the directions that the wind may be blowing (Fig. 3). This immediately seems to prove that no wind funnelling is occurring under the protective shelter or rather, that the wind is actually losing velocity as it passes through the shelter and regains it as it exits from below it. On the other hand, minor increases in wind speed can only be noticed when the airstream passes between two substantially large megaliths and seem to be independent of their location with respect to the shelter itself.

It is only the air at the same height of the shelter (2.3 m at its edges) that is actually passing from one side of the shelter to the other. Due to the dome shape of the protective shelter, the further the airmass entering the shelter travels inside it, the larger is the space which the airmass can occupy since the shelter becomes progressively higher, and has an increased volume. Thus as explained by Bernoulli's principle, the airmass will continue to lose velocity until it reaches the highest point inside the shelter at its centre. At this stage pressure differences will force it to pass through a lower height until it reaches the opposite end of the shelter (Fig. 4). In fact, slight increases in wind speed were observed on the leeward side of the shelter in different wind directions. During north-easterly winds, an increased wind speed was observed to the west of the temple at a distance of about 30 m outside apse 12 and during the observed south–south-west wind, another increase in wind speed was noticed to the north-east of apse 3 (Fig. 2). While this confirms our theoretical explanation, this minor increase is not considered to be significant because the wind speed never reaches the strength it had when it first entered the shelter.

A minor but significant exception to the above generalization would be the case of east-south-east wind at the main Ħaġar Qim entrance facing south-east. Wind funnelling could be observed and felt there since wind speeds just inside the temple complex are slightly higher than those just outside by one to two metres per second as seen in figure 3. While in the map of the east-south-east wind (Fig. 3) the wind

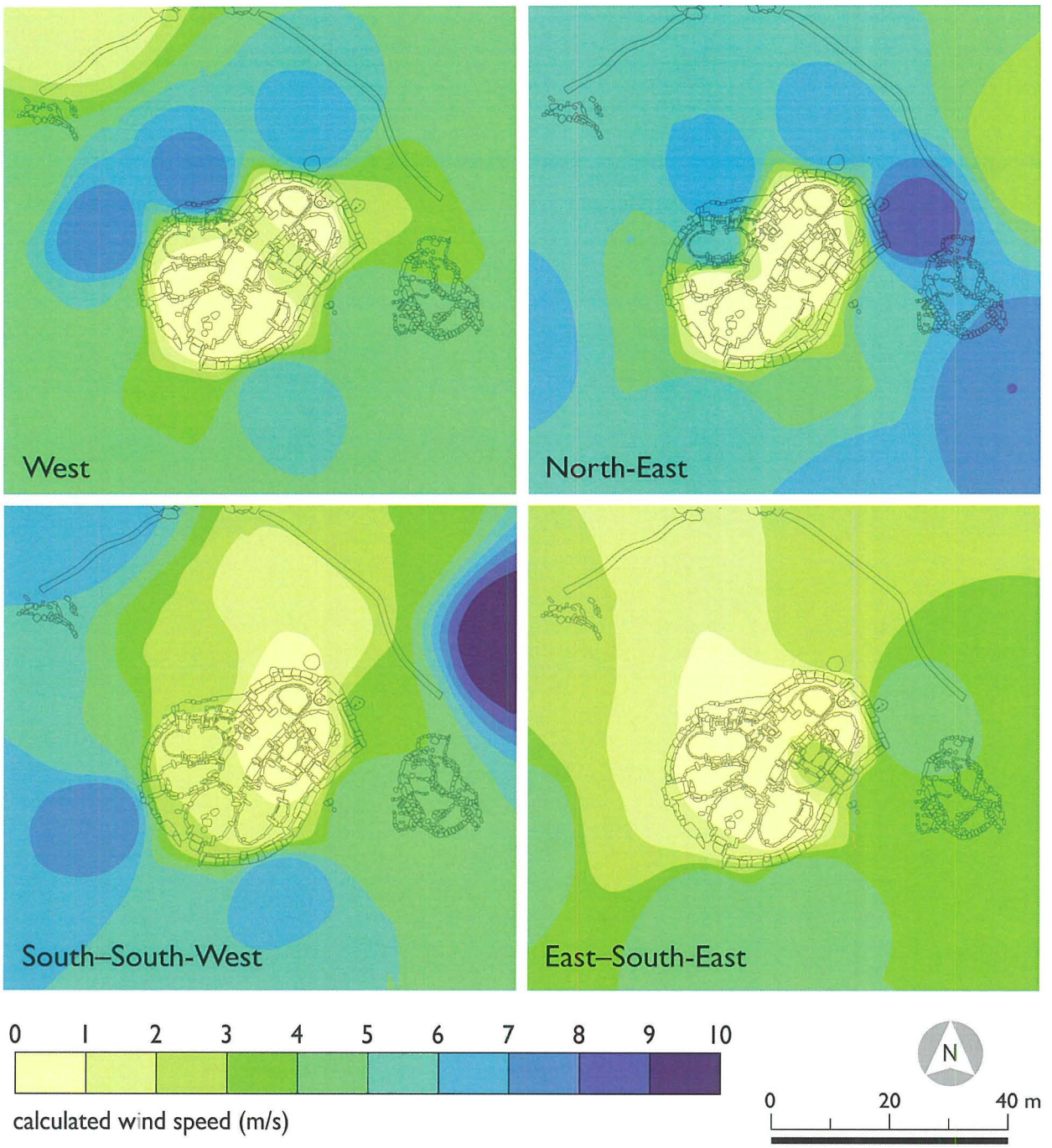

Figure 3. Four Inverse Distance Weighted interpolation maps of wind speeds at 2 metre height under four different directions at the Ħaġar Qim area.

pattern outside the main entrance continues inside the temple complex, the opposite occurs at the same location in the case of wind speeds from the other three directions. In winds coming from the south-south-west, west and north-east, the wind pattern inside the temple continues with a decrease in speed down to less than one metre per second when measured just outside the main entrance.

It is interesting to note that this process is not replicated on the other side of the main corridor, as happens in the case of westerly winds. This may be because the main entrance of the Ħaġar Qim temple complex is the only place where a lintel is still in place over two upright megaliths. Wind funnelling could thus be taking place here as the air stream which passes through the 2.3 m gap at the shelter edges is

constrained to pass through a narrower and lower passage into the shelter because of higher pressure outside the main temple entrance. Although there was also an increase in wind speed noted in this same part of this entrance when wind coming from a westerly direction was measured, this was felt throughout the whole passageway and not only in the first part just beneath the lintel as was the case with an east-south-east wind.

Most of the above observations were replicated for wind speeds at a height of 0.1 m even though wind speeds here were much lower (Table 1). Statistical correlation between both datasets resulted in a Pearson coefficient of 0.815 at $p<0.01$ significance level. This agreed with Bagnold's (1941) observations of how wind speed varies with height since over a height of 10 cm friction caused by terrain texture would be at a minimum and the logarithmic relationship between these two variables will approach a straight line. At this point we may predict that physical weathering and erosion processes resulting from wind will be at a minimum inside the temple and we will therefore focus on the possible direct effects of this reduction in wind speed. Although during the first months from the completion of the shelter no significant deposition was observed in any part of the temple (*pers. comm.* J. Cassar 2010) we can however identify areas where this could occur in the future. Empirical evidence suggests that the outer temple walls may be the first structures which could experience deposition. This is mainly because they are an excellent wind barrier in conditions where wind speeds are already decreasing. The lower parts of most of these walls are also covered by vegetation which could encourage the trapping of wind-blown particles. Since the megalithic walls are not smooth, with some of them even showing signs of severe erosion processes (Vannucci *et al.* 1994), wind reflection would be difficult and thus any previously deposited sand would not be easily blown away (Mainguet 1997, 170-92). The inner apses to the west and east of the main corridor could also be prone to deposition, especially on windy days when wind could carry particles in saltation and suspension inside these apses – particularly space 11 (Fig. 2) which stands on ground about 1 m higher than the rest of the temple complex.

Another possible aspect which has been identified and could occur with lower wind speed is the growth of fungi and vegetation which could cause biological weathering and erosion (Heritage Malta 2008). Following empirical observation it was evident that this was also improbable mainly because the shelter protected the area from precipitation and sunlight which are essential for the growth of these organisms. It was also mentioned to us that the gardeners at Ħaġar Qim were finding less vegetation to clean manually in the months following the erection of the shelter, indicating the effect this is having on the growth of flora (*pers. comm.* Grima 2010).

Concluding remarks

After conducting the wind monitoring fieldwork and analyzing the collected data, two main conclusions were drawn for the Ħaġar Qim complex with regard to wind funnelling:

1. The wind is actually losing velocity as it passes through the shelter and regains it as it exits the shelter (Fig. 4);

2. While the protective shelter itself is not causing a significant increase in wind speed, there is an evident increase in wind speed between specific megaliths. This is especially true with south-easterly

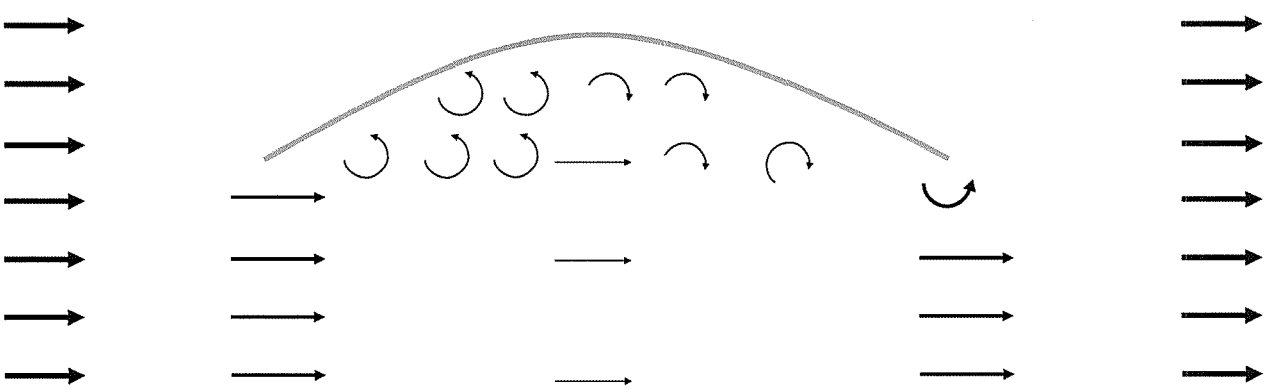

Figure 4. Simplified schematic diagram of wind patterns below the protective shelter as suggested by the authors from the observed results. Increasing arrow thickness indicates higher wind velocities.

winds blowing through the main south-east facing entrance made up of a lintel resting on two megaliths.

