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Monuments and landscapes in Late Neolithic Malta

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The imposing prehistoric buildings of the Maltese islands have long fascinated Mediterranean travellers. They have also been the subject of much archaeological study and speculation, most of which has focused on their architectural development and the technology used to construct them. Now investigation of the relationship between these impressive sites and the islands' landscapes is yielding new insights into how the Neolithic islanders organized their world.

The Maltese islands form a small archipelago some 90 km off the southeastern tip of Sicily (Fig. 1). In spite of their small size, they are full of archaeological surprises. Perhaps the greatest surprise is that some of the most astonishing Neolithic buildings ever discovered are to be found there. They were raised in the course of the fourth and early third millennia BC (between *c.* 3600 and *c.* 2500 cal BC),[2] during which time they became increasingly ambitious and sophisticated. Although the earlier buildings consisted of three vaulted chambers arranged around a central court, they often developed later into complexes of several adjoining buildings with elaborate plans (Fig. 2). The chambers were superbly engineered vaults that were originally roofed over. Massively built with carefully fitted megaliths (huge stones), these structures became imposing and durable features in the landscape.

From giants to GIS

Until the late eighteenth century, it was widely held by scholars that the colossal stonework of these strange and remarkable buildings must have been the work of a race of giants or Cyclopes.[3] During the nineteenth century, they were attributed to the Phoenicians;[4] and it was only at the beginning of the twentieth century that it was realized that these buildings had been created by a prehistoric society.

Throughout the twentieth century, one of the main aims of research on Maltese prehistory was to understand how these architectural forms developed and how they were built. Particular attention was devoted to identifying and dating the different cultural phases that could be recognized in the material remains. A major contribution to this research was a comprehensive survey and cataloguing of all the known prehistoric evidence conducted by John Evans, a former director of the Institute of Archaeology, during the 1950s and 1960s. The resulting volume is still the key reference work on Maltese prehistory.[5]

Partly because there were so many questions to answer and so many enigmas to solve within these sites, most research during the twentieth century focused on the sites themselves. Less time was spent trying to understand the relationship between the buildings and the surrounding landscape. The aim of the work described here is to gain a better understanding of this relationship. Prehistoric buildings in many parts of the world often played an important role in the organization of the landscape. Through an understanding of how Malta's megalithic buildings were positioned in relation to their surroundings, we may also improve our understanding of how the prehistoric islanders thought about and organized their world.

The topography of the Maltese archipelago has been shaped by three main geological factors: structure, erosion and faulting.[6] Their combined effect has created a distinctive and highly segmented landscape. Areas of level ground are sharply demarcated by steep slopes, faults or deep valleys. This division of the landscape into natural compartments may have had a very direct bearing on how it was perceived and organized at different times in the past. These geological processes had already shaped the islands into their present form well before the Late Neolithic period. During the past 6000 years, changes in sea level have been minor,[7] and changes to the topography and coastline of the archipelago have been limited to local processes, such as the partial silting up of some bays. Most of the topographic features that we see today have not changed significantly since the Late Neolithic, and are likely to have had an important influence on the way the landscape was organized then.

Different societies may perceive the landscape in very different ways, and as a result the way they physically organize it

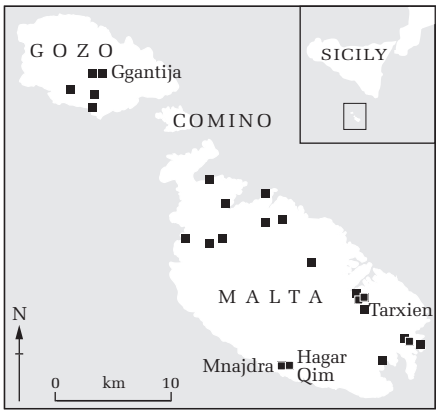

Figure 1 *The islands of the Maltese archipelago, showing the location of the known megalithic buildings of the Late Neolithic period; only those sites referred to in the text are named.*

