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Placing and remembering the dead in late Neolithic Malta: bioarchaeological and spatial analysis of the Xaghra Circle Hypogeum, Gozo

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ABSTRACT
This paper integrates the results of recent bioarchaeological and spatial analyses at one of the largest collective burial sites in Europe, the Xaghra Circle Hypogeum on Gozo. This suite of new approaches has addressed demography, funerary practices, interactions with the dead, and the changing use of space. Modelling structural events and reconstructing funerary practices from 2900 to 2350 cal BC, we trace persistent variation and flexibility in the use of space over time. Taphonomic analysis shows that young individuals (from foetal age and above) were included within the burial space, and their depositions occasionally informed subsequent interments. Such results resonate beyond this site and enhance our understanding of society in third millennium BC Malta. We advance a model of broad accessibility to the burial space, strengthening emerging narratives of heterarchical social dynamics in the Maltese islands.

Introduction
 Collective burials, assembling large numbers of the dead over an extended time, emerged as a striking new tradition in the European Neolithic and Copper Age, hand-in-hand with the spread of megalithic monuments along the Atlantic façade and into the Mediterranean from 4500 cal BC (Schulz Paulsson 2017, 2019). In central and southern Italy and the central Mediterranean islands, underground and natural spaces such as caves, rock-cut tombs and hypogea, were primarily utilized for burial (Guilaine 2015; Whitehouse 1972, 1992). For two millennia, monumental tombs connected communities to significant places through the enduring presence of the dead. These monumental forms witnessed a range of funerary practices and were frequently revisited over at least several generations. Typically, most individuals were deposited soon after death and successive practices ensured the dead were broken down into their constituent parts in ways which emphasized the fluid boundaries of the body. While collective burials brought people together in death, they also provided a space where bodies could be dispersed and new relations and associations formed through customs such as bone curation, removal, and secondary deposition. This complex mixture
of practices has often impeded detailed analyses, particularly the temporality of burial and structural events.

On the Maltese islands, collective burial is a feature of the late Neolithic ‘Temple period’, from 4100 to 2300 cal BC, contemporary with the Final Neolithic in Sicily and peninsular Italy. This period encompasses five cultural phases, initiated with the Żebbuġ (4100–3800 cal BC) and ending with the Tarxien (2900–2350 cal BC), during which time burial sites diversified from small single rock-cut tombs to clusters of tombs, caves, and large hypogea (interconnecting underground cave systems). Of the three known hypogea – Ħal Saflieni, Santa Lucija and the Xagħra Circle – only the latter has been carefully excavated and recorded, providing the opportunity for bioarchaeological and spatial analyses.

The Xagħra Circle is one of the largest known prehistoric burial sites in Europe, yet it is frequently overlooked in archaeological and bioarchaeological scholarship (e.g. Martin, Harrod, and Pérez 2013, 118). The site comprises an encircling megalithic wall (now mostly destroyed) containing a rock-cut tomb and a large hypogeum. Excavations (1987–1994) revealed the remains of at least 800 individuals from largely disarticulated and commingled deposits (Malone et al. 2009). Re-visiting the archive and the excavated material under the aegis of the ERC-funded FRAGSUS project (2013–2018), a suite of techniques has been employed, including Geographic Information Systems (GIS), 3D virtual approximation, palaeopathological analysis, taphonomic analysis, dental anthropology, long bone cross-sectional geometry, isotopic analyses, radiocarbon dating, and aDNA. These significantly enhance our knowledge of the site’s use over time, the sequence and range of funerary practices, the changing demography of the burial population, and the lived experiences of those interred in the hypogeum. Altogether, the results have implications beyond this single site, providing new avenues for thinking about population dynamics, mobility, and social organization.

In this paper, we unite detailed chronology, spatial analysis, virtual approximation of the hypogeum, and taphonomic analysis of funerary practices, to develop prior narratives of the use of the burial space and their implications for social relations. Subsequently, it is possible to account for the human dimension at the level of single individuals and address diachronic changes in the use of space and funerary practices. For the first time, the site as it would have looked while in use has been reconstructed, allowing us to explore visibility throughout the hypogeum and examine choices in the use of each burial space. Integrating these results, the tension between prescription and flexibility in space-making is highlighted. The diversity of funerary practices, which are not strongly correlated with either discrete spaces or periods of time, may alter narratives surrounding the community/ies accessing the site, previously put forward by two of us (Stoddart and Malone 2015). Significantly, the inclusion of young individuals in the burial space, and their integration into all stages of the post-depositional process, considerably enhances our understanding of the both the hypogeum and the structure of society in third millennium BC Malta.

**Remembering and belonging**

The role of memory and the degree of social inclusion in burial spaces are key themes pervading death studies from early prehistory to the present. The ways in which the dead are materialized by the living can reveal cultural technologies of remembrance. Memory is often inscribed on, or processed through, bodies via movement, habitual actions, and encounters with materials which frame past experiences (Bergson [1908] 1991; Connerton 1989; Jones 2007). In this way, there is little separating Neolithic traditions of curating ancient bones from the tradition of wearing mourning jewellery in the Victorian period – both provide tangible, sensuous and emotive engagements with
the remains of deceased persons, linking individuals across generations. Furthermore, the members of the population admitted into burial spaces, and their spatial organization, can illustrate structuring principles in society, including social, economic and religious factors.

