



Malta Archaeological Review



THE ARCHAEOLOGICAL SOCIETY

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

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

Official address:

The Archaeological Society, Malta
c/o Department of Classics and Archaeology
University of Malta
Msida MSD 2080
MALTA

Application for membership and all correspondence should be addressed to:

The Hon. Secretary
Ms Ann Gingell Littlejohn B.A.(Hons), B.A.
Dar l-Irdoss
112, Triq il-Ħemel
Swieqi SWQ 3052
MALTA

secretary@archsoc.org.mt



For online membership, access website at:
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THE ARCHAEOLOGICAL SOCIETY

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■ This is the tenth issue of the *Malta Archaeological Review*, and the second one that I have the honour to edit on behalf of the Society. Readers will have noted that the quality of the publication has risen in leaps and bounds over the years. The first issue, produced in 1996, was a slim eight-pager but it contained within it the enthusiasm for Maltese archaeology that our founder president, Prof. Antony H.B. de Bono hoped the Society would convey to its members and the Maltese public more widely. We hope that we are still delivering with the same spirit. On behalf of readers I would like to take this opportunity to formally thank the previous editor, Patricia Camilleri for giving us six informative issues of the *Malta Archaeological Review* between 1999 and 2011, years in which she had a busy professional schedule at the University of Malta alongside the commitments of the Society of which she was also president between 2004 and 2010. Ann Gingell Littlejohn was, and remains, an invaluable deputy editor who is silently responsible for ensuring that the final product is of a very high standard and that ideas and results are expressed in plain language. Anton Bugeja and Maxine Anastasi continue to respond to calls of help about content and design promptly and efficiently.

■ The death in 2011 of Prof. John D. Evans and of Prof. Maria Pia Rossignani in 2013 is a blow to Maltese archaeology. Two scholars have kindly accepted our invitation to write an appreciation of their colleagues and the work that they accomplished in Malta during distinguished careers based in England and Italy respectively. We cannot fail to mention the sudden death of Prof. Klaus Schmidt (b. 1953) of the Deutsches Archäologisches Institut, Berlin, in July this year. Prof. Schmidt was a guest speaker of the Society in 2011 when he delivered a thought-provoking lecture about his excavations of the spectacular world-class monumental temple remains erected in the tenth millennium BC by

hunter-gatherers at the site of Göbekli Tepe in Turkey. This is indeed a sad loss for the world's archaeological community.

■ Readers will no doubt be aware that the application of scientific techniques to archaeology is throwing new light on many ancient problems. Indeed, many themes that recur in top science journals, like *Nature* and *Science*, often relating to topics concerning human origins, make it to local newspapers. In two of the articles in this issue, a different set of analyses has been put to good use in a discussion of prehistoric diet and of exchange. Although the results achieved in both cases might appear to some as insignificant in the larger scheme of things – as, for instance, if we were to compare them to the news, also carried in this issue, of a seventh-century Phoenician shipwreck discovered in Maltese territorial waters – we would like to emphasize that the value of such results lies in the ability to take interpretation to a higher level, often allowing archaeologists to establish facts. It is similar results that encourage us to think harder and explore new ideas.

■ Legislation is only as good as the attempts to enforce it. Unfortunately, blatant disregard for the provisions of the Cultural Heritage Act (2002) still makes news from time to time. Indeed, it appears that some religious orders do not seek the permission of the Church's Cultural Heritage Commission before intervening on cultural property owned by them. A case in point is the repainting of the apse of the cave church of St Leonard at Il-Lunzjata on the outskirts of Rabat, Malta, managed by the Carmelite Friars. In 2013 somebody decided to have the apse, built partly in ashlar and partly in wet-rubble, of this rare example of Late Medieval architecture covered with a ghastly painting (fresco?) depicting the Madonna and the saint (see illustration). Unfortunately, this act resulted in the complete obliteration of the traces of painted decoration of an early decorative scheme which



The apse of the cave-church of St Leonard (left) before re-decoration in 2013 (below). (Photographs reproduced by courtesy of Dr Keith Buhagiar [left] and Dr Anthony Charles [below]).



still survived on small areas of whitewash. The heritage value of this church has been well known for a while and one of our committee members, Dr Keith Buhagiar, has written and lectured extensively about it in the past (e.g. St. Leonard Cave Church, Lunzjata l/o Rabat, in A. BONANNO (ed.) 2008, *Malta and Sicily: Miscellaneous Research Projects* (KASA Project), DVD). We hope that this act does not form part of a grander scheme to turn the place into a tourist attraction and we hope that the Church authorities and the Superintendence of Cultural Heritage maintain an appropriate level of control in the presentation of the site and its landscape.

