Preserving the Megalithic Temples of Malta - the interdisciplinary approach

Joann Cassar1; Shirley Cefai1; Mario Galea2; Reuben Grima1; Katya Stroud2; Alex Torpiano1

1 Faculty for the Built Environment, University of Malta, Msida, Malta; 2 Heritage Malta, Triq il-Missjoni Taljana, Kalkara KKR 9030, Malta

1. Introduction

This paper gives an overview of nearly two decades of collaborative work between a range of professionals in different disciplines, focussed on the task of preserving a group of extraordinary prehistoric monuments, known as the Megalithic Temples of Malta. The term ‘interdisciplinary’ has been deliberately used in the title to emphasise the nature of the interaction between these different professionals. While ‘multidisciplinary’ is generally understood to refer to efforts in a range of different disciplines making separate contributions to a single collective objective, ‘interdisciplinary’ is here used to emphasise the interaction and interdependence between the inputs by different specialists, reflected in the authorship of this paper. Since 1994, when an inter-disciplinary team was first formed to address the immediate challenge posed by an extensive collapse at one of these sites, and more formally since the formation of a Scientific Committee in 2000 to address the broader conservation issues on these sites, the modus operandi has been characterised by open debate and engagement between different team members throughout the entire process to develop appropriate solutions. This interaction is considered crucial to the successes and achievements that have been registered to date.

2. The Temples

The group of prehistoric monuments known as the Megalithic Temples of Malta represent a unique architectural tradition that flourished on the Maltese Islands between the mid-fourth and the mid-third millennium BC, making them one of the earliest groups of monumental buildings of such sophistication in the whole world. They are witness to an exceptional prehistoric culture that produced remarkable architectural, artistic and technological developments. There are over twenty known prehistoric temple sites across the Maltese Islands, although only six of these are regularly open to the public. While each monument has its distinctive features, they all share some common characteristics. They are typically approached across an elliptical forecourt, delineated on one side by the monument’s concave façade. The façade and internal walls consist of upright stone slabs, known as orthostats, surmounted by horizontal blocks. The horizontal courses that have survived indicate that these monuments were originally roofed. The roof was formed of corbelled masonry courses probably capped by a flat roof, a remarkably sophisticated solution for its time.

The external walls are usually constructed in larger blocks which are set alternately face out and edge out, tying the wall securely into the rest of the building. The space between the external wall and the walls of the inner chambers is filled with stones and earth, binding the whole structure together.
Typically, the entrance to the building is found in the centre of the façade, leading through a monumental passage-way onto a paved court. Within the buildings, semi-circular chambers, usually referred to as apses, are found symmetrically arranged on either side of the main axis (Figure 1). The monuments vary in the number of apses; some have three apses opening off the central court, whilst others have successive courts with four, five, or in one case, six apses.

Depending on what materials were available in the vicinity, the builders preferred to raise the exposed external walls in the hard Coralline Limestone, and to use the softer Globigerina Limestone for the more sheltered interiors. Globigerina Limestone was also used for decorated elements. The builders of these monuments evidently had a thorough knowledge of the construction materials that were available on the islands.

Sculptural features found within these buildings bear witness to a high level of craftsmanship. These elements consist mainly of panels decorated with drilled holes, as well as low-relief panels depicting spiral motifs, trees, plants and various animals. The form and layout of these buildings, as well as the artefacts found within them all suggest that they were an important ritual focus of an organised community.

The value of the Megalithic Temples of Malta has been recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The 1972 UNESCO World Heritage Convention provides for the inscription of sites of outstanding universal value on the World Heritage List. One group of Temples, those of Ġgantija, were inscribed on this List in 1980. In 1992, this inscription was extended to include the sites of Ħaġar Qim, Mnajdra, Skorba, ta’ Ħaġrat, and Tarxien. These sites are managed by the national agency Heritage Malta in accordance with the Cultural Heritage Act (2002 and subsequent
amendments), which provides for and regulates national bodies for the protection and management of cultural heritage resources. The inscription of the Maltese Megalithic Temples recognizes that they are “an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates a significant stage in human history.” The architecture of the Temples represents a distinctive architectural form that was highly innovative and sophisticated for its time, making them a fundamental reference point for the history of architecture. In addition, the Megalithic Temples have yielded an extraordinary concentration of sculpture and other art forms. Collectively, they form a distinctive and sophisticated assemblage, representing a very specific system of beliefs and modes of representation. Locally, the Megalithic Temples have played a central role in the development of archaeological research and are also the best indicator available to us at present to help us understand how the Maltese Islands were organized and inhabited during the Late Neolithic period, since the evidence for domestic structures is much harder to detect.