Concerns regarding the relationship between funerary spaces, practices, memory and societal structure have pervaded archaeological discourse on Neolithic Europe for several decades. Indications of a structured use of space and long histories of burial within monuments has led to much research on the mechanisms by which bonds with the dead were severed or maintained, and the extent to which the burial population reflected the living community (e.g. Alt et al. 2016; Aranda Jiménez et al. 2018; Bayliss and Whittle 2007; Schulting et al. 2010). Early Neolithic British burial monuments, in use for several generations, may convincingly be argued as places of commemoration, although the highly fragmented remains they contain are variously perceived as reflecting intentional disintegration (Shanks and Tilley 1982) and carefully articulated relations of remembrance (Jones 2005). Their demographic is often selective, with few non-adults, and more males than females (Smith and Brickley 2009, 88). By contrast, disarticulating and defleshing the dead during the Middle Neolithic at Scaloria Cave (Italy) is argued to represent careful and embodied processes which brought closure to mourning (Robb et al. 2015). The range of funerary practices attested across the Neolithic is vast. Existing and emerging taphonomic studies provide the ability to examine the variety and sequence of depositional modes within sites and across regions. From these, the impression gained is one of diversity, and it is often difficult to define a predominant funerary tradition.

**Spaces of the dead in Neolithic Malta**

Many Neolithic burial sites identified on the Maltese islands ([Figure 1](#)) were excavated by antiquarians who were primarily interested in material culture, at the expense of recording and recovering skeletal remains. Minimal information provided from early excavations suggests that most rock-cut tombs contained relatively few individuals (c. 2–12) (Evans 1971). However, many were disturbed by looting and agricultural activity, and it is probable that fragmentary remains were often overlooked when assessing the burial population. Within the larger caves and hypogea, the burial population was much greater, ranging from at least 45 individuals in Bur Mgħez cave (Zammit 1925b) to 822 individuals in the Xagħra Circle hypogeum (Stoddart et al. 2009a). More recently, excavations at the Xemxija tombs, Xagħra Circle complex, and Kerċem tomb have demonstrated that burial spaces were continually re-used and the remains of the dead extensively manipulated, due to a combination of the clearance of previous burials and intentional cultural acts (Evans 1971; Malone et al. 2009; Stoddart, Wysocki, and Burgess 1999). At all sites, the (often disarticulated) human remains were commingled with faunal remains and material culture, including ceramics, worked flint, figurines, and items of personal adornment.

Burial sites are often spatially associated with ‘temples’ (see [Figure 1](#)), linking places where the living gathered for communal rituals and feasts (Barratt et al. 2018; Malone 2018) with spaces for the dead. Rock-cut tombs and temple apses present similar forms: both are usually circular or ovoid in shape, and larger multi-lobed rock-cut tombs resemble the arrangement of apses within a temple. Both have been viewed as representing increased sophistication over time, perhaps reflecting greater social stratification or complexity (Evans 1959). The close relationship between these monuments is further indicated through similarities in the use of space and architectural features (Malone 2007; Stoddart and Malone 2010). The trilithon arrangement of monoliths in the temples is reflected in the carving of the ‘holy of holies’ at the Hal Saffieni hypogeum, and the placement of stone screens, shelving and a large stone bowl in the Xagħra Circle hypogeum parallels the furnishings used in temples. Finally, progression is inferred from public, secular activities in the outer apses of temples, to
secluded ritual activities within the inner spaces, suggesting increased exclusivity as one moves through the monuments (Anderson and Stoddart 2007; Evans 1996; Turnbull 2002).

Such a ‘filtering’ effect has likewise been argued for spatial organization within the Xaghra Circle Hypogeum. Articulated adult males initiated the sequence of deposition in several locations, leading to the suggestion that burial was restricted based on distinctions in social standing and identity, reflecting emergent hierarchy in the third millennium BC (Bonanno 1996a; Stoddart and Malone 2015). As a result, it was suggested that access to the deeper, inner recesses of the burial space seems to have been denied to some individuals, most notably children (Malone and Stoddart 2009, 366). However, of the excavated population, the ratio of male and female individuals in the Xaghra Circle is not significantly different (94:71) and individuals from foetal age and above are represented, with non-adults accounting for 44% of the total MNI1 (Stoddart et al. 2009a, 321). Earlier syntheses thus particularly highlighted the burial position and role of male adults, overlooking female individuals and non-adults, despite their presence in the burial space.

The Xaghra Circle complex

The Xaghra Circle is located on the southern edge of the Xaghra plateau on Gozo, between the Ġgantija and Santa Verna ‘temples’. The Xaghra Circle complex contains two distinct burial spaces,
dating from different phases of the late Neolithic, contained within an enclosing megalithic wall. At the southeast edge of the site is a rock-cut tomb comprising two chambers accessed by a central shaft, used in the Ġgantija period between 3600 and 3300 cal BC (Malone et al. 1995, 2019). Following a hiatus in use, the hypogeum was constructed and a threshold of megalithic paving slabs leading into the complex were constructed in the Tarxien phase, by 2900 cal BC (Malone et al. 2019). The hypogeum includes architecturally distinct zones within the East and West Caves, joined by a central area (the 'Shrine') containing megalithic furnishings (Figure 2). When partially excavated between 1989 and 1994, at least 220,000 human bones and bone fragments were found clustered throughout the hypogeum, often disarticulated and commingled with animal remains, pottery, and

Figure 2. Map of the Xagħra Circle hypogeum, demonstrating the density of burials within the East and West Caves.
small items of figurative art (Stoddart et al. 2009a). Radiocarbon dating and Bayesian modelling reveals that burial within the hypogeum lasted some 600 years (Malone et al. 2019). The density of radiocarbon dates is at a maximum around 2600–2500 cal BC, suggesting that peak activity occurred in the mid-third millennium BC, after which burial declined steadily and ended by 2350 cal BC (Parkinson et al. Forthcoming).