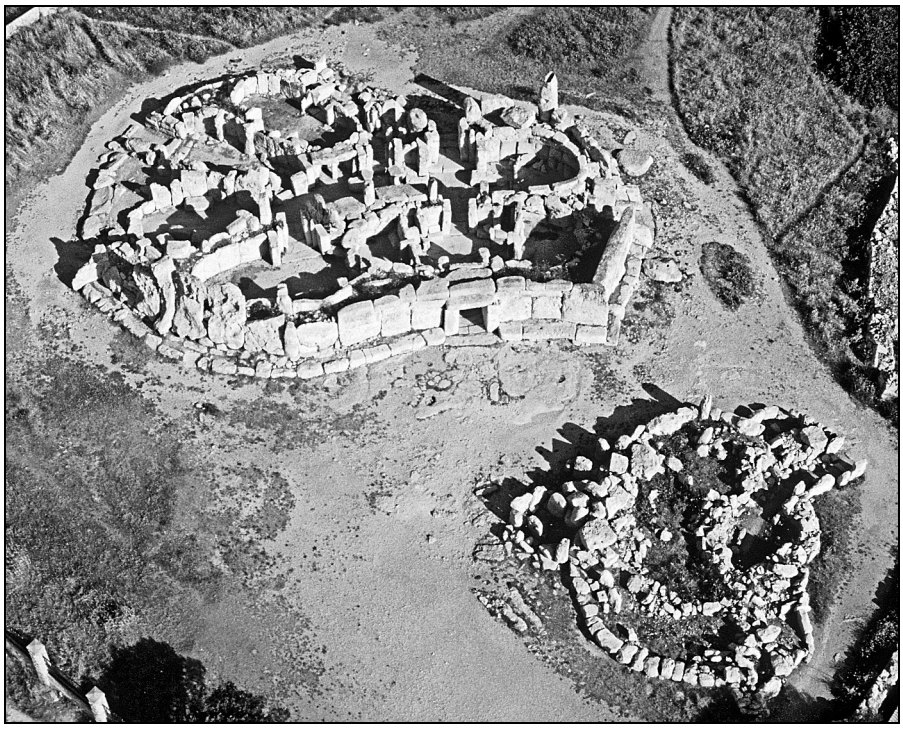

Figure 2 *Aerial view of the megalithic site at Hagar Qim, Malta; the complex layout of the structures is the result of successive building interventions.*

may also vary. When studying past attitudes to and organization of landscapes, the challenge is to reconstruct them from the material record. In the context of the Maltese Neolithic, this challenge remains largely unexplored. A notable exception is a model proposed by the British archaeologist Colin Renfrew in 1973.[8] He suggested that the Maltese monumental sites were grouped into clusters that functioned as the centres of the territories of different chiefdoms. The model also divided the landscape into hypothetical territories around these centres. However, a limitation of such models is that they tend to treat space as homogeneous and two-dimensional, and they seldom take the influence of local topography into account. Another difficulty is the presumption that a monument was located at the centre of its territory. Nor, in Renfrew's model, was the important factor of insularity considered. More recently, work such as that of another British archaeologist, Richard Bradley, has shown that the location and architecture of prehistoric monuments is often a response to their landscape setting.[9] Consequently, if monuments are to be understood more fully, they should be studied in relation to the landscape.

With the development of GIS (geographical information system) computer programmes, the task of assessing the location of sites in the landscape has become much easier and faster.[10] GIS programmes make it possible to build maps containing many layers of information. These can then be used to investigate what sort of relationships may exist between these different types of information. For example, it becomes very easy to check whether there was a preference to locate sites on low ground or high ground, or whether elevation was simply ignored when decisions were taken on where to position a building. With the help of statistical tests, it is also possible to check whether a perceived pattern in the data is actually significant. In this way, it is possible to start building a picture of some of the values and perceptions of the people who took these decisions.

Monuments in a landscape

In the results obtained so far, some patterns have emerged very clearly. The choice of site for monumental buildings did not take into account the height above sea level or the slope of the ground. More surprisingly, the choice does not appear to have been influenced by the kind of stone that was available for building in different parts of the islands.

The Maltese islands are basically composed of two different types of stone, with very different properties: coralline limestone, which is usually very hard and difficult to work, and globigerina limestone, which is softer and easier to shape and cut. In spite of these differences, the prehistoric builders did not choose to construct their megalithic complexes near sources of the softer stone. Instead, the buildings are found spread across both types of geology. The builders generally used the stone most readily available around a site. As a result, two very different ways of building were developed, suited to the properties of these two types of limestone. Megalithic sites located on the hard coralline limestone are built of boulders of irregular shape (Fig. 3), whereas sites located on the much softer globigerina limestone, which could be carved and dressed, are built of regular ashlar (hewn stone) masonry (Fig. 4). For this reason, the appearances today of the two types of site present a sharp contrast. However, this difference was probably much less conspicuous when the sites were in use, because there is some evidence that both types of masonry were plastered over, concealing the differences that we find so striking today.