■ Change can be stressful at times. There has been a lot of talk lately of planned revisions by Government to the current cultural heritage legislation. It appears that these changes are not the result of a structured discussion amongst stakeholders but are what single entities would like to see to better their own situation or to see their concerns addressed. Although proposals may have been made with the best of intentions we foresee a problem in the ability to satisfy all wishes and views. While we wait for these changes to be made public and discussed in a national forum, the Society resolved to be pro-active and on 18th October this year brought together a number of institutional stakeholders to discuss the achievements of twenty years of archaeological practice in Malta and the many challenges that lie ahead. Some common concerns were made, not least the fact that increased surveillance of development being carried out by licensed archaeologists working under the direction of the office of the Superintendence of Cultural Heritage has led to an exponential rise in the number of archaeological discoveries: for instance, 550 monitoring briefs were issued between 2008 and 2011, and of the 248 cases followed in 2011 alone, 84 yielded discoveries worthy of examination and recording, an exercise paid for by the developer in the spirit of the European Convention on the Protection of the Archaeological Heritage (Valletta, 1992) to which Malta is party. Unfortunately, as with the case of other European countries, the state appears

hesitant to pass on the cost of study of the uncovered and/or recovered remains to the developer, as the same convention requires. With the workload currently borne by the Maltese state regulatory team, and its limited human resources, this effectively means that no knowledge is being generated, and if it is, that knowledge is not entering the public domain in any form or shape. This is clearly an impasse that needs resolving sooner rather than later as the backlog is increasing every year. It was good to hear the Minister's speech at the end of the seminar acknowledge this and related problems. Other countries have had to tackle such problems and models exist which we can follow with profit (e.g. G. COONEY, M. O'SULLIVAN, and L. DOWNEY 2006, *Archaeology 2020: Repositioning Archaeology in the Knowledge Society: A realistically achievable perspective*. Dublin: University College Dublin/The Heritage Council). Of course, there will always be the issue of sourcing the funds to pay for the study and analysis of the data recovered, especially where costly specialist input is required. We fail to comprehend why the heritage fund, for which provision is made in current legislation, has remained empty since its creation in 2002. In this regard, we welcome the recent announcement made by the Ministry of Justice, Culture and Local Government that tax breaks will be given to entrepreneurs who contribute to the fund. We sincerely hope that the revenue generated will not be used solely for the sort of eye-catching initiatives that political expediency often resorts to so that progress is seen to be made but, more importantly, we hope that the dissemination of knowledge generated by more than twenty years of active archaeological fieldwork on a finite resource is also considered and given top priority. Moreover, the purse holders will need reminding that studying and publication are a time-consuming undertaking that cannot be done on the cheap. It is our collective duty to support and facilitate initiatives that do it properly.

Nicholas Vella
Msida, 1 December 2014

SOCIETY ACTIVITIES

2010

20 January

Mr Joseph Magro Conti and Mr Kevin Borda
(MEPA)

Lecture: *Recent scheduling of items of the Antiquities List*

30 January

Dr Anton Bugeja (independent researcher)

Site visit: *The area of Qallilija, limits of Rabat, a large site rich in Punic tombs*

17 February

Ms Patricia Camilleri (independent researcher)

Lecture: *Paolo Francesco Bellanti (1851-1927) - the archaeologist, the man*

27 February

Dr Anton Bugeja, Ms Patricia Camilleri, and Ms Ann Gingell Littlejohn (independent researchers)

Site visit: *The Żurrieq area: the Punic building in the garden of the parish priest's house, the Xarolla funerary triclinium catacomb, and the ruins at Tal-Bakkari and Ta' Ġawhar*

13 March

Dr Malcolm Borg (independent researcher)

Site visit: *Corradino Military Prisons (British period)*

17 March

Ms Rebecca Farrugia (independent researcher)

Lecture: *Early Metallurgy in the Maltese islands*

13 April

Prof. Hector Williams (University of British Columbia)

Lecture: *Goddesses, Whores, Vampyres and Gladiators: Excavating Ancient Mytilene*

21 April

Ms Maxine Anastasi (University of Malta)

Site visit: *The double life of pots: pottery in Late Punic and Roman Malta*

24 April

Prof. Anthony Bonanno (University of Malta)