The site was excavated in spits (usually around 10 cm in depth) on a 1 × 1 m grid. All deposits of skeletal remains were described as either ‘random’, ‘articulated’, ‘structured’, ‘intact’ or ‘broken’ and, where possible, drawn to scale. Subsequent analyses provided a full bioarchaeological analysis of select articulated individuals and investigated intra-site redistribution through quantifying the representation of skeletal elements within each context (Stoddart et al. 2009a). Recent large-scale taphonomic analysis, incorporating 9–100% of the fragments from 16 contexts, has considered the size, preservation, condition, and modification of even highly fragmented remains (Thompson et al. Forthcoming). Standard methods were applied to assess bone completeness, weathering, abrasion, fragmentation morphology, animal damage, burning, and cutmarks (see Knüsel and Robb 2016). Anatomical connections and articulations were examined post-exavagation through reference to field notes, photographs, and plan drawings, implementing principles from archaeothanatology regarding the timing of disarticulation at various articular regions (Duday 2009). Accounting for the relative presence of skeletal elements (following Dodson and Wexlar 1979), modes of deposition within key areas of the site have been categorized according to expectations regarding the differential preservation of skeletal elements (Robb 2016). Striking variation was observed, including undisturbed primary interments, primary interments which were subsequently disturbed, and secondary deposits of largely disarticulated bone.

Recent work has availed of modern geographic information systems (GIS) to digitize the original drawn excavation records of each 1 × 1 m spit, facilitating analysis of the burial space throughout time, as well as the relationship between skeletal remains and structural features. Other data, such as the location of pathological elements, and the findspots of important artefacts, can be formally compared to the distribution of human remains using the same GIS. Where possible, skeletal elements on plan drawings have been related to the remains analysed in the laboratory. The intra-site GIS, alongside excavation notes and photographs, also facilitated construction of a 3D model of the site, which presents the hypogeum at its peak during the Tarxien phase (Barratt 2016). This allows for perspectives on the skeletal assemblages that have been impossible to achieve before, such as the identification of ‘new’ cases of articulation across adjacent grid squares, and the overall density of burials plotted in 3D space.

**Spatial analysis, structural features and movement**

Commingled human bones are highly fluid deposits which are susceptible to a wide variety of processes, both deliberate and unintentional, over long periods of time, and therefore can act as important records of anthropogenic activity. At Xaghra, the burial deposits held a secondary function as structural deposits, with the density of commingled bone providing detailed insights into site formation processes, remodelling events, and patterns of funerary activity within the hypogeum. GIS analysis has concentrated on two central areas of the site that were almost fully excavated, the ‘Shrine’ area and the ‘Display’ zone. Located at the juncture between the East and West Caves, the Shrine was one of the few areas which yielded a continuous burial stratigraphy spanning four large deposits (1328, 1268, 1206 and 960) and was the location of a number of
architectural features, including an enclosing megalithic screen and a large stone bowl, that appear to have been central to the creation of space within the hypogeum.

The spatial distribution and density of commingled human bone revealed several remodelling events within the Shrine throughout the third millennium BC. Burial was initiated in the early Tarxien phase (2895–2855 cal BC (74%), see Malone et al. 2019) in the form of foundational burials on the natural bedrock (context 1328, Figure 3(a)), and was followed by an expansion of burial activity across the entire Shrine (context 1268, Figure 3(b)). Context 1268 was then cut into for the placement of a megalith, as part of the initial construction of the enclosing megalithic screen, marking the first remodelling event within the area. Contraction of burial activity around the stone bowl indicates that subsequent burial deposits (context 1206; Figure 3(c)) built up within the area demarcated by the megalithic screen. A crude proxy of overall burial intensity can be obtained from the temporal distribution of 74 radiocarbon dates obtained from loose teeth. Using kernel density estimation and bootstrapping techniques (McLaughlin 2019), there was a period of intense activity and rapid accumulation of burials in the mid-third millennium BC (Figure 4). A second expansion of burial activity across the Shrine engulfed the surrounding architectural features (context 960; Figure 3(d)). Further remodelling occurred during this phase, as evidenced by a gully between the uprights of the eastern internal megalith screen (M955 and M914). Greater density of burial activity within the eastern-northern aspects of 960 (Figure 3(d)) suggests that although the megalithic screen was engulfed, it was still a part of the symbolic fabric of the site and the space within it continued to be respected.

Visibility analysis, utilizing raycasting and solid collision features in gaming software, was used to determine the visibility of a part of the site from the rest of the cave system (Barratt 2016). The Shrine area is highly visible without the screen, but only partially visible when the screen is in place. The megalithic screens placed around this zone would have greatly impeded movement and visibility, creating a carefully constructed space. In particular, the gully between M955 and M914 suggests that a megalithic screen may have been placed and removed multiple times. Visibility analysis shows that the alternate placement of this megalithic screen would have drastically modified the visibility of the site (Figure 5). The East Cave became hidden away, and a corridor of visibility that ran from the entrance area to the Southeast corner was blocked off. The intentional creation of secret and unseen space may represent a change in ritual practices. Alternatively, the collapse of the roof of the East Cave may have necessitated a reconfiguration of space within the hypogeum, concealing space that was no longer in use. A series of inhumations in pits in the East Cave roof have been dated to the 25th century cal BC (Malone et al. 2019), placing the roof collapse in the late Tarxien phase towards the end of the site’s use. In contrast to the control of visibility and creation of concealed space within the Shrine area, sight was also significant in the Display zone, where the lack of obstacles and its central position contributed to its high visibility.

A 3D approximation of the site also facilitates phenomenological exploration (Figure 5). The model includes excavated standing features and recreates an estimation of the roof based on the height of the supporting pillars. While the original extent is uncertain, layers of roof collapse uncovered during excavation were used as a guide. The role of light and dark in funerary and ritual spaces has been widely discussed (Skeates 2016; Whitehouse 1992), and within the context of Malta has been used to identify the importance of manipulating space and light to construct ritual (Stoddart et al. 2019). While the site today is open, light, and allows for movement, the recreation of the collapsed roof demonstrates that this would have rendered the hypogeum very dark, with natural sunlight blocked by the many screens and walls. Additionally, movement was limited, as the low roof combined with deep burial deposits would have required people to crouch in some places.
Narrow passages and uneven ground, including occasionally walking directly on bone, would have contributed to the difficult exploration of the cave system.