These conclusions would be insignificant if they did not lead to management action. Such action should not be focused on any single observation but on a series of detailed observations. The aim should be that of managing several aspects of the environment at Ħaġar Qim so that no one measure would counteract the other. The ideal would be an integrated management approach targeted at keeping wind speeds beneath the Ħaġar Qim protective shelter at a minimum without inhibiting air circulation. Such measures should be easily reversible considering the temporary lifespan of the protective shelter.

More studies are needed to further develop the above observations. As they stand, they can neither be generalized for every weather situation throughout the whole year nor extended to similar megalithic structures, such as those at Mnajdra. More readings should be taken to permit a better sampling of wind speeds. Fixed anemometers such as the one re-installed in May 2011 inside the Ħaġar Qim temple complex would enable a 24-hour continuous wind speed monitoring, thereby permitting wind speed modelling for different microclimatic conditions. Measuring wind speeds at more locations beneath the protective shelter could further explain the processes which are slowing down wind speed. Such data could give additional insight on turbulence inside the temple complex and the shelter and identify areas which would be more susceptible to wind erosion.

Acknowledgments

First of all the authors would like to thank the Malta Archaeological Society for hosting the public lecture "Blowin' in the wind' - Aeolian processes at Ħaġar Qim protective shelter " at Valletta on the 4th December 2010, that paved the way for the development of this paper, especially after the discussion that followed the talk. Secondly we would like to show our appreciation to the staff at Heritage Malta and Dr Reuben Grima for their continuous support at the time of the project and two peer reviewers for their contribution to this work."

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Experimental Archaeology

Christopher Busuttil

It is often said that it is easier to learn by doing. This paper explains what experimental archaeology is and shows through examples that it is a viable discipline to be used to increase public appreciation for archaeology and allow a better understanding of what happened in the past. The advantages of applying experimental archaeology in Malta are discussed.

'Tell me and I forget, show me and I remember, involve me and I understand.' (Schindler 2002)

Defining terms

The term 'experimental' carries multiple connotations. It suggests something provisional, 'being tested', perhaps not yet ready for release to the wider public. It is a word haunted by a sense of danger – an indeterminate idea defying simple understanding. On a more prosaic level 'experimental' conveys ideas of laboratories and ultimately perhaps even Frankenstein. The idea of danger returns with the unquenchable thirst for knowledge giving rise to images of mad, bulbous-eyed scientists with long, white hair pursuing all manner of experiments in the name of science, often detrimental to humanity. People are familiar and perhaps more comfortable with the idea of using experiments in core science subjects, but it is conceptually more difficult to understand how experiments can be used to explain how individuals and whole communities chose to make sense of their worlds and even reproduce life and society in ancient times.

Experimental archaeology has been explained as a science, defined as a 'controllable imitative experiment to replicate past phenomena [...] in order to generate and test hypotheses to provide or enhance analogies for archaeological interpretation' (Mathieu 2002, 1). However, the desire for controllability often compromises the realistic nature of archaeological case studies which use substitute modern materials and methods to record and measure specific properties. Such breaches in authenticity result in difficulties imagining how archaeology finds a sense of congruency with the experimental protocol. In fact experimental archaeology was indirectly attacked by the post-processual school for being too much of a science and tool for processualism. However, it was later realised that experimental archaeology includes much more than the simple characterisation of a material's physical properties. Ideas on beliefs, behaviour, and political systems could be revealed by creating measurable experiences allowing experimentalists to consider the possibilities of being human when confronted with specific material conditions manifested in particular ways (Mathieu 2002, 1). This is where, for example, Tilley's phenomenological approaches to replicating how people sense, perceive, and feel their way through the world become so relevant to experimental practice (Mathieu 2002, 4; Tilley 1994).

It is however important not to forget what archaeology is all about. The ultimate aim of archaeologists poring over the intricacies of long-lost artefacts is not the detailed description of

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mysterious objects but the understanding of what it was to be human in times past and places forgotten. Experimenting with architecture, finds, and a range of practices provides us with opportunities to understand ways of being human beyond our everyday experience. By using our archaeological knowledge of some of the physical conditions with which the ancients co-existed, we can start to move towards inhabiting similar spaces and engaging with artefacts in possibly similar manners: rebuilding a Neolithic house based on our archaeological knowledge is to recreate a space that past communities would have inhabited in specific ways (Stone and Planel 1999), facilitating some practices while constraining others. In other words our subsequent practices become conditioned by the structures we inhabit. Winston Churchill (2004, 358) greatly understood this when he said, 'we shape our buildings; thereafter they shape us'. Light a fire in our reconstructed house. Evidence suggests we choose a central place beneath the highest aspect of the roof. Gather friends and we find ourselves encircling the fire. Perhaps our position is itself significant? Immediately, we can think of recreating a past as it could have been.

Authenticity is a central issue. Using original materials, we have already started explaining the past in a way that a textbook could never hope to achieve. It is through the active use of materials that we can start revealing meaning and the choices people make to construct an understanding of the world they live(d) in.

As a discipline, experimental archaeology is not universally embraced. It is greatly used as a feature of heritage centres and museums in northern Europe in contrast with southern and eastern parts of the continent, where it rarely features in museums and is viewed cautiously by the academic profession (Busuttil 2010; Paardekooper 2010). It is the aim of this paper to suggest that experimental archaeology is a viable form of archaeology that should be more frequently embraced by archaeological communities that have traditionally given short shrift to experimental approaches. This paper also aims to highlight the potential for new synergies, that is connections that can serve to facilitate and widen public engagement, and appreciation of archaeology and heritage in diverse contexts ranging from education to tourism.

Figure 1. Testing temperatures and recording data during a copper smelting experiment (photograph by C. Busuttil 2011).

Experimental archaeological theory

Experimental archaeology is rooted in antiquarianism and the beginnings of archaeology as a discipline. It was first used in the early 19th century by Scandinavian archaeologists interested in using scientific procedures to explain human behavioural patterns in the archaeological record. One of these archaeologists, Sven Nilsson, compared Scandinavian stone tools to worldwide ethnographic specimens to identify how they were used and hafted. He experimentally replicated them to complement the ethnography (Trigger 2006, 130). A drought in the 1850s enabled archaeologists to find perishable artefacts in excavated Swiss Lake dwellings, including hafted stone tools, which verified Nilsson's reconstructions (Trigger 2006, 134-35).

Experimental archaeology is relevant across all time periods, embracing diverse sub-specialities from zooarchaeology to landscape approaches, and encompasses all aspects of archaeological endeavour from strictly empirical studies to theoretical reconstructions. It is not something that 'occurs' at the end of an archaeological study simply to test hypotheses put forth by post-excavation specialists. To limit experimental archaeology to just a science omits the number of wide-ranging studies that have been conducted in its name (Mathieu 2002). Identifying the use of an artefact and understanding site formation by studying the erosion of reconstructed buildings are just two examples of archaeological experimentation (Reynolds 1999). In the 1960s, New Archaeology closely allied experimental archaeology to the scientific method with studies conducted using

a series of objective and controlled experiments to test a hypothesis. Experiments are defined as the testing of hypotheses in controlled environments, which means controlling most if not all variables that regulate the outcome of the experiment to explain what is happening (Ingersall *et al.* 1977, xv). Another aspect is repetition of the experiment by experimenter and peers to show that the initial result was representative. Detailed recording is required for others to repeat and test the experiment with the aim of augmenting data (Coles 1979, 9). There exists a tension between active engagement and participation in an experiment and the process of structured recording that makes observation and recording a challenge (Fig. 1). Anyone who has attempted to produce pottery will immediately understand this issue, since the ability to record is often compromised by the viscous adherence of clay.

Archaeological experiments can be categorized into four classes offering differing qualities for various studies. The best known class involves the replication of excavated material. The degree of authenticity achieved depends on the experiment and can range from visual replicas satisfying only the visual need, to more expensive full replicas produced using authentic materials and methods faithful to the original making of the artefact. This class tests hypotheses on the creation, production, and use of the artefact (Mathieu 2002, 2-3). The second class consists of 'behavioural reproductions' frequently derived from full replicas since certain behaviours are associated with using such a replica. Objectivity is needed when carrying out experiments: the way we chop down a tree using a modern axe may not be the same as when using stone tools. Comparing different experiments often provokes discussion and contemplation on the different aspects of function, use, and behaviour. A third class of archaeological experiment involves studying natural and cultural processes of site formation to understand how artefacts or buildings weather and decay over time to become what archaeologists later excavate (Ingersall *et al.* 1977, xv). The last class, 'ethno-archaeology', involves an ethnographic expedition to look at the relationship between human behaviours, the 'material culture and the physical environment in a functioning observable setting' (Ingersall *et al.* 1977, xv).