Site visit: *The rock-cut features, recognised as wine presses, in the Bingemma area*



Members of the Archaeological Society Malta near the Punic tower in Żurrieq, 27 February 2010. (Photograph by Anton Bugeja)

19 May

Ms Marcia Grima (Heritage Malta)

Lecture: *Museums and Community Engagement in Valletta's Revival*

22 May

Dr Stephen Spiteri (Restoration Directorate)

Site visit: *Fort Mosta*

7 July

Open day at the excavations carried out at Għar ix-Xiħ (Gozo) by a joint team from the University of Malta and the Superintendence of Cultural Heritage on behalf of the Mġarr ix-Xini Regional Park Project

4 August

Open day at the excavations carried out at Tal-Logġa (Gozo) by a team from the Superintendence of Cultural Heritage on behalf of the Mġarr ix-Xini Regional Park Project



Site visit to the rock-cut wine presses in Binġemma, 24 April 2010. (Photograph by Anton Bugeja)

27 October

Dr Dennis Mizzi (University of Malta)
Lecture: *Qumran and the Dead Sea Scrolls—60 years later*

30 October

Dr David Trump (former Curator, National Museum of Archaeology Malta)
Site visit: *Skorba temple, Mġarr*

17 November

Dr Timmy Gambin (Aurora Trust)
Lecture: *Deep Water Archaeology in Sicily – the recent discovery of Shipwrecks off the Aeolian Islands*

27 November

Prof. Anthony Bonanno (University of Malta)
Site visit: *Tarxien temples*

3 December

Dr John Schembri (University of Malta) and Mr Simon Farrugia (MEPA)

Lecture: *Blowin' In The Wind - Aeolian processes at Haġar Qim protective shelter*

2011

24 February

Dr Paul Reynolds (University of Barcelona)
Lecture: *Roman Beirut-Berytus: ceramics, cuisine and commerce*

26 February

Dr Nicholas Vella (University of Malta)
Site visit: *Kordin temples and the surrounding landscape context*

Wednesday 16 March

Ms Krista Paris (University of Malta)
Lecture: *The menhirs of prehistoric Sardinia*

26 March

Mr Charles Debono (National War Museum, Heritage Malta)

Site visit: *National War Museum*

13 April

Mr Brian Ayers (The Butrint Foundation, Norwich)

Lecture: *The Butrint World Heritage site in Albania*

7 May

Mr Joseph Magro Conti (MEPA)

Site visit: *The carts ruts at Għar il-Kbir*

18 May

Ms Bernardette Mercieca and Mr Christian Mifsud (Superintendence of Cultural Heritage)

Lecture: *The Archaeology of Saint Paul's Catacombs in Rabat: Investigation and documentation of catacombs 10, 12, 13, 14 and 17A*

9 July

A conducted tour of the excavations at the Żejtun Roman villa site undertaken by the Department of Classics and Archaeology, University of Malta

12 October

Prof. Christophe Morhange (Université d'Aix-Marseille), Dr Nick Marriner (Faculty Member, Institut National des Sciences de l'Univers—INSU, CNRS—Centre National de la recherche scientifique), and Dr Timmy Gambin (University of Malta and Aurora Trust)

Lecture: *The geo-archaeology of Malta: old sites, new data*

9 November

Prof. Frank Sear (University of Melbourne)

Lecture: *A day in the life of Pompeii*

26 November


Dr Anton Bugeja (independent researcher)

Site visit: *The western Marfa ridge*

7 December

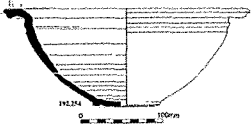
Dr Timmy Gambin (University of Malta and Aurora Trust)

Lecture: *The discovery of ancient shipwrecks off Ponza island*



THE ARCHAEOLOGICAL SOCIETY
MALTA

Prof. Paul Reynolds PhD, FSA
ICREA Research Professor, ERAAUB, University of Barcelona*

**ROMAN BEIRUT-BERYTUS:
CERAMICS, CUISINE
AND COMMERCE**




18.00, Thursday, 24th February 2011
*Superintendence of Cultural Heritage
173, St Christopher Street
Valletta*


THE ARCHAEOLOGICAL SOCIETY
MALTA

Prof. Frank Sear
*Professorial Fellow,
The School of Philosophical and Historical Studies,
University of Melbourne, Australia*

will be delivering a lecture entitled

**A DAY IN
THE LIFE OF POMPEII**



18.00, Wednesday 9th November 2011
*Superintendence of Cultural Heritage
173, St Christopher Street
Valletta*