Figure 3. Density of burial activity in the Shrine area throughout its use, from its foundation in context 1328 (a), expansion with context 1268 (b), contraction with context 1206 (c), and final expansion in context 960 (d).

Narrow passages and uneven ground, including occasionally walking directly on bone, would have contributed to the difficult exploration of the cave system.
Funerary practices in space and time

Despite the difficulties of navigating this space, burial deposits accumulated vastly, reaching a depth of >5 m in some places (Stoddart et al. 2009a, 133). By applying taphonomic analysis to bones from overlying contexts in the stratigraphy, funerary practices over time in several areas of the site were reconstructed. Depositions were classified as primary (interment of whole bodies soon after death), successive (repeated deposition in a variety of forms), residual (bones left over following movement of selected elements), and secondary (curation and redistribution of bones, usually long bones or

Figure 4. Radiocarbon date frequency and density demonstrates intensification of burial in the mid-third millennium BC.

Figure 5. Visibility analysis of the hypogeum, showing the blocking effect of the megalithic screen in the Shrine area.

Funerary practices in space and time

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crania). These categories are based on an understanding of the differential attrition rate of skeletal elements when subjected to cultural and/or natural processes (see Robb 2016).

Many spaces witnessed changing trends in depositional practices (see Table 1). Areas predominantly containing secondary depositions may be largely restricted to the early and middle phases of the Tarxien phase, from 2900 to 2500 cal BC, but for the most part there do not seem to be any spaces where singular practices prevailed throughout centuries. The North bone pit was in use for several generations, during which varied depositional modes are evident. The deposit in the Southwest Niche is highly disturbed, with changing trends in bone removal, element caching and curation. The complex sequence in the Deep Zone encompasses disturbed primary interments and cranial caches. In the Shrine, primary interments dominate the sequence; select individuals remained in articulation in earlier levels, while later levels contained more partially articulated remains. In the Display area, where only one large stratigraphic context was identified, a similar emphasis on successive primary interments and the disturbance of remains is clear. Both spaces would have been highly visible from selected locations, a factor which likely influenced the ways in which they were used.

The evident spatial and temporal diversity in funerary practices counters predominant ideas about the structure of society in prehistoric Malta. If, as has been previously suggested, burial was restricted to selected kin groups, and the rites controlled by ‘ritual specialists’ (Bonanno 1996b; Bonanno et al. 1990; Cazzella and Recchia 2015; Stoddart 2002), we would reasonably expect to see greater rigidity in the use of burial space. The persistent multiplicity of ways to treat the dead, and the apparent flexibility of use in each area, instead speaks more strongly to its accessibility by multiple lineages or communities. There appear to have been some prevailing customs, for example, the frequent association between curated crania and megaliths, and the regular use of less visible areas for secondary deposition, but these were not firm structuring principles. Widely shared access to the hypogeum may at least partly negate, or complicate, hierarchical models. It is unsurprising that successive generations of relatively small communities would produce such a varied burial assemblage, which maintains similar foundations and practices over centuries, yet with seemingly few strong trends (cf. Keesing and Haug 2012).

**Table 1.** Funerary practices over time in locations with multiple contexts analysed.

|            | North bone pit                  | Southwest Niche                  | Deep Zone                              | Shrine                                      |
|------------|---------------------------------|----------------------------------|----------------------------------------|---------------------------------------------|
| Early: 2900–2700 BC | (799) successive deposition.     | *(697), (669), (662) and (663) secondary deposition. | *(1307) cranial curation. *(1234) and (1237) primary interments. *(1225) residual. | *(1328) ‘bundle burials’. *(1268) stacked primary and disturbed primary interments. |
|            | *(354) cranial curation.         | *(656) long bone curation.        | *(595) residual.                        |                                             |
| Middle: 2700–2500 BC | N/A                             | N/A                              | *(1144) residual. *(1111) and (1200) secondary deposition. | *(1024) cranial curation.                  |
| Late: 2500–2400 BC  | N/A                             | N/A                              | *(951) cranial curation. *(933) cranial curation. | *(1206) disturbed primary interments, successive deposition. *(960) disturbed primary interments, successive deposition. |

Contexts preceded with ‘*’ are described following reports in the original publication (see Stoddart et al. 2009b).
Primary interments formed the baseline for most funerary practices but there is extensive variation in the ways that the corpse, or skeleton, was subsequently treated. The treatment of primary interments changes noticeably over time. Less ‘structured’ disturbance is inferred in earlier contexts, particularly in the rock-cut tomb, where minimal skeletal articulations were noted. Practices of reduction – movement of bone in manners which do not appear to have been pre-planned – may have been necessitated by the small spaces of rock-cut tomb chambers. In contrast, the hypogeum allowed for greater movement of disarticulated body parts and bones. The middle and late phases of the hypogeum’s use suggest increased rapidity of deposition, which may be associated with population growth, resulting in less time elapsed between interments. If this is the case, greater interaction with decomposing corpses can be inferred, as opposed to the manipulation of already-skeletonized remains which predominated in earlier contexts.

Citation and social inclusion

Given that the remains of relatively few individuals were not disturbed through later interventions, a dominant praxis of disarticulating and redistributing the remains of the dead is apparent, which was extended even to young individuals. This is clearly shown by full analysis of all remains from one 1 × 1 m deposit within context (783). This area comprised 3,632 human bone fragments, >80% of