Figure 3 *Interior view of a chamber in the Ggantija temples, Gozo; much of this complex is built of coralline limestone boulders of irregular shape.*

This last point allows us to draw two conclusions. First, it was important for people living in different parts of the archipelago to share the same architectural form. In spite of the different constraints and opportunities presented by the local geology, ingenious solutions were developed to create the same architectural forms out of the two different types of limestone. Secondly, the location of the monuments was evidently decided by considerations more important than the source of building materials. To find out what these considerations may have been, we must look at

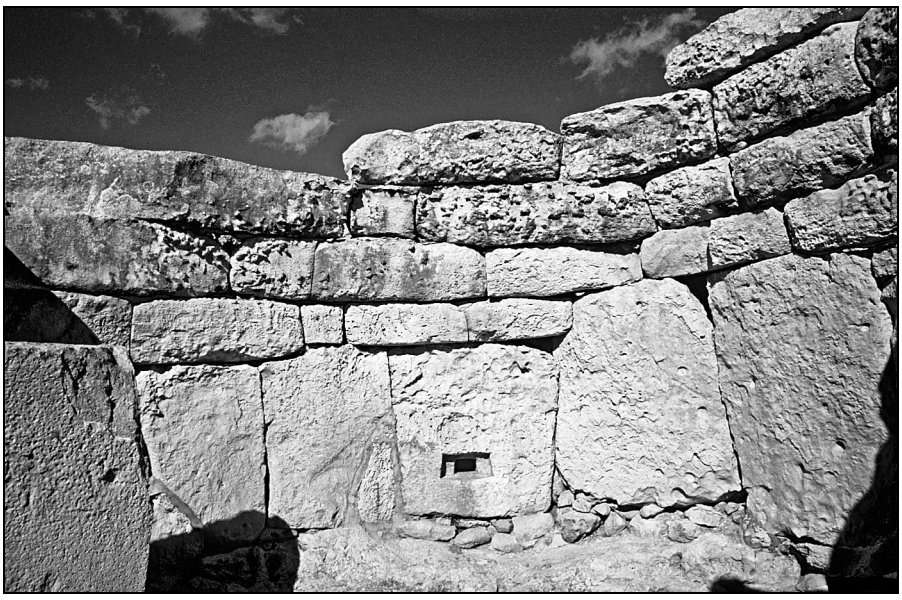

Figure 4 *This interior view of a chamber at Mnajdra, Malta, shows the carefully dressed megaliths that could be worked from globigerina limestone, which contrast sharply with the chamber shown in Figure 3.*