Scrutinising experimental practices through the medium of our bodies requires us to reconcile our sense of being in the world with established ideas of how we represent the world. In arguing that perception is a two stage process, anthropologists Edmund Leach and Mary Douglas established a disciplinary approach that considered perception as an ultimately cerebral act encasing cultural information within a process of mental representation (Ingold 2000, 158). This perspective limits perception and cultural representation to a concern of the mind: knowing that the body is divorced from the world which is mediated by the brain.

However, as Ingold (2000, 166) states, 'what we perceive must be a direct function of how we act', and the skills and habits one's body learns do not come from mental contemplation but from habitually performing the same tasks in particular ways and gestures over and over again. Bourdieu (1990) defines this as the 'Habitus', the cultural knowledge generated by going about a daily, mundane life leading people to acquire specific concepts that give a certain perspective to the world they move in. These patterns are transferred from one another within a society and are enduring, changing over long periods of time or in relation to a particular context. Therefore, bodily movements become signs for a viewer to recognise and understand as they are left to us from the past through material contexts. By analysing artefacts and understanding how they were made and what they were made from, we begin to read these signs.

Whither experimental archaeology?

Whenever the archaeological record is interpreted in the field or at a desk, theories evolve as ideas flash across the mind. Sometimes the function of an artefact is explicit, while at others its understanding is camouflaged in an ambiguous haze of form and function. Archaeology is notoriously abstract and consistently presents interpretive challenges, many restricted to archaeological evidence or authoritative assertions of experts. Experimentation offers a fresh way of looking at old and new problems alike, the opportunity to have a valuable, easily forgotten, encounter with a material reality shared by our forebears.

Experimental archaeology is multidisciplinary, focusing diverse skills on particular areas of archaeology. It can combine the use of craft skills such as ceramics or carpentry, and the harder sciences of chemistry along with the analytical capabilities

of instrumental characterisation. Experimental archaeology lends itself to interdisciplinary collaboration, but more than that it also acts as a bridge between science and the more human-centred practices that typify the humanities. This totality of knowledge should be brought to bear on the understanding of our own heritage for this is surely a better way to understand and appreciate the magnitude of our species' development and achievement. People outside the field should be encouraged to work within archaeology as they offer valuable perspectives on the diversity of human practices.

As craft users, it is necessary to either learn the craft or involve someone who has experience in it. Indeed while carrying out a ceramic experiment to throw light on the production of Maltese prehistoric pottery, archaeology undergraduate Helga Borg used local potter Paul Haber's expertise whenever she had a problem. This was vital to her understanding the outcome of her work (Borg 2005; Borg *pers. comm.* 2012). However, many archaeologists and the general public tend to set a divide between craft and thought, believing that manual labour is inferior to, hence less valuable than, cogitation. People forget that before creating something craftsmen bring their insight and experience to bear on how an object will look, be made, what materials to use and even how it will work. All this defines the final object's form and function and is a task worthy of any intellectual. As experimental archaeologists, indeed as archaeologists, much of what we do is manual labour, with our hands literally in the dirt. However, we then resort to academia to communicate the knowledge and results we gain to the rest of the community. Language is used to transmit this knowledge of actions in an understandable context relying on the 'dialectic between theory, practice and experience' (Høgseth 2009, 5), highlighting the need for a combination of both theoretical and practical knowledge.

Parents often tell children not to do something because they might get hurt and repetition sometimes has the effect of awakening the desire to do it anyway and test the outcome. It is at this point that we start to question the reality of life and begin to experiment, try things out and learn from both mistakes and practical experience. This is one of the discipline's greatest points: playing around with materials with an open mind is the best way of learning, trumping teaching or reading a book. Even when not actually testing a particular hypothesis but experimenting for ourselves how to go about flint-knapping, for example, we are learning and gaining an affinity for the past.

Across Europe, particularly in the central and northern regions, experimental centres and open-air museums have been established since the 1920s for visitors to experience the past through reconstructions, demonstrations, and hands-on learning of different crafts and skills to understand how people lived and worked (Eickhoff 2005, 81; Paardekooper 2009, 66). These activities make the past far more understandable than traditional learning, a fact recognised by educational systems. Throughout the year these places are filled with students on fieldtrips to learn history, mathematics, and core sciences and, above all, to have fun learning (Stone and Planel 1999). There is a general tendency to go back to learn more. Some of these places have also set up workshops explaining how archaeological excavation is carried out. The added value of experimental archaeology and these centres is that the general public appreciates past societies to a greater degree, persuading them to provide support and care for heritage (Paardekooper 2009, 66-67).

The experimental archaeological centre of Lejre in Denmark maintains that without its existence since the 60s, Scandinavian archaeology would have much less support and interest as 'there is no Dane younger than 50 who has never been to a historical workshop or medieval centre' (Paardekooper 2006, 95). The open-air museum of Terramara di Montale (Italy) came about as a result of a demand for new methods of exhibiting past cultures combined with a scientific approach and higher level of interaction between visitors and exhibits (Pulini and Zanasi 2009, 17). The life-sized reconstruction of a village based on local archaeological evidence gives an authentic research experience, taking visitors back in time, retracing the steps of an archaeologist from the excavation stage to studying the artefacts in laboratories, while trying out archaeology for themselves (Pulini and Zanasi 2009, 17-18).

Various teaching methods come into play. Reconstructions of buildings, tools, and artefacts demonstrate different traditional crafts, explaining what is happening and why. The traditional-styled museum set-up of display cases with information panels is available for people looking for more information. However, the biggest advantage of reconstructions is when people are given a chance to try things out for themselves – getting their hands

dirty building a dwelling, rowing a dugout canoe, shaping a pot, cooking in a traditional Roman way, and savouring the result, etc. People are sometimes allowed to sleep in the reconstructed houses and live there for a short time, thus keeping the history and indeed the spirit of a place alive. The experiences of participating in these activities dynamically build on what has been learnt at school. They are fun, never forgotten, and far more interesting to children and adults. Saraydar (2008, 4) says that 'through this experience [of felling trees with stone axes], my muscles and my brain learned things [...] that could never be forgotten and no written or visual source could ever adequately convey [...] The people who made and used these tools no longer seemed quite so remote in time and space'.

These may not be experiments in the full sense of the word, but each of the demonstrations or reconstructed artefacts at these places originally derived from an experiment, which is being repeated in a simpler form. Though the research potential of repeating experiments is limited, the experience of carrying out the work for the first time will be remembered, and brings individuals closer to how people lived and worked in the past. This affinity puts into context what is excavated as it becomes more and more understandable. This runs on par with Bourdieu's 'Habitus'. This is not to say that experiments or even demonstrations should not be updated or revised as that would be unethical and would give a false impression to the general public and even archaeologists (Townend 2007).

Actual experiments are of course very much needed as they help verify what archaeologists think and they weed out impossible suggestions that seem quite logical until put into practice. Coles, an archaeologist and advocate of the modern experimental archaeological discipline, said that 'some things work, some things do not, but unless we make the attempt, we'll never discover the most fruitful lines of enquiry' (Paardekooper 2009, 67). Doing it wrong should not be discouraging. The negative outcome is actually positive as it proves that an alternative way should be sought. The important thing is that it has been tried and recorded. Coles argues that the inaccuracies in the 1948 reconstruction of the Viking fortress at Trelleborg and its long survival served as a constant reminder to scholars, pushing them to conduct critical examinations and come up with alternative theories (Coles 1979, 145).

Figure 2. Helga Borg preparing her recreated, ceramic vessels for firing in 2005 (photograph reproduced by courtesy of N. Vella).

Experimental Archaeology in Malta

In Malta there has been little work in experimental practices. A BBC documentary in 1955 on the nature and function of the Maltese cart-ruts looked at how they could have been made (Fig. 3) (Evans 1971, 203). A civil engineering student has also attempted to establish whether the prehistoric temples were roofed or not, using a combination of mechanical tests applied to large limestone beams and computer-generated reconstructions (Xuereb 1999). Few actual research experiments have, however, been carried out. Two Maltese students have recently used experimental archaeology in their theses and a third in a doctoral dissertation.

Clive Vella systematically analysed lithic assemblages using morphology and perceived functionality to create a new classification to better compare the more informal Maltese assemblages to the 'classic' Mediterranean tool type. Experimental archaeology was used to compare the superior imported flint to the inferior local chert that tended

to be unpredictable, breaking into shorter lengths. His experiments were useful as a means of exploring human choices and technology, finding that Maltese prehistoric communities made a conscious choice in flint and chert use that went beyond issues of availability (Vella 2009).

Helga Borg analysed how experimental archaeology and ethnographic studies could shed light on Maltese Neolithic pottery-making techniques (Borg 2005). A ceramic typological development was formulated by studying the development of Maltese prehistoric pottery based on stratigraphic excavations. An experimental exercise was devised to produce, decorate, and fire vessels using local clay and prehistoric technology to recreate Maltese Neolithic ware (Fig. 2). She collaborated with Clive Vella who produced chert tools with which to decorate the pots. The ceramic vessels exploded during the firing process, but despite this Borg remains optimistic knowing that she has extended her knowledge of Maltese Neolithic pottery-making and that of others. Using the results of the experiment she postulated on the decoration techniques used in the Neolithic and presented reasons why her firing failed. Thus a path was laid out for any future experimenters wishing to continue working along the same lines.