Figure 6. Articulating bones within a 1 × 1 m area of context (783) identified through GIS analysis.
which were non-adult elements. Some articulating regions and bone pairs were observed post-
excavation, including a forearm and hand, radius and ulna, and tibia and fibula. Their in situ location
showed them to be articulated (Figure 6), demonstrating carefully timed acts of disarticulation. Directly
on the bedrock, an adolescent was deposited, flexed on their right side with the right arm extended
alongside their body, and their left arm flexed across the chest. Discrepancies were noted between the
age estimations derived from long bone length (following Schaefer, Black, and Scheuer 2009) and
dental development (AlQahtani, Hector, and Liversidge 2010), with the former producing a younger
age estimate. Based on the available dentition (second molars fully developed with root apices closed,
upper left third molar impacted, and lower left third molar with roots fully developed but apices open),
this individual is estimated to be an older child, of 15.5 ± 3 years. Analysing the sequence of deposition
through GIS, three partial skeletons of further non-adults are visible in the upper levels (Figure 7). Two
of these individuals were placed on a similar axis as the basal individual. The third individual was
placed on a north-south axis, with their head to the south, facing east. During analysis, it was not
certain that these remains were excavated in anatomical connection. In all cases, the stage of vertebral
and rib fusion was assessed and, tentatively, two individuals are estimated as younger children while
the third individual is likely adolescent in age (Schaefer, Black, and Scheuer 2009). Skulls were removed
from two of these individuals, and limbs from all individuals, leaving the vertebrae and ribs remaining
in connection.

Figure 7. Primary interments of non-adults represented by axial skeletons (in blue), with two individuals in the
same position as the earliest buried individual in spit 3 (in yellow).
Combining bioarchaeological and spatial analyses, it is evident that depositional sequences were not always initiated by the interment of male adults. The citation of burial positions detected in this area appears to be a pattern borne out across other spaces within the hypogeum (e.g. the Shrine sequence and central pit, see Stoddart et al. 2009a, 121–22, 140–49). Memory clearly played a central role in depositional events (cf. Stoddart 2015). Over the short term of perhaps single generations, commemoration may have guided the placement and positioning of successive interments. Coming back to the deceased’s remains and directly interacting with them would have been an emotionally charged process. These embodied citational acts drew together relationships between the past and the present, and precipitated future events (Butler 1993; Jones 2005, 2007). Depositing the dead was a first step which oriented a sequence of future actions, including revisiting and redistributing body parts of the interred individual and, occasionally imitating their burial position with later interments. Areas were marked out for particular kinds of rites and perhaps also for certain individuals or kin groups over the short term. They located small-scale acts of remembering within a commemorative space, establishing an ‘emotional and mnemonic geography’ (Harris 2010).

The demography of the burials can be investigated at a broader level through quantitative analysis of the proportion of each context comprising non-adult elements (adolescent, child, infant and perinatal). Across a representative sample of 24 large contexts, the mean proportion of non-adults was 53%, with a standard deviation of 13%, demonstrating that there was a great degree of variability across the site with respect to the demographics of the excavated burial population in these areas (Stoddart et al. 2009a). The proportion of non-adults found in the adjacent and more ancient (c. 3300 BC) Xaghra rock-cut tomb was around 21% (Malone et al. 1995). During the intervening centuries, a different approach towards the burial of children became the norm. A closer look at these data reveals a faint pattern during the middle Tarxien, with contexts dating between 2700 and 2500 BC tending to have more non-adult remains (Table 2) than early or late contexts.

It is difficult to disentangle the combined effects of burial practice and fluctuations in the demographic structure of the living population, especially when accounting for the changing ecological context of the islands (French et al. 2018). However, these data suggest that there were more children around – at least in the funerary domain – during the middle part of the site’s use. This tallies with both the radiocarbon evidence from Xaghra, discussed above, and a phase of growth and elaboration observed elsewhere in the Maltese Islands (Evans 1959). As such, the number of children in the burial record is influenced by the age structure of the population at large, as growing pre-industrial populations are in general associated with more non-adult skeletal material at burial sites (Bocquet-Appel 2002; McFadden and Oxenham 2018). Furthermore, our own bioarchaeological research has identified the extent to which children were embodied and productive members of their local communities. Corporeal narratives elucidated by shared experiences of pathology,

### Table 2. The proportion of non-adult remains in selected major contexts.

| Context | N aged bones | % Non-adult | Zone       | Date         |
|---------|--------------|-------------|------------|--------------|
| 1268    | 489          | 46.8        | Shrine     | Early        |
| 595     | 394          | 28.9        | SW Niche   | Early        |
| 1144    | 363          | 50.1        | Deep Zone  | Middle       |
| 1241    | 1025         | 62.8        | East Cave  | Middle       |
| 1206    | 721          | 66.0        | Shrine     | Middle-Late  |
| 783     | 7398         | 48.2        | Display    | Late         |
| 951     | 409          | 42.3        | Deep Zone  | Late         |
| 960     | 1426         | 56.4        | Shrine     | Late         |
Conclusions

This study demonstrates the advantages of working with archival and post-exavation data, and the benefits to be gained from analysing burial spaces as landscapes at the micro-scale. Combining spatial, stratigraphic, chronological and skeletal data, the Xaghra Circle emerges as a space which was flexible and continually changing. Space-making was achieved through a complex sequence of burial practices involving revisiting and intervening with the remains of the dead, redistributing selected bones, and carefully managing visibility and movement through the reorganization of structural features. These activities culminated in an altered experience of space within the hypogeum towards the end of its use. On current evidence, the increase in depositions, greater number of non-adult burials, and more ‘structured’ interventions with the remains of the dead appear to have been broadly contemporary. At this time, the burial space would already have been well populated and required considerable management and maintenance. Spatial analysis particularly highlights the temporal junctures at which deposition was influenced, with short-term careful commemorative depositional acts contrasting with greater structural changes which involved the excavation of older buried remains. Despite the emotional attachment to this place, the burial space was not subject to extensive change and remodelling throughout the entirety of the site’s use.