Professor John Davies Evans, 1925-2011

David H. Trump

On reaching Malta in April 1954, having asked John Evans, a junior research fellow of my college in Cambridge, if I could join his dig there, I found him in the National Museum in jubilant mood. He had been producing a catalogue of finds and sites for that museum, through the Malta University and the Colonial Development Welfare Fund. Although his professors at Cambridge, Dorothy Garrod and then Grahame Clark, were neither very interested in the Mediterranean, Dr Glyn Daniel, senior lecturer, had sparked his interest in that area, as he later did mine, and a first class degree in archaeology made him an ideal person for the job.

He had taken the opportunity to work out a chronological sequence of pottery phases, based on typology and his knowledge of pottery from other Mediterranean areas. The day before I arrived, in a small trench at Haġar Qim he had confirmed not only the validity but also the correct ordering of the two major phases he had named after the temple complexes of Ġgantija and Tarxien respectively.

Where Sir Temi Zammit had distinguished Neolithic and Bronze Age periods in 1915-17 at Tarxien, John had now a sequence of five Neolithic and three Bronze Age phases, an enormous leap forward and a basis for all further research on Maltese prehistory.

We were joined by Prof. Stuart Piggott from Edinburgh and crossed to Gozo to investigate the Ġgantija temples. Here John himself used his work on the pottery to establish the development of Malta's extraordinary megalithic temples, a sequence which is still accepted without question.

His pottery sequence he published in the *Proceedings of the Prehistoric Society*, 1953. He went on to write his popular work, *Malta*, in Thames and Hudson's Ancient Peoples and Places series in 1959. By that time I was even deeper in his debt. As well as enthusing me for Malta, he had alerted me

to its National Museum's looking for a Curator of Archaeology in 1958, which came at a very opportune moment in my career.

One of my duties was to train a Maltese to replace me at the end of my five years. When John told me of a plan to bring British university students out on a study visit to Lipari at the invitation of Prof. Bernabò Brea of Syracuse, I urged how useful it would be to Francis Mallia to participate, and accompanied him there. This gave me not only my only photograph of John, but the party included also, as well as Glyn Daniel and Stuart Piggott, one Bridget Wilson, an Edinburgh undergraduate (Fig. 1). A little over two years later, she joined me in Malta as Mrs David Trump.

During my five years in the curatorship, we obtained confirmation of John's pottery sequence from the stratigraphy we discovered at Skorba in 1961-1963, with the addition of two new phases and a minor alteration. My worst moment of that dig was when I broke the news to John in his office in the Institute of Archaeology in London that he had two of his phases in the wrong order. The typological argument was faultless, but over-ruled by the stratigraphy. It speaks highly for his scholarship that his reaction was not to dispute this but to say, 'So I got it wrong. Thank you for putting it right'. We were also able to provide radiocarbon dates, and here there were much bigger changes to be made to his suggested chronology. His estimates were made at the moment when the shortest of chronologies was in vogue, but again no possible blame could be attached to him for a figure far too low. These new dates were in time to be included in his major academic publication, *The Prehistoric Antiquities of the Maltese Islands* of 1971. This is still the standard reference work on the subject. I call upon my now somewhat battered copy frequently. His carefully surveyed temple plans were standard until supplemented by 3D laser technology.

As well as his ground-breaking work on the prehistory of Malta, this was only the first of his three major contributions to archaeology. He went on in 1958-60 to excavate beneath the central courtyard of the Minoan palace at Knossos on Crete, dug by Sir Arthur Evans, no relation, in 1900-5. Here he revealed a long sequence of Neolithic levels. In 1964-5 he also excavated a Neolithic settlement on Saliagos, a small island off Paros in the Aegean.

Shortly after leaving Malta, in 1956 he was appointed Professor of European Archaeology at the Institute of Archaeology, London University, becoming its Director in 1975 until his retirement in 1989 (Fig. 2). He not only did brilliant work there, but served nobly on many national and international committees. Few archaeologists, however skilled in their own field, have such great administrative capabilities.