In her doctoral research, Cynthianne Spiteri Debono addresses the transition to agriculture before the onset of the Neolithic in the western Mediterranean, using Organic Residue Analysis (ORA) to determine the contents of ceramic vessels by analysing their lipid content and discover whether the pots were used to process or store food. Known plants were cooked in reconstructed cooking pots to obtain their lipid profile, to determine the likelihood of this profile surviving on an archaeological timescale, and determine whether particular, identifiable biomarkers are preserved. A controlled feeding experiment was also set up at the Għammieri Government Farm to establish isotopic signals for the Mediterranean region. The success of her work could lead to a better identification of foodstuffs and understanding of pottery use.

When questioned about experimental archaeology each asserted to varying degrees the importance of testing archaeological theories and determining whether archaeologists' interpretations are realistic and plausible. Vella went further, deeming experimental archaeology both a heuristic device and educational tool owing to its hands-on approach that 'livens' the past. They all believe that experimental archaeology would be invaluable to Maltese archaeology, helping to answer questions, especially about those areas where there is very little outside knowledge. Vella suggested that experimental archaeology should reach the school curriculum since it is a scientifically yielding field that makes archaeology more accessible.

All have plans for future experiments. Borg has been re-reading her work and intends continuing with her experiments. Spiteri Debono says there is still much to learn in ORA and that experiments are crucial to understanding how residues are formed and for detecting commodities processed within ceramics. Vella is now using edge use-wear analyses to determine through experiments the materials that lithics were used on in the past.

Concluding remarks

It may be that experimental archaeology is treated with scepticism in the southern and eastern regions of Europe, as it goes against the traditional archaeology of those areas. The experimental work done in Malta to date is limited compared to northern Europe but the results achieved so far by students are very promising. Undoubtedly, knowledge will change with time as experimentation, demonstrations, and hands-on activities increase, not only within tertiary research institutions but at schools and possibly at experimental centres or open-air museums set up expressly for that purpose. The advantages for education and tourism should be immense.

Figure 3. Slide car used by John Evans in 1954 to experimentally test the origins of the Maltese cart-ruts for the BBC (photograph by C. Bonavia reproduced by courtesy of the National Museum of Archaeology Archives/Heritage Malta)

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The original discovery of the Roman shipwreck at Xlendi, Gozo

John Wood

'Xlendi Bay in Gozo is an important archaeological site but this was not realised until the 1960s. The reason for this is that its importance is maritime and its potential was only brought to light with the accidental discovery of artefacts on the seabed by British Navy divers. This discovery and subsequent investigation of the site came soon after SCUBA equipment started to become widely available and closely followed the development of the new discipline of underwater archaeology [...] The objects that were raised by these pioneers are now held in the Gozo museum where they attract a lot of interest from members of the public [...]' (Azzopardi 2006, 1)

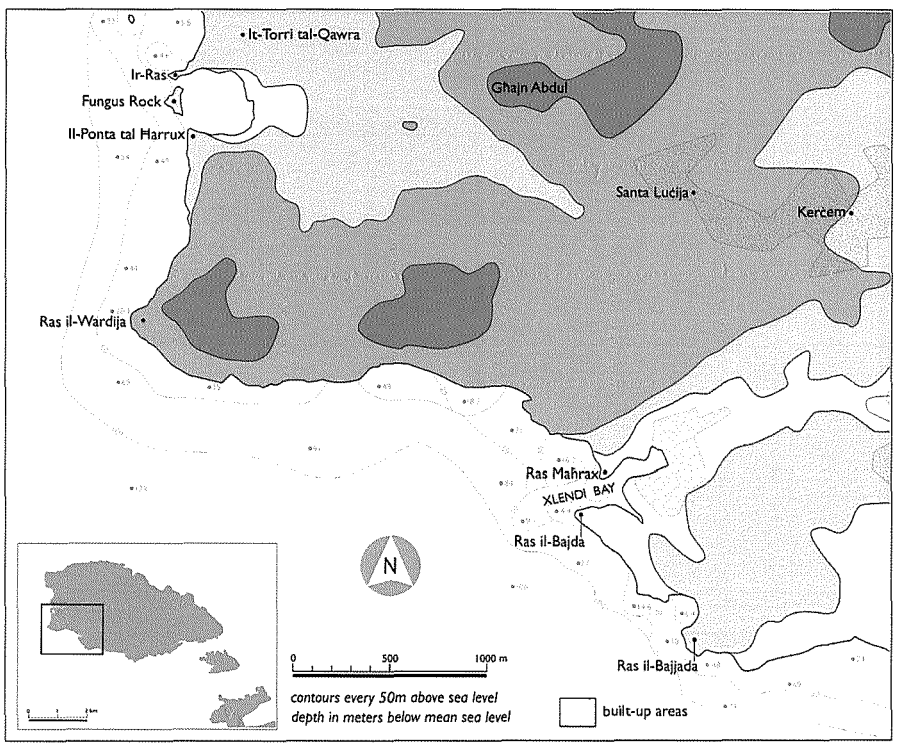

Figure 1. Xlendi Bay in south-west Gozo, Malta (drawn by Maxine Anastasi).

It is not often that one is in the right place at the right time. Those lucky enough to be in Malta with the British Navy in the summer of 1961 found the perfect time and place to learn to dive. Health and safety implications dictated a disciplined approach, both individually as well as on a group basis. Therefore, several like-minded colleagues who wanted to do something with the new skill, formed an Outward Bound Association since SCUBA diving was a recognised qualification.

Under the auspices of the Fleet Recreation Officer at Lascaris, seven divers and three crew from the Royal Naval Air Station, Ħal Far, requisitioned Motor Fishing Vessel 256 for an underwater search for archaeological sites off the Tunisian coast. Application for diplomatic clearance made to Tunisian authorities in February had not been received the day before our proposed departure on 10 June 1961. Captain Sutton, therefore, ordered the crew to proceed to Gozo to search harbours and bays on behalf of the Museums Department (Martins 1961).

Team spirit was welded by the successful raising of the wing of a legendary Spitfire aircraft from a depth of 9.2 metres in Qala Dwejra. Later we were joined by George Masini from the Gozo museum to give direction to our undersea endeavours. At first we explored Ramla Bay, but without success and as consolation sought an octopus for supper in Xlendi Bay. That evening we found our fish supper ... and in the process found amphora sherds in abundance at the foot of the rock awash at Ras Mahrax in the harbour mouth (Fig. 1).

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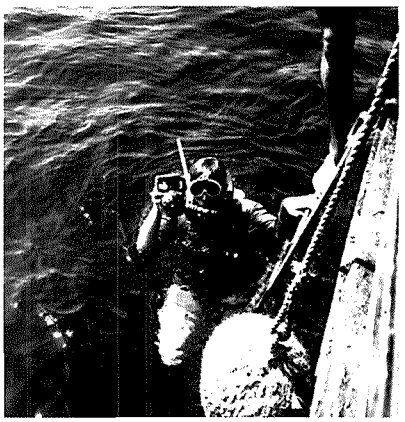

Figure 2. Small pot being brought to the surface (photograph reproduced by courtesy of Chev. J. Scicluna archive).

Figure 3. An amphora is held by Able Seaman Viney watched by (from left to right) Able Seaman Meakin, Leading Airman Mitchell and Petty Officer Wood (photograph reproduced by courtesy of Chev. J. Scicluna archive).

Figure 4. An amphora is held by Able Seaman Meakin watched by (from left to right) Leading Airman Mitchell, Lieutenant Miller and Able Seaman Viney (photograph reproduced by courtesy of Chev. J. Scicluna archive).

These pieces were taken to the otherwise unoccupied Xlendi police cell for safe keeping and Gozo Commissioner Chev. Cassar was duly informed of the discovery. On Monday 19 June 1961 the whole team of divers carried out a sweep across the harbour mouth to Ras il-Bajda, finding more fragments of pottery en route (Martins 1961, 3). There was a concentration of artefacts on the inside of the large reef, the focal point for further exploration. Three dives the next day produced a lead anchor stock, two amphorae and a drinking vessel (Figs 2-5). This precious cargo was shipped to Mġarr for delivery to the Gozo museum.

Word of the discovery soon spread and there were a number of visitors to the site: Dr Tabone (President, Gozo Council), Chev. Cassar, Capt. Charles Zammit (Director, Museums Department), and a TV camera crew from Britain. The following days produced a number of attractive pottery vessels. Touching these artefacts, made with such beauty and functionality, lost so long ago and probably in dire circumstances, fired our imagination. We recovered these treasures albeit without methodically allocating a precise find spot. Smaller objects were manhandled whilst the larger artefacts were tethered to a buoy and later hauled up in a rope cradle, the divers on deck powering the lifting mechanism. This procedure was physically very tiring. Enforced rest after five days of intensive diving provided time for reflection.

Figure 5. Various pottery vessels, an anchor stock and sleeve recovered from Xlendi (photograph by John Wood).

Since antiquity valuable cargoes have been recovered in salvage operations. In Gozo, we were continuing this tradition. In June 1961 we were very much aware of Jacques Cousteau, the pioneer of free diving, and of the work he and his associates were doing to develop method in the nascent discipline of underwater archaeology. Our venture, believed to be the first by an all-British team in the Mediterranean, was undertaken soon after a successful underwater excavation by an American team on the site of a Bronze Age wreck in Turkey.

As Azzopardi has pointed out, '[...] this thrilling discovery was made mere days before the arrival in Malta of another team of divers, this time from Imperial College, London [... who] had set out with the express intention of [...] developing satisfactory techniques for archaeological excavation under the sea. Their achievements were certainly remarkable as their work in Xlendi was carried out at depths that were twice those that were considered safe at the time' (Azzopardi 2006, 20; see also Woods 1962). This timely and generous contribution with professional skills outside our experience ensured the site was properly recorded for posterity. An account

of the work of this latter expedition was due to be published in book form in 2011 by the team leader, John Woods.