The dynamic use of the burial space argues for an equally complex, and changing, social configuration throughout third millennium BC Malta. Recent work on the temples favours a more heterarchical model of society, seeing them as communal gathering spaces where ‘collective action was celebrated’ (McLaughlin et al. 2018, 6), perhaps in seasonal rituals (Barratt et al. 2018). At the Xaghra Circle, collective burials encompass the true meaning of the term, with an inclusive burial population which appears to represent the living community. With little evidence for distinct funerary practices according to age or gender, identity appears to have been composed and expressed differently. The incorporation of non-adults, including foetuses, within all forms of funerary treatment is exceptional compared to the demography of burial spaces across much of Neolithic Europe (Baiolo Modesti and Salerno 1998; Beck 2016; de Marinis 2013; Fernández-Crespo and de-la-Rúa 2015; Le Roy 2017; Waterman and Thomas 2011). Emerging evidence for population growth and the social role of children supports the suggestion that personhood was not strongly tied to reaching a particular biological age stage in Neolithic Malta. In contrast, the rise of gender-based distinctions in dress and funerary treatment at this time in Italy and the central Mediterranean (Robb and Harris 2018) seemingly marked the foundation of social stratification (Robb 1994). In a changing world, the Maltese islands appear to be one of the latest outposts of ‘Neolithic’ culture, and the Xaghra Circle may represent one of the last collective burial spaces with such open and diverse funerary practices.

Notes

1. Original analyses estimated the MNI within each context through accounting for age and sex across all skeletal elements. The results for each context were then summed to reach a site-wide total. There is some potential for double-counting within this method, as most elements are fragmentary and remains have been extensively redistributed across the site (Stoddart et al. 2009a).
2. It is unclear whether these represent primary interments of contracted individuals which were later disturbed or curated remains which were deposited as part of a final act. None of the individuals are complete and there are intriguing observations of ‘blackened bone’ (S. Stoddart et al. 2009a, 142), which have led some to suggest that these individuals may have been mummmified or otherwise preserved (Parker Pearson 2012).

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References

AlQahtani, S. J., M. P. Hector, and H. M. Liversidge. 2010. “Brief Communication: The London Atlas of Human Tooth Development and Eruption.” American Journal of Physical Anthropology 142 (3): 481–490. doi:10.1002/ajpa.v142.3.

Alt, K. W., S. Zesch, R. Garrido-Pena, C. Knipper, A. Szécényi-Nagy, C. Roth, C. Tejedor-Rodríguez, et al. 2016. “A Community in Life and Death: The Late Neolithic Megalithic Tomb at Alto De Reinoso (Burgos, Spain).” PLoS One 11 (1): e0146176. doi:10.1371/journal.pone.0146176.

Anderson, M., and S. Stoddart. 2007. “Mapping Cult Context: GIS Applications in Maltese Temples.” In Cult in Context: Reconsidering Ritual in Archaeology, edited by D. A. Barrowclough and C. Malone, 41–44. Oxford: Oxbow Books.

Aranda Jiménez, G., Á. Lozano Medina, M. Díaz-Zorita Bonilla, M. Sánchez Romero, and J. Escudero Carrillo. 2018. “Cultural Continuity and Social Resistance: The Chronology of Megalithic Funerary Practices in Southern Iberia.” European Journal of Archaeology 21 (2): 192–216. doi:10.1017/eaa.2017.42.

Bailo Modesti, G., and A. Salerno. 1998. Pontecagnano II.5 La necropoli eneolitica. Napoli: Istituto Universitario Orientale.

Barratt, R., C. Malone, T. R. McLaughlin, and S. Stoddart. 2018. “Celebrations in Prehistoric Malta.” World Archaeology 50 (2): 271–284. doi:10.1080/00438243.2018.1496029.

Barratt, R. P. 2016. “Interpreting and Presenting Archaeological Sites Using 3D Reconstruction: Virtual Exploration of the Xaghra Brochtorff Circle in Gozo.” MPhil thesis. University of Cambridge. https://www.academia.edu/35713061/Interpreting_and_Presenting_Archaeological_Sites_Using_3D_Reconstruction_Virtual_Exploration_of_the_Xaghra_Brochtorff_Circle_in_Gozo

Bayliss, A., and A. Whittle. 2007. “Histories of the Dead: Building Chronologies for Five Southern British Long Barrows.” Cambridge Archaeological Journal 17: 1–147. (S1, Supplement).

Beck, J. 2016. “Part of the Family: Age, Identity and Burial in Copper Age Iberia.” In Theoretical Approaches to Analysis and Interpretation of Commingled Human Remains, edited by A. J. Osterholtz, 47–73. Cham: Springer International.

Bergson, H. [1908] 1991. Matter and Memory. New York: Zone Books.

Bocquet-Appel, J.-P. 2002. “Paleoanthropological Traces of a Neolithic Demographic Transition.” Current Anthropology 43: 637–650. doi:10.1086/342429.

Bonanno, A. 1996a. “Temple Megalithism Vs. Funerary Megalithism: The Case of the Maltese Islands.” XIII International Congress of Prehistoric and Protohistoric Sciences (Forlì, Italy, 8-14 September 1996) Colloquia 9: 103–107.

Bonanno, A. 1996b. “The Artist in Prehistoric Religious Ritual: Servant or Master? in A.” In Maltese Prehistoric Art: 5000–2500 BC, edited by Pace, 53–59. Malta: Fondazzjoni Patrimonju Malti.

Bonanno, A., T. Gouder, C. Malone, and S. Stoddart. 1990. “Monuments in an Island Society: The Maltese Context.” World Archaeology 22 (2): 190–205. doi:10.1080/00438243.1990.9980140.

Butler, J. 1993. Bodies that Matter: On the Discursive Limits of “Sex”. London: Routledge.

Cazzella, A., and G. Recchia. 2015. “Chiefdom Societies in Prehistoric Malta?” Origini 38 (2): 87–110.

Connerton, P. 1989. How Societies Remember. Cambridge: Cambridge University Press.

de Marinis, R. C. 2013. “La Necropolis Di Remedello Sotto E L’età Del Rame Nella Pianura Padana a Nord Del Po.” In L’età Del Rame: La Pianura Padana E Le Alpi Al Tempo Di Ötzi, edited by R. C. de Marinis, 301–352. Brescia: Massetti Rodella Editori.