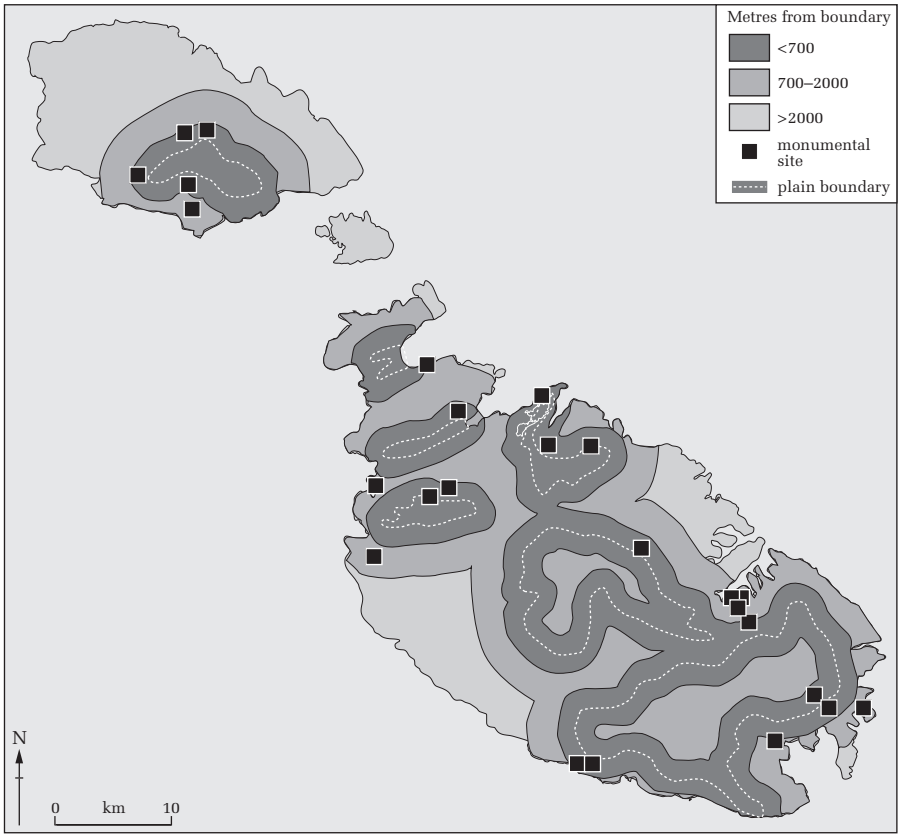

Figure 5 *The distribution of Late Neolithic monumental sites, shown against the distance from the edges of plains; this demonstrates the preference for locations close to plain boundaries, which was also confirmed statistically.*

the relationship of the sites to the broader landscape.

From the plains . . .

The geological make-up of the archipelago, and processes of faulting and erosion, have resulted in a topography of sharp contrasts. Fertile plains are often demarcated by dramatic features, such as deeply incised water courses or ridges, produced by faulting. One possible factor in the distribution of monumental sites is that they are close to the plains, more specifically near the edges of plains. This impression was tested by defining the boundaries of the seven principal plains that occur across the archipelago, and categorizing the landscape into bands of increasing distance from these boundaries. When the distribution of sites across these bands was tested statistically,[11] the result showed a strong preference for locating the sites near the boundaries of plains (Fig. 5).

This result raises interesting questions. Both the soil quality and the topography of the plains provide optimal conditions for agriculture.[12] In the mid-seventeenth century, for instance, the plains were used for the cultivation of cereals, while steeper terrain was used for horticulture.[13] One of the advantages of the plains is that they can be cultivated without requiring the labour-intensive building of terraces. The earliest dated agricultural terraces in the Mediterranean are generally assigned to the Bronze Age.[14] This suggests that in Neolithic Malta the plains are likely to have been core areas of agricultural exploitation. The distribution of the megalithic sites further suggests that these sharply demarcated plains played an important role in the social organization of space.

The relationship between the plains and the monuments has been explored by a further statistical test. The size and number of known monumental sites was compared to the size of the plains around which they occur. In three of the seven plains, there is a very similar ratio between the estimated total area of known monumental buildings and the area of the plain with which they are associated. This is a further indication of the close relationship between the productive capacity of the plains and the building of the monuments.

. . . to the sea

One of the key variables that may determine site location in a coastal or island context is the relationship with the sea. Much of the Maltese coastline consists of completely inaccessible cliffs (Fig. 6), which are interrupted by only a few sheltered bays that provide embarkation points. It had long been noted that Maltese megalithic sites are often near bays that give access to the sea,[15] but the relationship between site location and accessibility from the sea has not previously been tested.

One way to quantify and test this relationship is to create what is referred to as a cost surface. A GIS model of the landscape makes it possible to create an approximate representation of the effort required to reach different parts of the island from convenient embarkation points, taking into account the variable nature of the coastline and the slope of the land in different parts of the island. This categorization of the landscape then allows a quantitative comparison to be made between site distribution and accessibility from the sea. When this relationship was tested statistically, the result showed that there was a strong preference for locating the megalithic sites in areas that are accessible from the shore.