Most recently, in 1993 and in 2000 the approaches to Xlendi Bay were surveyed by remotely operated vehicles revealing many more artefacts in depths beyond the scope of SCUBA divers (Grima 1993; Atauz and McManamon 2000). Work in this area was restarted in 2006 by the AURORA Trust and continues to this day.

In Xlendi, posidonia is found practically everywhere in shallow waters. It is particularly dense under the Ras Mahrax reef and inside the shoal bank. In future the posidonia mattes may well yield the most archaeologically informative material. According to Azzopardi, who has studied the material in the Gozo museum and concluded that it ranges from 2500 BC to possibly the 13th century AD, if any ship remains are ever found it will probably be here (Azzopardi 2006, 103, 154).

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Bionote

John Wood was educated at Saint George's preparatory school and Training Ship Mercury. He joined the Royal Navy in 1958 and qualified as a Shallow Water Diver in 1963 and as Ship Diver in 1965. He was a member of a research team doing experimental work on the underwater thermocline for UK Meteorological Office, Malta 1968-1969. He assisted in the Punic ship excavation and reconstruction in Marsala (Sicily) between 1972-1978. He is the author of a number of publications about *pipi tal-qasba*, Maltese folklore, and Maltese migration in Tunisia.

Mapping ancient water management systems

Timmy Gambin

Upon the mention of underwater archaeology one's mind drifts to shipwrecks and sunken cargo lying on the seafloor. There are however other underwater sites besides shipwrecks and some of these sites are not necessarily in the sea. Since 2006, the Department of Classics and Archaeology of the University of Malta together with California Polytechnic (CALPOLY) University from the USA have conducted an innovative project exploring wells, cisterns and water galleries in both Malta and Gozo. This project has a number of aims. Primarily, the intention of this survey is to create a record of the various systems and features used for water management in the past. The second aim (but no less important) is to train computer engineering students in robotics and control engineering. The project co-directors are Dr Timmy Gambin from the University of Malta and Professor Chris Clark from CALPOLY.

In order to achieve these aims the project team organized a number of fieldwork sessions with the intention of allowing the students to learn by doing. Prior to travelling to Malta, participating students were lectured on the islands' history and culture as well on the various technical facets of the project that they would be handling. Local logistics such as access to sites, lodging and transport were taken care of by the Maltese members of team which includes Keith Buhagiar, Malta's leading researcher on ancient water management systems. Such preparations enabled the team to hit the ground running once in Malta. Initially, the main areas of focus were the wells of the ancient walled towns of Mdina and the Citadel in Gozo. The rationale behind the decision to start within the confines of these towns was guided by the possibility of discovering ancient wells and cisterns currently situated in the Baroque palaces, churches and monasteries that are visible today. Guided by the theory that people would have been reluctant to excavate new wells and cisterns the team set out to discover how the past inhabitants would have reutilized extant water features. It was also important to distinguish and document the various ways in which people harvested such a precious resource.

In order to achieve these aims, the team deployed small remotely operated vehicles (ROVs) with an array of sensors including cameras and sonar heads. The former were used to capture visual images of the sites whereas the latter were used to acquire data that could be used in conjunction with mapping software to create site maps and plans. In order to function properly the ROVs needed at least 50 cm of

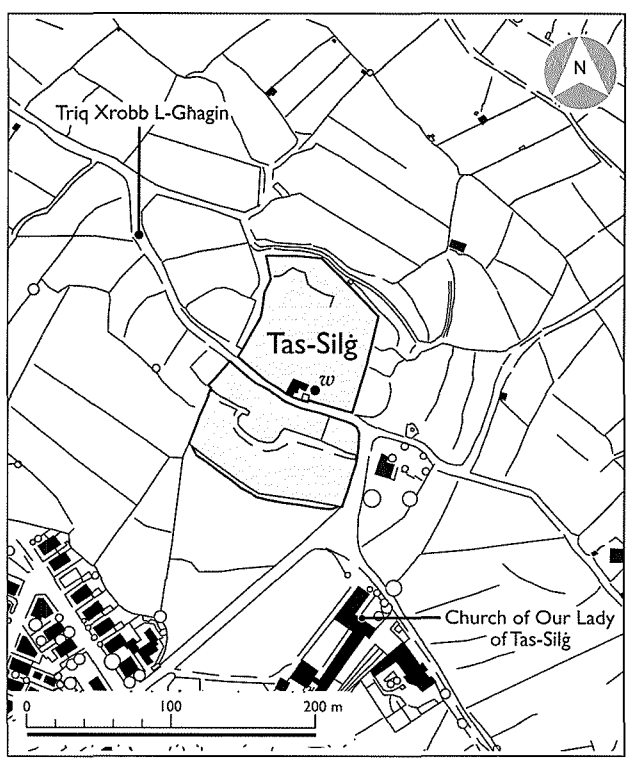

Figure 1. The site of Tas-Silġ. The well explored in the northern enclosure is marked "w" (drawn by Maxine Anastasi).

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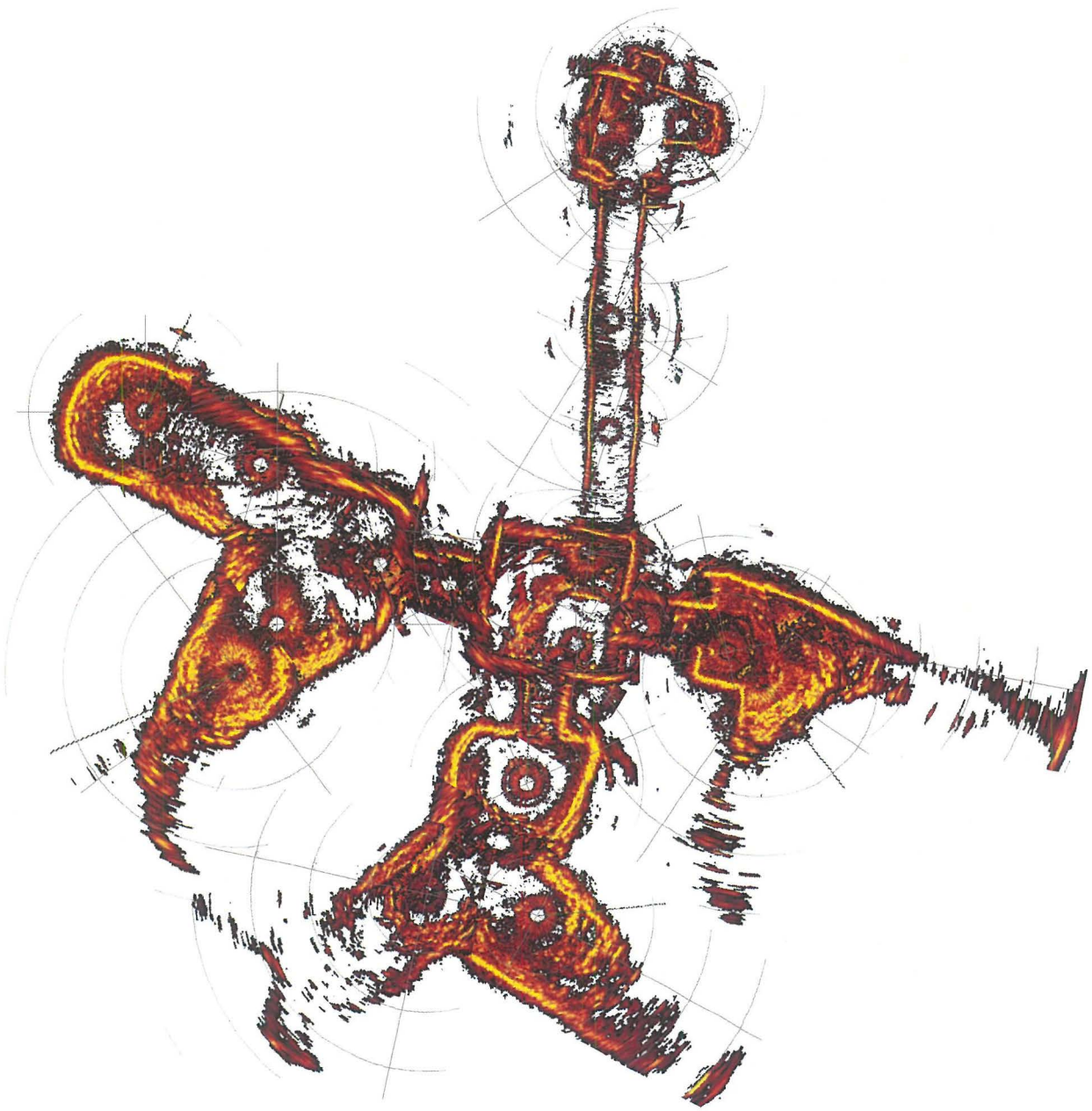

Figure 2. Sonar mosaic of cistern complex under the sanctuary of Tas-Silġ, northern enclosure. Distance between lines = 1m.

water. These small ROVs were best suited for this type of project due to the limited access available through small wellheads. Furthermore, by using robots rather than divers, the risk to humans was limited. Most of the wells and cisterns explored were found to have water and a number of different typologies were recorded. Many traditional bell-shaped cisterns were recorded with some of these connected to others by a series of tunnels. Other premises had deeper wells cut into the rock penetrating the water-table. Of interest is the noticeable way in which shafts have been extended over time, confirming the notion that these water management systems were reutilized by the various occupants of the site.