Dodson, P., and D. Wexler. 1979. “Taphonomic Investigations of Owl Pellets.” Paleobiology 5: 279–284.

Duday, H. 1979. The Archaeology of the Dead: Lectures in Archaeoanthropology. Oxford: Oxford University Press.

Evans, J. 1959. Ancient Peoples and Places: Malta. London: Thames & Hudson.

Evans, J. 1971. The Prehistoric Antiquities of the Maltese Islands: A Survey. London: Athlone Press.

Evans, J. 1996. “What Went on in a Maltese Megalithic ‘Temple’.” In Maltese Prehistoric Art: 5000–2500 BC, edited by A. Pace, 39–44. Malta: Fondazzjoni Patrimonju Malti.

Fernández-Crespo, T., and C. de-la-Rúa. 2015. “Demographic Evidence of Selective Burial in Megalithic Graves of Northern Spain.” Journal of Archaeological Science 53: 604–617. doi:10.1016/J.JAS.2014.11.015.

French, C., S. Taylor, R. McLaughlin, A. Cresswell, T. Kinnaird, D. Sanderson, S. Stoddart, and C. Malone. 2018. “A Neolithic Palaeo-catena for the Xaghra Upper Coralline Limestone Plateau of Gozo, Malta, and Its Implications for past Soil Development and Land Use.” Catena 171: 337–358. doi:10.1016/j.catena.2018.07.039.
Guilaine, J. 2015. “L’hypogôisme médiiterranéen.” In Les hypogôées protohistoriques de la Méditerranée Arles et Fontvieille, edited by J. Guilaine, 161–222. Arles: Errance.

Harris, O. 2010. “Emotional and Mnemonic Geographies at Hambledon Hill: Texturing Neolithic Places with Bodies and Bones.” Cambridge Archaeological Journal 20 (3): 357–371. doi:10.1017/S0959774310000466.

Jones, A. 2005. “Lives in Fragments? Personhood and the European Neolithic.” Journal of Social Archaeology 5 (2): 193–224. doi:10.1177/1469605305053367.

Jones, A. 2007. Memory and Material Culture. Cambridge: Cambridge University Press.

Knüsel, C. J., and J. Robb. 2016. “Funerary Taphonomy: An Overview of Goals and Methods.” Journal of Archaeological Science: Reports 10: 655–673. doi:10.1016/j.jasrep.2016.05.031.

Le Roy, M. 2017. “How Were Infants Considered at Death during the Neolithic Period in France?” In Children, Death and Burial: Archaeological Discourses, edited by E. Murphy and M. Le Roy, 19–34. Oxford: Oxbow Books.

Malone, C. 2007. “Ritual, Space and Structure - the Context of Cult in Malta and Gozo.” In Cult in Context: Reconsidering Ritual in Archaeology, edited by D. A. Barrowclough and C. A. T. Malone, 23–34. Oxford: Oxbow Books.

Malone, C., and S. Stoddart. 2009. “Conclusions.” In Mortuary Customs in Prehistoric Malta: Excavations at the Brokthoff Circle at Xaghra (1987-1994), edited by C. Malone, S. Stoddart, D. Trump, A. Bonanno, T. Gouder, and A. Pace, 361–384. Cambridge: McDonald Institute for Archaeological Research.

Malone, C. 2018. “Manipulating the Bones: Eating and Augury in the Maltese Temples.” In Ritual, Play and Belief in Evolution and Early Human Societies, edited by C. Renfrew, I. Morley, and M. Boyd, 187–208. Cambridge: Cambridge University Press.

Malone, C., N. Cutajar, T. R. McLaughlin, B. Mercieca-Spiteri, A. Pace, R. K. Power, S. Stoddart, et al. 2019. “Island Questions: The Chronology of the Brokthoff Circle at Xagpra, Gozo, and Its Significance for the Neolithic Sequence on Malta.” Archaeological and Anthropological Sciences 11 (8): 4251–4306. doi:10.1007/s12520-019-00790-y.

Malone, C., S. Stoddart, A. Bonanno, T. Gouder, and D. Trump. 1995. “Mortuary Ritual of the 4th Millennium BC Malta: The Zebug Period Chambered Tomb from the Brokthoff Circle at Xagpra (Gozo).” Proceedings of the Prehistoric Society 61: 303–345. doi:10.1017/S0079497X0000311X.

Malone, C., S. Stoddart, D. Trump, A. Bonanno, T. Gouder, and A. Pace. 2009. Mortuary Customs in Prehistoric Malta: Excavations at the Brokthoff Circle at Xaghra (1987-1994). Cambridge: McDonald Institute for Archaeological Research.

Martin, D. L., R. P. Harrod, and V. R. Pérez. 2013. Bioarchaeology: An Integrated Approach to Working with Human Remains. New York: Springer.

McFadden, C., and M. F. Oxenham. 2018. “Rate of Natural Population Increase as a Paleodemographic Measure of Growth.” Journal of Archaeological Science: Reports 19: 352–356. doi:10.1016/j.jasrep.2018.03.012.

McLaughlin, T. R. 2019. “On Applications of Space-time Modelling with Open-source 14C Age Calibration.” Journal of Archaeological Method and Theory 26 (2): 479–501. doi:10.1007/s10816-018-9381-3.

Parker Pearson, M. 2012. “Book Review: Mortuary Customs in Prehistoric Malta.” The Prehistoric Society website. Accessed 12 February 2018. http://www.prehistoric society.org/files/reviews/Mortuary_customs_in_Malta_review_final.pdf

Power, R. K., S. Stoddart, and C. Malone. Forthcoming. Death and Life in Neolithic Malta: Revisiting the Xaghra Hypogeum. Cambridge: McDonald Institute for Archaeological Research.