Intervisibility of the monuments and the sea

It is interesting to compare this result with another possible type of relationship with the sea: intervisibility. Different locations may command extensive or limited views of the shoreline or the sea, and, likewise, a building may be more or less visible from the shoreline or the sea according to where it is placed. In the Maltese islands, it appears that these considerations were not

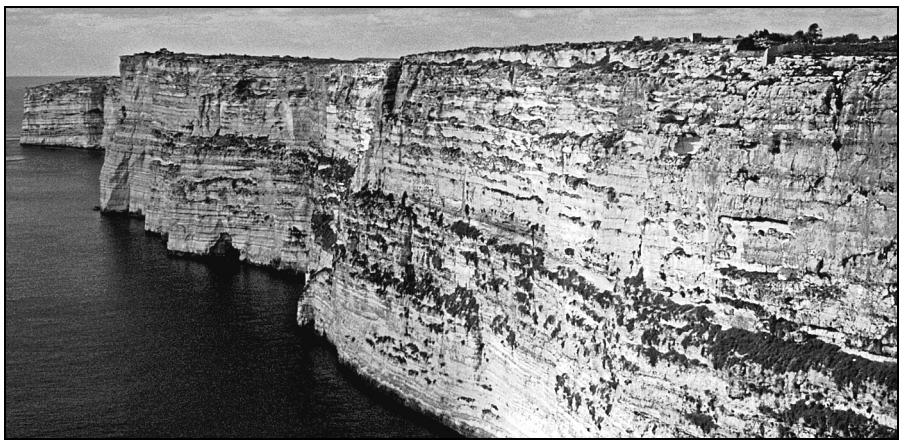

Figure 6 *Cliffs at Ta' Cenc, southern Gozo; much of the coastline of the Maltese islands consists of vertical cliffs or rocky shores that make it difficult to embark or disembark from boats.*

a determining factor in the choice of location of the monuments. There are several examples where the intervisibility between the megalithic buildings and the shoreline could easily have been improved by choosing a site only a few metres away from the buildings' actual location. The absence of megalithic sites all along the high cliffs on the southwestern coast of Malta also suggests that a high degree of intervisibility with the sea was not one of the determining factors in the choice of site location, nor does there appear to be any concern with choosing locations where the sites would be less visible from the sea.

Connectivity

The preceding discussion shows that, although intervisibility with the sea was not a significant factor in site location, proximity to embarkation points was an important consideration. This suggests that the sites may be related to connectivity between different parts of the archipelago and with the world beyond. The megalithic buildings are located along natural corridors of communication between the plains and the sea. Maritime interaction must have been important for several reasons. First, it is now being recognized that, in the Late Neolithic, communication with Sicily and the outside world was more important than previously supposed.[16] The fact that exotic imports appear to be evenly distributed across Malta and Gozo, as well as the consistent positioning of megalithic complexes near the sea, suggests that communities in different parts of the archipelago maintained direct and autonomous contacts with the outside world. Secondly, communication by sea must also have been important for interaction between different groups within the islands. The very high level of homogeneity in material culture, ritual practice and monumental architecture across the archipelago points clearly to intense intergroup interaction. Two of the largest plains, around which we find the largest concentrations of monuments, are located on different islands, one on Gozo and the other in southeastern Malta (Fig. 1).

The morphology and orientation of the archipelago provide further incentives for maritime travel. The northwest–southeast orientation of Malta effectively meant that the smaller groups of monuments in northern Malta were strung along the routes of interaction between the two largest concentrations. Furthermore, the succession of steep parallel ridges and valleys that characterize the whole of northwestern Malta present a significant obstacle to terrestrial travel along the main axis of the island. The morphology of the islands also offered a choice between two maritime routes – along the southwestern or the northeastern coast of Malta – one of which is normally sheltered, despite varying conditions of wind and swell. These environmental incentives would have helped to ensure that boat building and navigational skills were maintained and developed. In this sense, the environment provided an ideal training ground for the maritime skills that were required to maintain contact with Sicily and the world beyond.

Conclusions

The initial results of this investigation of the relationships between landscapes and monuments in the Maltese islands are beginning to provide a fuller understanding of megalithic monumentality in the Late Neolithic, and they lead to three preliminary conclusions. First, the suggestion that monumental sites are located at the centres of their territories no longer appears tenable. Secondly, the monuments and the activities associated with them were closely tied to the plains that punctuate the landscape. The plains are likely to have been core agricultural areas, because they provided favourable conditions for cultivation without requiring labour-intensive terrace construction. Topography was evidently important in determining organizational units, which were formalized by monument building that followed naturally ordained divisions of the landscape. Thirdly, the location of the megalithic complexes was closely linked to maritime connectivity, and they were positioned at natural thresholds between land and sea. One of the purposes of the buildings may have been to act as ceremonial gateways that mediated interaction between communities living in different parts of the archipelago, as well as interaction with the outside world.