These monuments have become a powerful symbol of Maltese national identity. The unique nature of these structures has made them synonymous with the Maltese Islands, and is a vital component in the islands’ cultural tourism promotion. Tourism has become one of the pillars of the Maltese economy and the exceptional character of these monuments makes them important magnets for cultural tourism, so much so that they are heavily relied on to promote Malta as a unique cultural destination.

In addition, the Megalithic Temples are an educational resource of great potential. They may be utilised to illustrate the achievements of the Temple Culture, the transition from the Neolithic to the Bronze Age, the prehistoric origins of human exploitation of the Maltese archipelago, the changing relationship between people and their environment, and the problems of sustainability and resource conflict in a small island context.

In nominating these monuments for inclusion in the World Heritage List, the Government of Malta has committed itself to safeguard these sites for the enjoyment of present and future generations on behalf of the international community. This was not always the case, however, as discussed in the following section.

3. Background (before Scientific Committee)

In the 19th century, the Maltese were under colonial rule and it is argued by a number of academics in the field that this influenced the value and significance the Maltese gave to the Megalithic Temples. It is customary that a colonised country will know more about the history of the coloniser than its own history. It was in the 19th and early 20th century, under the British government, that the Temple sites were excavated. In fact the socio-political pressures on the Island pushed towards the dating of the Temples as belonging to the Phoenician period hence attempting to link Maltese society to their colonial ancestors [Vella and Gilkes, 2001].

A hypothesis may be put forward that since the Megalithic Temples were not fully understood and since their true value and significance was not known,
the structures themselves were not given their due importance. In fact, during the excavations of the late 19th and early 20th century, the interventions carried out were aimed at helping the legibility of the site and not particularly the material preservation. This may also have been due to the fact that society would not have given the sites any importance if they were perceived simply as a pile of stones and the spaces they once may have enclosed was not better explained by the structures themselves.

After groundbreaking work on known and newly discovered sites by the archaeologist Sir Themistocles Zammit in the early decades of the twentieth century, in the late 1950s and early 1960s one can perceive a sustained consciousness towards the management of the sites. This came in the form of, for example, the decision to build a boundary wall around Ħagar Qim Temples. Though met with opposition by a local NGO, it demonstrates one of the first attempts to protect the site in its material form. It was a direct message given to all that the site was important enough to warrant limited access.

In the same period, we find another attempt to preserve the sites by the then Curator of the archaeological section within the Museums Department, Dr Baldacchino who was then responsible for the management and conservation of these sites. He initiated the concern towards preserving the material structure of the Temples and asked for funding for the application of linseed oil to stone structures. Though not based on research, it is the first documented attempt towards a materials-based approach in the preservation of these sites. The application of this material, which was then believed to aid the slowing down of the deterioration process of the megaliths, went on till the 1980s when the oil was applied every year [Cassar, 1988]. This was stopped some years later.

Up to the 1980s, we find a number of attempts at the preservation and management of the temple sites but none were holistic in their approach. It was only in the late 1980s and the 1990s that studies were carried out. These included not only research about the material which constituted the Temple structures but also studies about the stability of the temple structure and their documentation. These studies were spurred partly by collapses which the structures experienced during the 1990s [Mnajdra, 1994; Ħagar Qim, 1998]. These collapses and the limited documentation pushed the Maltese government to take on an initiative to take a more professional approach towards the preservation of the Megalithic Temples.

4. Scientific Committee - history and workings

In recognition of the fragility of the Temples, made particularly evident by these collapses, in May 1999, the Ministry of Education convened an international experts’ meeting. This meeting brought together a range of expertise and experiences to formulate possible strategies for the conservation and management of the Megalithic Temples. One of the recommendations resulting from this meeting was the establishment of an Advisory Committee to provide the Museums Department, still responsible for the management and conservation of these sites, with support in technical matters, and in the definition of a management and conservation strategy for the Temples.
The Scientific Committee for the Conservation of the Megalithic Temples was therefore established in 2000 by the Ministry responsible for culture. It is an interdisciplinary team including experts in conservation, conservation science, archaeology, heritage management, ecology, architecture and structural engineering, and includes representatives from the University of Malta, ICOMOS Malta (until 2012), as well as Heritage Malta. The committee is responsible for advising Heritage Malta on the research necessary and the best solutions for the conservation of the Megalithic Temples.