Apart from Mdina and the Citadel, the team also explored other historic sites, including two in Birgu, where the team surveyed the wells situated inside the Inquisitor's Palace and those of the upper part of Fort St Angelo. Over the past two seasons, we have taken this concept of exploration away from urban centres to include rural sites as well as natural freshwater galleries. Various rural water galleries have been explored and mapped including that at the Carmelite monastery at Tal-Lunzjata in the limits of Rabat whereas in Gozo, the water gallery at Għar Ilma was also mapped and surveyed.

For the first time since the start of this project, the team undertook the survey of a large natural feature. L-Għar ta' Ħarq Ħamiem in Pembroke is a large cave filled with freshwater. Here the team faced new challenges such as the inaccessibility of some parts of the cave. With some good planning and piloting we managed to penetrate deep into this cave and gather essential data for the project. Unfortunately, this unique site is heavily polluted with numerous objects dumped into the main pool.

The last site visited in 2011 provided some of the most interesting results. The sanctuary of Tas-Silġ in Marsaxlokk needs little introduction and the wells of this multi-period site provided an excellent opportunity to use the knowledge we have garnered over the past years. Two wellheads are present and accessible in the northern part of the site (Fig. 1) and an entire day was spent collecting data of the various passages – many of which are intact and still carry water. By stitching sonar images from the various tunnels that could be explored we were able to create a mosaic of what must be one of the best preserved ancient water management systems on the island (Fig. 2).

Over the next two years it is envisioned that the experience and methodologies gained and developed in Malta and Gozo will be 'exported' to Spain and Italy where we will be conducting similar surveys.

A number of public institutions have helped to make this project a success. These include The Superintendence of Cultural heritage, Heritage Malta, The Cathedral Museum (Mdina), The Collegiate of St Paul, and the Water Services Corporation to which the team's gratitude is extended. We are also indebted to the numerous individuals who unselfishly allowed us to 'invade' their homes, businesses and land so as to access the sites. On a personal note, I would like to thank Professors C. Clark, Z. Wood and J. Lehr for their invaluable input into this project. Financial support from the National Science Foundation has ensured the continued success of this project.

Sites can be explored via: http://users.csc.calpoly.edu/~cmclark/MaltaMapping/index.html

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ZAMMIT, M.E. & J. MALLIA (eds) 2008.
Ta' Ħaġrat and Skorba: Ancient Monuments in a Modern World.
130 pp. + CD (catalogue), illustrated. Malta: Heritage Malta. ISBN 978-99932-57-15-8
paperback, not for sale.

My first memories of visiting the Mġarr megalithic temples in 1981 remain with me: locked and barred, overgrown, tumbling stones, no information and no evident public interest. So much has changed over 30 years, and as this timely volume shows, what positive steps are being taken by a new generation of archaeological managers and scholars in delving into all aspects of these important sites and bring them to wider public notice and understanding.

The volume focuses on interdisciplinary studies of two major Maltese temple groups and their surrounding landscapes which have been subject to the Med.Archeo.Sites project. Neither Skorba nor Ta' Ħaġrat represent the grandest or best researched of the great prehistoric monuments of the Maltese islands, but their modest size, relatively well recorded archaeology and distinctive landscape provide a wonderful case-study against which to set into context the conservation and landscape issues of the larger, if more devastated monuments. The volume is organised into three sections, firstly focused on the sites in their context, then the finds, and finally documentation, conservation and management. Ten authors have contributed to the work, with varied and thorough discussions of the different approaches taken.

The study opens with a landscape portrait 'Narrating the Mġarr landscape' (Grima and Vassallo) that assesses the setting of the Mġarr micro-area, reviewing the changing experiences that visitors or residents over time would have seen and felt. The physical topography, viewsheds, sensory and metaphorical characteristics that form what is described as 'The choreography of the landscape' offer an interesting examination and demonstrate how such landscapes are often man-made, bounded, and organised. Place names associated with the landscape add a further dimension that reveal concepts of fertility were projected into names reflecting gardens and springs. The topography is examined against the historical sources, the ancient sites and the natural routes that traverse the landscape showing how the vulnerable 'great rift' valley below Mġarr was successively fortified against invaders.

Zammit examines the archives related to the excavations of Ta' Ħaġrat which took place in the 1920s, showing that there is still much to learn from old records. This careful study reveals the many inconsistencies that often emerge from written notes, diaries and the collective archive, with unclear duration or purpose. However, it also shows that the record of excavation and restoration was reasonably accurate with numerous photographs and drawings that span the many different campaigns under Themistocles Zammit and later John D. Evans and David H. Trump.

Trump, the excavator of Skorba in the 1950s-early 60s, reflects on those excavations and how they came about in the following chapter. The summary of the progress of the work also reveals that the main quest of the project was to establish the chronological relationships of the various stylistic ceramic and building phases, and the importance of these in the two sites, Skorba and Ta' Ħaġrat, in promoting the model of culture change espoused by Trump.

The memories and impressions of Mġarr residents are recorded by Vassallo in 'Tales from Ta' Ħaġrat and Skorba', telling their now largely forgotten story against the archaeological records. From the daily rate of pay to the different tasks of digging and restoration, the experiences of local workmen and volunteers who were involved in the Ta' Ħaġrat work are recorded from the memories of aged observers. Now that the monuments are such prominent cultural landmarks the works and participation in them clearly made deep impressions.

Study of the wider landscape forms the focus of the chapter by Cardona 'Beyond the Temples ...' and shows how modern planning controls attempt to provide safety buffer zones around the major sites. As illustrations and description of maps demonstrate, the micro region of Mġarr is rich in findspots ranging from quarries, to cart-ruts, tombs, and settlement of all periods.

The second section on finds from the sites and area opens with a detailed re-study by Vella on the lithics from early Skorba. The records from the excavation were sufficiently detailed to enable analysis of quantities and materials spatially distributed across the site in various levels. A short summary follows (Borg) on mammalian bone from Skorba that reviews the largely domestic assemblage and lack of wild species, an issue relating to the early economy that

still demands research. Mallia and Zammit review the business of cataloguing the collections from Ta' Ħaġrat, which had the barest of listings following the excavation. Standards of recording and care are now so different, transformed from record cards to accessible digital records, opening up new opportunities to study (and indeed, the CD attached to the back of the volume enables computer access to this remarkable archive).

The final section examines the documentation, conservation and current management of the sites and their materials. The volume is sponsored by Heritage Malta and has been supported by structural funds from the EU, so it is perhaps clear why there is very considerable detail and effort invested in demonstrating the outcome of recent management on the sites in this book. Stroud and Chetcuti consider 'Learning from the past' and the process of making condition assessments of sites. Several different stages are required leading up to the preparation of a Conservation Plan that contains definitions of the site conditions, the scientific methods required to remedy problems, and a five year strategy. For the non-specialist there are useful explanations of why and how all this matters. Applied as the study is, to the ruins of Ta' Ħaġrat and Skorba, the meticulous process is clarified with some excellent photographs to demonstrate the problems, many of which, as the illustrations show, have a long history of restoration, rebuilding and reinvention. The multi-authored chapter 'Setting Limits' brings together many of the issues of modern tourism, damage and site management. Control of visitors and erosion inevitably bring about change, which as photographs show represents gradual destruction of ancient sites. Mallia concludes the volume 'Bridging the gap ... in the 21st century' reviewing how archaeological attitudes in Malta are changing. Digital studies, ground penetrating radar analysis, mapping, survey, and best of all, good conservation methods, are making a difference to this remarkable cultural heritage.

This is a useful volume showing how good practice and professionalism are being applied to ancient places, and we must hope it is the first of many similar studies.

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TANASI, D. & N. C. VELLA (eds) 2011. *Site, Artefacts and Landscape. Prehistoric Borġ in-Nadur, Malta.* [Praehistorica Mediterranea 3] xx + 430 pp. and DVD, illustrated. Monza: Polimetrica. ISBN 978-88-7699-223-0 (Printed edition), €42; ISBN 978-88-7699-224-7 (Electronic edition without the DVD), free from publisher's website.

This publication is essentially a collection of essays, in the book itself referred to as 'chapters', some by single, others by several authors, but arranged in a very logical sequence into four parts, preceded by an introduction by the two editors and followed by two helpful indexes: one of places and one of personal names. Attached to the publication is a DVD containing a fully illustrated catalogue of finds from the early 20th-century excavations of Borġ in-Nadur, and a virtual reconstruction of the megalithic temple on this site carried out by Archeometrica Project of the University of Catania. The book is the third of a series of scientific publications concerned with prehistoric archaeology entitled *Praehistorica Mediterranea*, edited by Professor Pietro Maria Militello. As such, it is an academic publication addressed to the scientific community, both those concerned with teaching and those concerned with the management side of archaeology. This particular volume was funded by The Shelby White – Leon Levy Programme for Archaeological Publications. The printed edition is sold for a price but the electronic edition is available free of charge from the Internet.

The aims of the book are set out in Chapter 1 (the two editors' Introduction), namely, to bring together all that is known about the prehistoric site of Borġ in-Nadur. Its discovery over the centuries and the description of the remains, and their interpretation, as they were revealed by the excavations by Margaret Murray (1921-1927) and by David Trump (1959) take up Part I titled "Antiquarianism and archaeology".

Part II deals with the mobiliary artefacts, that is, all those artefacts that are normally removed from their contexts during the excavation process. They include the pottery, the lithics, and the so-called 'small finds' (that is, anything that does not fall under the other two categories). The prehistoric pottery chapter, understandably enough, takes the lion's share of Part II. Only the artefacts from the megalithic temple of Borġ in-Nadur are catalogued and discussed. The absence of the rest of the material, which is briefly mentioned

in the final 'taking stock' chapter, is attributed by the editors to 'limitations of time' (p. 415).