Robb, J. 1994. “Gender Contradictions, Moral Coalitions, and Inequality in Prehistoric Italy.” Journal of European Archaeology 2 (1): 20–49. doi:10.1177/09657669800719256.

Robb, J. 2016. “What Can We Really Say about Skeletal Part Representation, Mni and Funerary Ritual? A Simulation Approach.” Journal of Archaeological Science: Reports 10: 684–692.
Robb, J., E. S. Elster, E. Isetti, C. J. Knüsel, M. A. Tafuri, and A. Traverso. 2015. “Cleaning the Dead: Neolithic Ritual Processing of Human Bone at Scaloria Cave, Italy.” *Antiquity* 89 (343): 39–54. doi:10.15184/aaq.2014.35.

Robb, J. E., and O. J. T. Harris. 2018. “Becoming Gendered in European Prehistory: Was Neolithic Gender Fundamentally Different?” *American Antiquity* 83 (1): 128–147. doi:10.1017/aaq.2017.54.

Schaefer, M., S. Black, and L. Scheuer. 2009. *Juvenile Osteology. A Laboratory and Field Manual*. London: Academic Press.

Schulting, R., A. Sheridan, R. Crozier, and E. Murphy. 2010. “Revisiting Quanterness: New AMS Dates and Stable Isotope Data from an Orcadian Chamber Tomb.” *Proceedings of the Society of Antiquaries Scotland* 140: 1–50.

Schulz Paulsson, B. 2017. *Time and Stone: The Emergence and Development of Megaliths and Megalithic Societies in Europe*. Oxford: Archaeopress.

Schulz Paulsson, B. 2019. “Radiocarbon Dates and Bayesian Modeling Support Maritime Diffusion Model for Megaliths in Europe.” *PNAS* 116 (9): 3460–3465. doi:10.1073/pnas.1813268116.

Shanks, M., and C. Y. Tilley. 1982. “Ideology, Symbolic Power and Ritual Communication: A Reinterpretation of Neolithic Mortuary Practices.” In *Symbolic and Structural Archaeology*, edited by I. Hodder, 129–154. Cambridge: Cambridge University Press.

Skeates, R. 2016. “Experiencing Darkness and Light in Caves: Later Prehistoric Examples from Seulo in Central Sardinia.” In *The Archaeology of Darkness*, edited by M. Dowd and R. Hensley, 39–49. Oxford: Oxbow Books.

Smith, M., and M. Brickley. 2009. *People of the Long Barrows*. Stroud: History Press.

Stoddart, S., S. Mason, B. Trump, and D. Trump. 2009b. “Taxien Phase Levels: Spatial and Stratigraphic Analysis and Reconstruction.” In *Mortuary Customs in Prehistoric Malta: Excavations at the Brochtorff Circle at Xagħra (1987-1994)*, edited by C. Malone, S. Stoddart, D. Trump, A. Bonanno, T. Gouder, and A. Pace, 315–340. Cambridge: McDonald Institute for Archaeological Research.

Stoddart, S., C. Malone, S. Mason, B. Trump, and D. Trump. 2009a. “Hypogae: Concealed Caves or Constructed Temples? the Hypogea of Malta and Their Significance.” In *In Links between Megalithism and Hypogeism in Western Mediterranean Europe*, edited by J. A. Câmara Serrano, J. A. Afonso Marrero, and L. Spanedda, 21–27. Oxford: Archaeopress.

Stoddart, S., and C. Malone. 2010. “Mediating the Dominion of Death in Prehistoric Malta.” In *Death Rituals, Social Order and the Archaeology of Immortality in the Ancient World*, edited by C. Renfrew, M. J. Boyd, and I. Morley, 130–137. Cambridge: Cambridge University Press.

Stoddart, S., and C. Malone. 2015. “Prehistoric Maltese Death: Democratic Theatre or Elite Democracy?” In *Death Embodied: Archaeological Approaches to the Treatment of the Corpse*, edited by Z. L. Devlin and E.-J. Graham, 160–174. Oxford: Oxbow Books.

Stoddart, S., C. Malone, M. Anderson, and R. P. Barratt. 2019. “Light and Dark in Prehistoric Malta.” In *The Oxford Handbook of Light in Archaeology*, edited by C. Papadopoulos and H. Moyes. Oxford: Oxford University Press.

Thompson, J. E., R. K. Power, B. Mericca-Spiteri, T. R. McLaughlin, J. Robb, S. Stoddart, and C. Malone. *Forthcoming*. “Reconstructing deathways at the Xagħra Circle and Xemxija Tombs through Funerary Taphonomy.” In *Death and Life in Neolithic Malta: Revisiting the Xagħra Hypogeum*, edited by R. K. Power, S. Stoddart, and C. Malone. Cambridge: McDonald Institute for Archaeological Research.

Turnbull, D. 2002. “Performance and Narrative, Bodies and Movement in the Construction of Places and Objects, Spaces and Knowledges: The Case of the Maltese Megaliths.” *Theory, Culture and Society* 19 (5/6): 125–143. doi:10.1177/026327602761899183.

Waterman, A. J., and J. T. Thomas. 2011. “When the Bough Breaks: Childhood Mortality and Burial Practice in Late Neolithic Atlantic Europe.” *Oxford Journal of Archaeology* 30 (2): 165–183. doi:10.1111/ojoa.2011.30.issue-2.
Whitehouse, R. D. 1972. “The Rock-cut Tombs of the Central Mediterranean.” *Antiquity* 46 (184): 275–281. doi:10.1017/S0003598X00053874.

Whitehouse, R. D. 1992. *Underground Religion: Cult and Culture in Prehistoric Italy*. London: Accordia Research Institute.

Zammit, T. 1925a. “Bur Mghez Cave – Mkabba.” *Museum Annual Report 1912-1923*, 2–3.

Zammit, T. 1925b. *The Hal-Safieni Hypogeum “Casal-paula - Malta”. A Short Description of the Monument with Plan and Illustrations*. Malta: Empire Press.