5. Scientific Committee - achievements and interventions
The remit of the Scientific Committee, which is still active, includes all matters related to the conservation of the Megalithic Temples of Malta. One of its first tasks was the drafting of a five-year Conservation Plan (Scientific Committee, 2008), which was presented to the World Heritage Committee (UNESCO). The Conservation Plan is a supporting document to the Management Plan for the Megalithic Temples and inbuilds methodologies for their preventive, material and structural conservation. The Conservation Plan thus outlines conservation issues and indicates the main causes of deterioration, besides also determining a scientific methodology for routine inspection, monitoring, maintenance and conservation interventions required to ensure the long-term preservation of the Temples. It also introduces a Research Agenda which identifies the gaps in our current conservation knowledge and calls for study to be directed towards these lacunae. The research agenda is varied and is in itself designed to be inter-disciplinary, looking far afield at issues such as those environmental, biological, architectural, structural, hydrological, material, conservation, geological, museological, interpretational.

The Conservation Plan includes a Condition Assessment of all the Megalithic Temples, consisting of a methodical visual inspection and documentation of the deterioration typology of all the sites and their immediate surroundings. The committee evaluated and defined methodologies for each type of deterioration problem and assigned and monitored both routine and urgent conservation interventions that were needed. This Condition Assessment is now complete. This has been followed by a number of individual Method Statements for the execution of individual conservation related interventions, especially urgent ones related to sudden incidents such as collapses or vandalism. Another very important action by the Scientific Committee was the input given on materials and specifications for the construction of the protective shelters at the two important Megalithic sites of Haġar Qim (Fig.2) and Mnajdra [Cas-sar et al., 2011] and drafted a design brief for and reviewed concept designs of a similar protective shelter at a third megalithic site at Tarxien.

In preparation for the design and construction of the protective shelters, a one-year environmental monitoring study was commissioned to Italian experts from CNR-ISAC of Bologna through an EU funded project. This comprehensive study was intended to deepen knowledge on the deterioration factors that impinge on the already fragile material content of the Temples. The study included short environmental campaigns to study biological deposits, atmospheric aerosol and stone surface chemistry; infrared thermography; vibration
Continuous monitoring carried out included air relative humidity; air temperature; global radiometry; barometric pressure; and wind speed and direction. Specific studies relating to biological deposits, surface temperature as well as sea salt aerosols deposition studies continued to guide the Committee from a pre shelter scenario to a post shelter position.

The Committee has also evaluated and gave feedback and guidance on issues relating to the conservation of the Megalithic Temples, as well as environmental monitoring, biological surveys, hydrological studies, structural issues, and preservation of decorated megaliths.

6. Challenges

Even as approaches and strategies for the conservation of the megalithic temples have become more systematic and better resourced, the challenges that need to be addressed have also continued to evolve. Some of the challenges were evident from the outset, while others have emerged as projects unfolded. A key challenge that was foreseen in the first Conservation Plan for the Megalithic Temples was the development and implementation of method statements to address the material and structural vulnerabilities of the monuments. While the pointing of cracked megaliths to minimise water ingress has been successfully implemented over the past five years, methodologies for a number of other pressing interventions remain to be addressed. Foremost amongst these is the issue of how to deal with the exposed upper surface of the infill forming the core of the megalithic construction, and how to manage rainwater falling on this surface.

Another, perhaps even more intractable issue which is as yet unaddressed, is that presented by the loss of material from the same infill. Over the centuries, a substantial proportion of the infills has been lost, primarily through the action...
of rainwater that has washed out the fines, weakening the structure and contributing to collapse. One of the most critical instances of this is the south end of the façade of Ġgantija Temples, which stands over six metres high. Since 1996, the façade has been supported by scaffolding, rendered necessary by the weakening of the façade, primarily by the formation of voids within the structure. The ongoing debate on how best to restore the structural integrity of the façade is working through the ethical and archaeological issues of whether to partially dismantle and reassemble the façade, and the issue of how to replace the lost infill material to achieve the optimal balance between retrievability and structural stability. While the problems posed by each situation on the temples present their own distinctive characteristics which must be treated as sui generis, the methodology that is developed to address the challenge posed by the façade of Ġgantija is bound to be an important watershed that will inform subsequent interventions to address the problem of the lost infills.