Part III is dedicated to the interpretation of the site and its setting in the local landscape as well as in the regional landscape, in particular its relations with neighbouring Sicily.

Part IV deals with the management of the site and its surrounding landscape, and the presentation of the Bronze Age in general to the public, mainly in the Permanent Exhibition at the National Museum of Archaeology. Part IV also includes a chapter explaining the background for the virtual 3-D reconstruction of the Borġ in-Nadur temple in the attached DVD.

I shall now deal with some individual chapters. Given the editorial constraints, however, I can only do so with a very limited selection of them.

The most intriguing element I found in Chapter 3, dealing with the excavations at Borġ in-Nadur by Margaret Murray and David Trump, is the discovery of two long globigerina limestone slabs (fig. 3.1) because, as far as I know, nothing like them has ever been found elsewhere, and the 'massive masonry structure' discovered in 1998 (fig. 3.2) on the south edge of the ridge, which is thought to be part of the same line of Bronze Age fortification as the D-shaped bastion on the north end (pp. 46-47). Close to the latter a 1m-thick layer was identified as of *Tarxien Cemetery* date, thus confirming the occupation of the ridge by a settlement already in this earlier phase, as established by the pottery from the excavations of both Murray and Trump. This is not to mention the presence of two silo-pits recorded for the first time within the wall perimeter.

Chapter 4 presents a discussion of the pottery from the excavations of the Borġ in-Nadur temple by Margaret Murray, accompanied by excellent, sharp and clear drawings and pie-charts and histograms illustrating percentage distributions of pottery styles of different phases, and of different fabrics within each phase.

Apart from a catalogue of the surviving 'small finds', Chapter 7 provides a tabulated list of missing objects on p. 200. Among the stone objects one comes across some odd identifications made by Murray, which the contributor makes no effort to explain. The two so-called 'trapdoors', for example, appear to be stone-plugs normally associated with u-shaped perforations in the ground. My interest in figurative finds is well known, but I found little, if anything, that excites me in the small collection (5 in number) of what has been termed as 'figurative sculpture'. Of these the 'betyls/phalluses' are, unlike the cited parallels, very subjective interpretations.

Very innovative, in my view, is Chapter 8 in which the two authors apply new, state-of-the-art GIS technology in the study of the topography, connectivity and use of the two ridges on which two archaeological sites of fundamental importance are situated, that is, Borġ in-Nadur and Tas-Silġ. Their investigation follows a chronological trajectory from early Neolithic down to late Roman and, in the process, embraces other sites on the hinterland extension of the same ridges, such as the Ta' Kaċċatura and Żejtun Roman villas. The authors first trace a fascinating parallel life-history of the two ridges, which start to diverge precisely during the Borġ in-Nadur phase, at first only in terms of scale of activity, to completely change their role in the Punic and Roman ages. Then, after applying different Cost Surface Analyses to identify the most cost effective paths of access and activity between different points, they map out the likeliest routes between the hinterland and different embarkation points, and vice-versa, to fit in the religious and profane sites on these routes.

In a short chapter at the end the editors round up the monograph by taking stock of the situation regarding Borġ in-Nadur and its immediate landscape, as well as other Bronze Age sites, making sensible suggestions for future research on the subject.

In general the book is written in very good and flowing English, with the occasional Italian idiosyncrasy adding that little bit of colour. Apart from very small sections that are fraught with technical, non-archaeological, jargon the rest makes for easy and enjoyable reading. I have noted relatively few misprints. The worst misprint is in the running head of chapter 10 which is rendered incomprehensible by the wrong position of the colon. It seems that Chapter 9 was shifted to eleventh position at some stage, without the respective cross-references being adjusted accordingly.

We have here a magnificent reference work and a new point of departure for deeper studies on all that relates to this site, the result of a perfect synergy between colleagues. When I look at the long lists of bibliographical references I am impressed by the amount of international scholarship that was tapped by this collection of essays.

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SKEATES, R. 2010. *An Archaeology of the Senses: Prehistoric Malta.*
xiv + 287 pp., illustrated. Oxford: Oxford University Press. ISBN978-0-19-921660-4. £83.

Over the past three decades, approaches to prehistory that are primarily focused on chronological and typological considerations have gradually ceded more ground to concerns with reconstructing past human experience, to provide narratives that are more holistic and often more personal. This shift to a wider exploration of human experience has brought in its wake a growing realisation that archaeological discourse has often been tightly circumscribed by the visual, at the cost of other sensory experience. The need for more multi-sensory approaches to the past in order to redress this imbalance has been widely recognised, and a growing body of empirical work is beginning to address this need.

Against this backdrop, Skeates's volume sets out with a twofold agenda. One goal is to hammer out a systematic approach to multi-sensory archaeology, grappling with the theoretical and methodological issues that it raises. The second is to offer a new account of Maltese prehistory, which explores the full breadth of multi-sensory experience. These two strands of the argument are of course closely intertwined. The theoretical and methodological issues prepare the ground to explore the Maltese evidence afresh, while the Maltese prehistoric scenario serves as a case study to showcase the potential of the multi-sensory approaches that are brought to bear. In the process, both goals are achieved with great aplomb.

The first chapter offers a comprehensive and interdisciplinary review and discussion of the genesis and application of multi-sensory approaches across archaeology and kindred disciplines. This is followed in chapter two by a fresh look at the evolution of ideas and attitudes surrounding prehistoric remains in Malta since Gian Francesco Abela's *Della descrittione di Malta* (1647). Here Skeates brings to bear his extensive knowledge of the historical context in which antiquarianism and archaeology emerged in Europe since the early modern period. The connecting strand of this particular historiographic narrative, which lends it more originality as well as relevance, is that it is presented as an account of the changing attitudes to sensory experience over the past four centuries.

Having laid the stage, in historical as well as theoretical terms, the author then proceeds in the following four chapters to address different dimensions of sensory experience in Maltese prehistory, starting from the insular context, then proceeding through the experience of daily life, built monuments, and underground environments. The chronological sweep of the narrative takes us from the arrival of the earliest known settlers in the late sixth millennium BC, to the establishment of the Phoenicians on the islands in the late eighth century BC.

One of the great strengths of the work is the author's thorough command of the different bodies of literature that he deftly intertwines within the narrative. He is equally at ease when marshalling the work of philosophers, perceptual psychologists, anthropologists, and historians to make the theoretical case underpinning his approach, as he is when weaving together historical sources to reconstruct changing attitudes to Maltese prehistoric remains over the past four centuries. Obscure sources are summoned and cited alongside more familiar ones, to provide a narrative that is encyclopedic as well as immensely readable. Typographic errors are few and far between ('Bonello 1966' for 'Bonello 1996' on p. 41; 'Manjdra' for 'Mnajdra' on p. 52; '1820-1' for '1920-1' on p. 54).

In giving a thorough assessment of the current state of play in multi-sensory approaches to archaeology, Skeates also allows us to experience some of its limitations and frustrations. One device pioneered by other archaeologists and adopted by the author (2010, 7) is creative writing. Short sections of the book, printed in italics to distinguish them from main text, provide vignettes of prehistoric life. While informed by and compatible with the recognized archaeological evidence, these descriptions remain largely imaginary. And here lies the rub. When we flesh out the bare bones of the archaeological evidence to produce a more pleasing narrative which allows us imaginary insights into the viewpoints and values of the prehistoric inhabitants, the ice beneath our feet becomes proverbially thin. The risk is that we project our own expectations of what these attitudes, values,

and emotions should be, and in the process overlook precisely those attitudes and values which are most alien and inconceivable to our minds. In the imaginary description of a Żebbuġ Phase burial, for instance, we are told that the elders entering the tomb '... struggle to overcome their sense of disgust and aversion ...' (2010, 222-23), flying in the face of the explanation, succinctly given in chapter one (2010, 15-16), that smell is culturally embedded. It would be rather more interesting to leave open the possibility that the response was something other than the 'disgust and aversion' we expect with our modern mind.

These are minor quibbles however, which in no way detract from the value of this work, which offers a double bonanza to anyone interested in Maltese prehistory and in emerging methodological approaches to archaeology more generally. Skeates's contribution is an invaluable reference work for anyone engaging with the problem of what we can reconstruct of past human experience, and no less importantly, what cannot be reconstructed from archaeological evidence alone.

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SAGONA, C. (ed.) 2011. *Ceramics of the Phoenician-Punic World: Collected Essays.*
[Ancient Near Eastern Studies, Supplement 36]
x + 450 pp., illustrated Leuven: Peeters.
ISBN 978-90-429-2379-9. €95.

The book under review here is a collection of eight papers, some of which were presented at a four-day workshop held in Valletta, Malta, in January 2007, co-organised by the Department of Classics and Archaeology, University of Malta, Heritage Malta, and the Superintendence of Cultural Heritage, Malta. Claudia Sagona, together with several eminent scholars and researchers, gathered to present new research about various aspects of Phoenician and Punic ceramics. The aim of the workshop and subsequently that of this volume was generally very broad: it aimed to highlight some key features of pottery manufacture and use in the regions occupied by Phoenician/Punic settlers (p. 4). The first two papers deal with Phoenician pottery from Beirut and Tyre, respectively. These are followed by three papers that discuss Phoenician and Punic pottery from three North African settlements (Lixus, Utica and Carthage). The remaining three papers deal exclusively with Malta.