There he was instrumental in getting Francis Mallia, appointed to train as a replacement for me in the Curatorship of Archaeology in the Museum Department, onto the postgraduate Diploma in Archaeology course at the Institute, although Frans, simply a draughtsman at the Public Works Department, had no first degree. John retained his interest in Malta, to the end of his life, warmly welcoming and gratefully accepting my reports of new results from the islands, even when, as at Skorba, they contradicted his own. In this way I could to some extent acknowledge and repay my personal indebtedness to him. However, it is not only I but everyone interested in Maltese prehistory, whether professional archaeologist, native Maltese or simply a tourist visitor, who also owe him every respect and gratitude for his major contribution to the subject, on which all later work is firmly based.

David H. Trump
email: d.b.trump@ntlworld.com



Figure 1. Study tour to Lipari, May 1960. Prof. Luigi Bernarò Brea stands to the left, two to his right is Bridget Wilson (later Trump), Charles Higham (later prof. at Otago, New Zealand), behind and between them John Evans, to Charles's right David Trump, then Francis Mallia. Professors Glyn Daniel and Stuart Piggott are off the picture to the right. (Photograph reproduced courtesy of David Trump.)

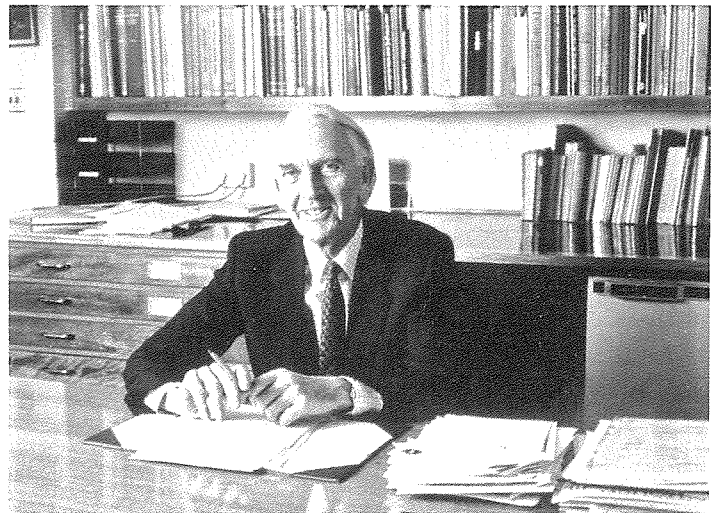


Figure 2. John Davies Evans OBE (22 January 1925 – 4 July 2011) at his desk at the Institute of Archaeology, London. (Photograph by Stuart Laidlaw reproduced by courtesy of UCL Institute of Archaeology.)

Professor Maria Pia Rossignani, 1940-2013

Grazia Semeraro



Figure 1. Maria Pia Rossignani at Tas-Silġ, 2011. (Photograph reproduced courtesy of Archivio Missione Italiana a Malta.)

Maria Pia Rossignani, Professor of Classical Archaeology at the Università Cattolica del Sacro Cuore in Milan and director of the Italian Archaeological Mission in Malta, passed away on 4 May 2013 (Fig. 1). Born on 8 September 1940, she was one of the most remarkable figures in Italian archaeology. After graduating in 1962, defending the thesis 'Eighteenth-century restoration of the paintings of Herculaneum and Pompeii' before Professor Michelangelo Cagiano de Azevedo, she embarked on an intense academic career which saw her at the forefront of numerous scientific research projects in Italy, Malta and Turkey.

She spent most of her academic life at the Università Cattolica and from the start the level of her research was characterised by the highest standards, sustained by rigorous methodology based on a thorough investigation of artefacts and ancient contexts. Appointed Professor in 1990, she taught at the University of Aquila for a few years and returned to Milan and her old University in 1993. In Milan she initiated numerous didactic and scientific projects, inspired by her passion for research and by her generous commitment to the formation of young people who were ever at the centre of her study projects and of her teaching life. This led to the setting up in 1997 of the Scuola di Specializzazione in Archeologia at the Università Cattolica del Sacro Cuore which she continued to head up to 2010. She was also responsible

Il 4 Maggio 2013 è mancata Maria Pia Rossignani, docente di Archeologia Classica presso l'Università Cattolica del Sacro Cuore di Milano e direttore della Missione Archeologica Italiana a Malta. Nata l'8 Settembre del 1940, è stata una delle figure più significative dell'archeologia italiana. Dopo la laurea conseguita nel 1962, discutendo una tesi su 'I restauri settecenteschi ai dipinti di Ercolano e Pompei' con il prof. Michelangelo Cagiano de Azevedo, aveva intrapreso una intensa carriera accademica che l'ha vista protagonista di numerosi progetti di ricerca scientifica, sia in Italia che a Malta ed in Turchia.