Notes

1. The issues discussed in this article are part of my doctoral research at the Institute of Archaeology, jointly supervised by Tim Schadla-Hall and Ruth Whitehouse, and funded by the Commonwealth Scholarship Commission in the United Kingdom.
2. These are calibrated radiocarbon dates that give results in calendar years; for an explanation of calibrated and uncalibrated radiocarbon dates, see p. 2 of *Archaeology International 1997/98*.
3. For example, G. F. Abela, *Della descrittione di Malta isola nel mare Siciliano con le sue antichita, ed altre notitie* (Malta: P. Bonacota, 1647) and G. Abela & G. Ciantar, *Malta illustrata, ovvero descrizione di Malta, isola del mare siciliano e adriatico, con le sue antichita* (Malta: Stamperia del Palazzo, 1772).
4. A. A. Caruana, *Report on the Phœnician and Roman antiquities in the group of the islands of Malta* (Malta: Government Printing Office, 1882).
5. J. D. Evans, *The prehistoric antiquities of the Maltese islands* (London: Athlone Press, 1971).
6. See J. C. Dewdney, "Relief and landforms" in *Malta: background for development*, H. Bowen-Jones, J. C. Dewdney, W. B. Fisher (eds), 34–42. (Durham: Department of Geography, University of Durham, 1961), and J. H. Illies, "Graben formation – the Maltese islands – a case history", *Tectonophysics* **73**, 151–68, 1981.
7. See K. Lambeck, "Sea-level change and shoreline evolution in Aegean Greece since Upper Palaeolithic time", *Antiquity* **70**, 588–611, 1996, and K. Lambeck & E. Bard, "Sea-level change along the French Mediterranean coast for the past 30,000 years", *Earth and Planetary Science Letters* **175**, 203–222, 2000.
8. C. Renfrew, *Before civilization: the radiocarbon revolution and prehistoric Europe* (London: Jonathan Cape, 1973), developed further in C. Renfrew & E. V. Level, "Exploring dominance: predicting polities from centres" in *Transformations: mathematical approaches to culture change*, C. Renfrew & K. L. Cooke (eds), 145–68 (New York: Academic Press, 1979).
9. See for example R. Bradley, *Altering the Earth: the origins of monuments in Britain and continental Europe* (Edinburgh: Society of Antiquaries of Scotland, 1993), R. Bradley, *Rock art and the prehistory of Atlantic Europe: signing the land* (London: Routledge, 1997) and C. Richards, "Monuments as landscape: creating the centre of the world in late Neolithic Orkney", *World Archaeology* **28**, 190–208, 1996.
10. I am grateful to Andrew Bevan, Stuart Brookes, James Conolly, Mark Lake and Ash Rennie for their constant support in the GIS laboratory of the Institute of Archaeology.
11. The statistical technique of Kolmogorov–Smirnov testing was used to compare the cumulative distributions of different variables. I am indebted to Clive Orton of the Institute of Archaeology for his generous advice and help.
12. See D. Lang, "Soils" in *Malta: background for development*, H. Bowen-Jones, J. C. Dewdney, W. B. Fisher (eds), 83–98 (Durham: Department of Geography, University of Durham, 1961).
13. See pp. 130–31 in Abela (1647: *n.* 3 above).
14. For example, C. A. I. French & T. M. Whitelaw, "Soil erosion, agricultural terracing and site formation processes at Markiani, Amorgos, Greece: the micromorphological perspective", *Geoarchaeology* **14**, 151–89, 1999.
15. T. Zammit, "Ta' Hajrat megalithic ruins at Mjar, Malta", *Bulletin of the Museum* (Malta) **1**, 5–25, 1929; and A. Pace, "The artistic legacy of small island communities" in *Maltese prehistoric art, 5000–2500 BC*, A. Pace (ed.), 1–12 (Valletta: Patrimonju Publishing, 1996).
16. C. Hayden, *Interaction and development: the Late Neolithic and Copper Age archaeology of western Mediterranean islands*, PhD thesis, Department of Archaeology, University of Cambridge, 1998; and J. Robb, "Island identities: ritual, travel and the creation of difference in Neolithic Malta", *European Journal of Archaeology* **4**, 175–202, 2001.