Jamieson's contribution is the first, and longest, section (pp. 7-276), taking up half of the pages of the volume. He discusses and describes pottery from well-stratified Iron Age contexts from Beirut (pp. 7-8). Jamieson's piece is rather awkward and report-like in this volume. The chapter's lengthy catalogue of fabric (pp. 13-29) and shape (pp. 30-104) classifications resembles more a significant part of an excavation report than a research paper attempting to answer a specific question. However, this has been noted by both the editor (p. 2) and Jamieson (p. 11) and it is interesting to observe that it was included in order to hasten the process of publishing and circulating important new ceramic data – highly admirable, considering that most ceramic reports take many years to publish! Additionally, the Tell Beirut Iron Age pottery sequence is one of the few well-stratified ceramic studies from the Phoenician homeland, new data of significant importance that is a vital addition to the Phoenician pottery chronologies from Tyre and Sarepta (p. 8).

The remaining papers are shorter and aim to answer a specific research question. Núñez Calvo tackles some social and economic aspects of a standardised repertoire of local and imported pottery vessels from the Phoenician cemetery of Tyre-al Bass (pp. 277-96). Aranegui, Lópex-Bertran and Vives-Ferrándiz's paper (pp. 297-326) presents a concise description of some of the main pottery shapes identified in the earliest levels of a midden context from two excavated areas in ancient Lixus, in modern-day Laranche, Morocco (pp. 302-14). They later discuss the question of initial contact between the first Phoenician settlers and indigenous or pre-existing communities in the area (pp. 316-20). Of particular interest here is the contribution they make to the on-going discussion on the appearance of handmade pottery alongside wheelmade shapes in the earliest western Phoenician levels. This practice is not unique to Lixus but is found at several other western Mediterranean sites of early Phoenician date (see Vella *et al.* 2011, 268-69). Aranegui *et al.* opt not to explain the mixed assemblages by ascribing each technological difference to a different

ethnicity. Instead, the authors explore the possibility of a collaboration between different cultural groups, which include the Phoenicians, as they join together to make a new social group adopting and adapting various cultural and social practices (p. 320).

Maraoui Telmini and Bouhlel summarise the results of petrographic analyses of locally manufactured middle to late Punic pottery from Carthage and Utica (pp. 327-47). Errors in the formatting of some images and accompanying captions (i.e., figs 5-7) may, however, confuse the reader who might attempt to compare the fabrics against similar examples. Mansel examines a group of mid-7th-century BC pottery from a domestic context in Carthage (pp. 349-72). By dividing up the ceramic forms according to pre-defined functional groups, Mansel attempts to quantify the frequency of particular household activities such as eating and drinking, cooking and storage (p. 351).

The remaining three papers deal exclusively with the Maltese islands and will be of particular interest to the readers of this journal: Giulia Recchia and Alberto Cazzella whet our appetites with references to the research and studies that are currently being undertaken by Italian archaeologists at the sanctuary of Tas-Silġ, where excavations were resumed in 2003 with the specific aim of investigating the prehistoric remains to the north of the site (p. 374). The significance of some newly excavated strata is forecast to help review and fine-tune Trump's and Evans's chronology for the transition between the Late Neolithic (Tarxien phase) and Early/Final Bronze Age (Borġ in-Nadur/Baħrija phases) of the Maltese islands (p. 375). Despite contributing little to the discussion of Phoenician and Punic pottery *per se*, this paper does discuss some pertinent points regarding the current debate surrounding the Maltese Bronze Age chronology. This acts as a prelude to Sagona's paper (pp. 397-432), which tries to trace the elusive transition between the end of the Bronze Age and the arrival of the first Phoenicians in Malta, singling out morphologically and technically similar traits between the two periods. Sagona's paper picks up on an earlier attempt to revise the dating of a Bronze Age ceramic assemblage based on a re-interpretation of Trump's excavations at Borg in-Nadur in 1959 (Trump 1961, Sagona 2008, 490-93). Her views are based on a re-reading of the stratigraphy of the excavation of Huts 1 and 2 at Borġ in-Nadur. Recchia and Cazzella acknowledge that Trump's stratigraphy may be problematic but disagree with Sagona's final conclusion on the matter (p. 388). Since the book under review has been published, the doubts expressed on Trump's stratigraphy have been put to rest (see Vella *et al.* 2011, 64-66).

Lastly, Quercia presents a partially revised version of the typology of standard Punic plates, cups and bowls at Tas-Silġ (pp. 433-50). Apart from being a welcome English translation to an important earlier paper (Quercia 2007), an additional category – bowls (pp. 442-43) – is discussed in some detail. Here, however, it would have been helpful to include figures of the bowl types he discusses, as none are provided here, or in the earlier version.

Despite the high price tag of this book, anyone interested in early Phoenician and Punic ceramics will find the contributions in this collection of essays useful to their research.

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Vella, N.C., D. Tanasi & M. Anastasi. 2011. Mobility and transitions: the south-central Mediterranean on the eve of history, in D. Tanasi & N.C. Vella (eds) *Site, Artefacts and Landscapes: Prehistoric Borġ in-Nadur, Malta*: 251-81. Monza: Polimetrica.

Vella, N.C., M. Zammit & A. Bugeja. 2011. Borġ in-Nadur: The excavations of Margaret A. Murray and David H. Trump, in D. Tanasi & N.C. Vella (eds) *Site, Artefacts and Landscapes: Prehistoric Borġ in-Nadur, Malta*: 45-67. Monza: Polimetrica.

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VELLA, G., N. SAGONA & J. CREMONA 2011.
The Ġgantija Temples. A History of its Visitors and Views.
48 pp., illustrated. Malta: Heritage Malta.
ISBN: 978-99957-0-046-1. €10.

In the absence of photographs, other media such as prints, drawings and engravings turn out to be an important record of archaeological sites, proving indispensable for research, serving as primary documents for conservators as well as recording contemporary attitudes and artistic treatment of the sites depicted. The book being reviewed here is a publication that studies such media and was published following an exhibition of early nineteenth century illustrations of the Ġgantija temples organized by Heritage Malta in the Gozo Area exhibition Hall in the Citadel between 27 May and 23 July 2011. Provision of a more permanent record of what was exhibited makes up for the fact that the book consists of only 48 pages and contains just three articles.

Half of the book is taken up by a study of five related sets of illustrations of the Ġgantija temples. In this article Vella reappraises the early nineteenth century history of the megalithic site and argues that the illustrations are souvenir drawings intended for travellers to Ġgantija. The two most detailed, almost identical, sets which adhere to a corresponding scale and feature analogous paper sheets and calligraphy are considered as the original 'first generation sets', while the other sets with less detail are deemed as copies of 'second generation'. Although the manuscript catalogue of the National Library ascribes its set to Filippo Vassallo, Vella challenges such attributions and hints at Clemente Busuttil as the probable author.

Vella's arguments on the relative chronology of the different sets are largely valid, even though using the same principles the centre left drawing with measurements of Ġgantija on p. 11 should be considered as earlier than the first generation copies. The conclusion that Filippo Vassallo is not the painter of one of the sets appears plausible; this is supported by the attribution of Ġgantija to the Druids in the caption to one of the drawings (p. 11), an attribution prevalent in the first half of nineteenth century Malta and much rarer later.

Placed in a wider context and on a more firm evidence base, one may say that the set of nine drawings known to have belonged to John Hookham Frere (Fergusson 1872, 417) appears to be different from the ones under study because of a different treatment of the rear view of the temples. Furthermore, although Vella notes that Didot modelled his drawings on the five sets under study, one should not lose sight of the fact that Didot (Lacroix 1842, 54) claims to have surveyed the site, a statement that is collaborated by the different measurements appearing on the respective plans of Ġgantija. By 1830, views of Ġgantija were already on sale near Pullicino's (probably Giorgio) study in Valletta (Pericciuoli Borzesi 1830, 30). These details, as well as the Brochtorff watercolours, should illustrate the fact that many painters were drawing the Ġgantija temples in the first half of the nineteenth century. Thus attributing one set to a painter rather than to another is risky in cases of unauthenticated drawings. Indeed, against this background, I believe that the proposed attribution of the sets to Clemente Busuttil made by Vella should be treated with caution, particularly in view of the fact that in four authenticated drawings of Ġgantija by Busuttil (Debono & Scicluna 2010, 108) a different calligraphy for the captions and a different unit of measurement is used from the ones published by Vella. Irrespective of this opinion, Vella's article will remain an indispensible source for anyone studying Ġgantija and the history of the megalithic temples.

Despite recent publications on visitors to Ġgantija, such as those of Bonello (1996, 19-29) and Attard Tabone (1999, 161-89), Nicoline Sagona is bold enough to come up with yet another account on the subject. The first part of her article turns out to be a summary of what has already been published but later on contributes to the theme by reproducing two illustrations and a comment on architect Le Corbusier's visit to Ġgantija. Taken in a wider context, Sagona's work is probably indicative that more new material on visitors and illustrators to the megalithic temples is likely to emerge by a comprehensive listing and study of the illustrations in the holdings of Heritage Malta and attention to twentieth century visitors, painters and photographers.

John Cremona digs deep within his collection and consults material amassed through personal research to come up with an article on Ġgantija in print. Although his article is restricted to nineteenth century prints, he puts before the reader important previously unknown material such as the presence of two different versions of Plate 4 for Mazzara's work, a lithographic print of the well-known Charles de Brochtorff drawings of Ġgantija and an engraving of a hunting scene for the same site. His article reminds

us that private collections remain an important source of information for archaeology, and the decision to make such material available for study to the public is at least commendable and to be encouraged.

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NOTES FOR CONTRIBUTORS

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