Other challenges have emerged even as a result of the implementation of the Scientific Committee’s conservation strategy. The protective shelters have resulted in a substantial and demonstrable improvement in the environmental conditions prevailing in the sheltered areas, and ongoing monitoring continues to document these improvements. One variable which remains under discussion and under close scrutiny is that of salt migration and accumulation in and on the megaliths in the sheltered area. As the area around the shelters is still exposed to rainwater, movement of groundwater below the shelters may still be contributing to the migration of salts within megaliths in the sheltered area. A key challenge that needs to be addressed by the ongoing monitoring programme is to quantify and characterise this process. A related challenge, as more monitoring data accumulates, is to begin to distinguish between residual effects that may be related to the transition from an unsheltered to a sheltered state, and seasonal patterns that will continue to occur even after this transition.

The material realities of the shelters themselves are also posing new challenges. Maintenance cycles that would be a simple routine in an identical shelter over a shopping mall become extremely delicate operations when they take place over a fragile prehistoric World Heritage Site. The most complex maintenance cycle is the replacement of the shelter fabric, which is foreseen to take place every 25 years or so. As already discussed, this milestone was identified from the outset as the right time to take a periodic decision on whether the shelters should be retained, or whether new information or alternative solutions could lead to the conclusion that the shelters are no longer beneficial. When this strategy was charted out before the implementation of the shelters, there was no doubt in any of our minds that the periodic evaluation of whether to retain and renew the shelters would be based entirely on conservation considerations. Since implementation, however, it has come into focus that there will be another dimension that will have to be contended with and managed. The improvement in visitor comfort created by the shelters, though never itself one of the objectives of the project, has contributed significantly to the popularity of the shelters with the public [Grima et al., 2011]. The shelters have been embraced to such an extent that, should it be decided that they are
no longer needed from a conservation point of view, the site managers will face the challenge of persuading the public afresh, this time that the shelters need to be removed.

7. Conclusions
The experiences outlined above have underlined a number of key principles concerning interdisciplinary work. The first and most obvious is of course the need to have the whole range of relevant disciplines well represented on the team from as early a stage as possible. In practice, the range of specialisations that may be required are often less obvious at the outset, and a team may need to be expanded organically, as different issues come into focus. The second useful principle, therefore, is to have the flexibility to permit such iterations, whereby additional expertise may be roped into the team on a temporary or permanent basis.

The third point is perhaps the most crucial. A solution devised by three specialists working together is not the same as one where, for instance, a site manager or curator commissions separate studies from the same three specialists, each working separately. The whole, represented in this case by genuinely interdisciplinary work, is evidently greater than the sum of the parts. The flexibility to allow colleagues in other disciplines to inform one’s own work minimises the risk of blind spots in the result, allowing more robust and resilient solutions. Once again, in reality it may often be necessary to undergo some iterations to address issues that were not evident from the outset. Ongoing and auto-critical evaluation of progress and results, and openness to corrective action whenever necessary, should be built into working practices.

The third point leads us naturally to a fourth and final principle, concerning language and communication. Every profession has its own languages, terminology, established norms and practices, and inevitably, its assumptions and areas of weakness when applied to a new situation. As reviewed above, the preservation of the Megalithic Temples has certainly had no shortage of new situations, constantly presenting the team with very specific problems for which it was impossible to find close parallels. As a result, the mixture of highly specialised team members that needed to be brought together was a rather unusual one, which required interactions between professionals who had until then never had to work with these other disciplines. Picture, for instance, an archaeologist specialized in prehistory, explaining to a contractor’s structural engineer, specialised purely in the calculations of foundations for tensile membrane structures, why the design he has proposed is unacceptable because of its impact on the setting of the Temples. Working through such issues required considerable efforts at translation between the vocabularies, frames of reference, values and priorities of the different players, and in this case was in fact only possible because the core team had its own structural engineer who, being well-versed in both ‘languages’, could act as interpreter. Any colleagues setting out on a project requiring inputs from specialists who have limited experience of the cultural heritage setting would be well advised to have cross-disciplinary ‘interpreters’ of this kind, to minimise misunderstandings and avoidable iterations.
Notes

1 The sheltering project for Ħagar Qim and Mnajdra was funded through - ERDF 2004-2006 Structural Funds; Ħaġar Qim and Mnajdra Temples Conservation and Interpretation Project

2 The current project which includes Tarxien shelter - ERDF Cohesion Policy 2007-2013; Archaeological Heritage Conservation Project

3 Consiglio Nazionale delle Ricerche - Istituto di Scienze dell’Atmosfera e del Clima (CNR-ISAC) (National Research Council - Institute for Atmospheric Sciences and Climate)

4 One-year environmental monitoring programme was funded by - 2003 Pre-Accession Programme; Technical Assistance for the collection of environmental data at Ħagar Qim and Mnajdra

References