Presso l'Ateneo milanese si è svolta la maggior parte della sua vita di studiosa, caratterizzata fin dall'inizio dall'elevato profilo delle sue ricerche, sostenute da una metodologia rigorosa e fondata sull'indagine filologica dei manufatti e dei contesti antichi. Diventata Professore Ordinario nel 1990, aveva insegnato per alcuni anni nell'Università di L'Aquila, per poi tornare, nel 1993, a Milano, nella sua Università. Qui aveva dato vita a tantissime iniziative didattiche e scientifiche, animate dalla sua passione per la ricerca e dal suo impegno generoso nella formazione dei più giovani, sempre al centro dei suoi progetti di studio e della sua attività di docente. Da tali premesse era nato, nel 1997, il progetto di istituire, presso l'Università Cattolica del Sacro Cuore, la Scuola di Specializzazione in Archeologia, da

for launching a doctorate in “The archaeology of transformation processes: ancient and medieval societies”, which she coordinated with four other Italian universities (Lecce, Trieste, Urbino and Foggia).

Throughout her career, her attention to the methodologies of the study of stratigraphic contexts through practical archaeology in the field represents an important and particularly significant feature, especially when put into the context of the history of archaeological research on the great excavation sites of the Mediterranean. Her earliest youthful experiences were in fact gleaned in Malta through her involvement as early as 1964 in the excavations of the Italian Archaeological Mission, one of the most important research projects of the 1960s, which saw many young researchers engaged in an intense season of scientific activity. It was here that her scholarly and friendly association with Antonia Ciasca was born, and continued to endure over time.

Northern Italy and Milan were at the centre of other projects that took off in the years that followed, from investigations at Luni, with Antonio Frova, to the undertaking of excavations in the courtyards of the Università Cattolica, where the group coordinated by Maria Pia Rossignani and Silvia Lusuardi promoted one of the most important Italian projects on urban archaeology. This was a model of archaeological inquiry because of its operational methods and for the methodological quality of the interventions. The suburb of *Mediolanum*, with its manufacturing establishments and Roman necropolis, was systematically investigated and the study of material from the site was the subject of several undergraduate and masters theses and doctorates, before being brought together in a series of publications dedicated to this important research project.

A great expert in Roman architecture, Maria Pia Rossignani was in those years called upon to collaborate with the Italian Archaeological Mission in Turkey in a study of the magnificent architecture of the Hierapolis of Phrygia, dedicating herself to the study of the stoa-basilica of the agora, in close collaboration with the stratigraphic excavation project directed by Francesco D'Andria. In her analysis of this imposing monument, one of the masterpieces of Roman Imperial architecture, is to be found not only the entire significance of her method of study, based on an analysis of every detail, but also her deep knowledge of ancient architecture. These elements were combined with her special ability to determine

Lei diretta fino al 2010, ed il dottorato in “Archeologia dei processi di trasformazione. Le società antiche e medievali” che coordinò coinvolgendo altre 4 Università italiane (Lecce, Trieste, Urbino e Foggia).

L'attenzione verso le metodologie di studio dei contesti stratigrafici, attraverso la pratica archeologica sul campo rappresenta, lungo tutto l'arco della sua carriera, un aspetto rilevante e particolarmente significativo, soprattutto se messo in relazione con la storia della ricerca archeologica nei grandi cantieri di scavo del Mediterraneo.

Le prime esperienze giovanili la vedono, infatti, impegnata a Malta, dove collabora fin dal 1964 agli scavi della Missione Archeologica Italiana, uno dei più importanti progetti di ricerca degli anni 60, che coinvolse tanti giovani studiosi in una intensa stagione di attività scientifica. Nasce qui il sodalizio scientifico ed umano con Antonia Ciasca, che continuerà nel tempo.

L'Italia settentrionale e Milano sono al centro degli altri progetti che si dipanano negli anni successivi, dalle ricerche a Luni, insieme ad Antonio Frova, fino all'impresa di scavo nei cortili dell'Università Cattolica, dove il gruppo coordinato da Maria Pia Rossignani e Silvia Lusuardi promuove uno dei più importanti progetti italiani di archeologia urbana, un modello di indagine archeologica per le modalità operative e per la qualità metodologica degli interventi. Il suburbio di Mediolanum, con i suoi impianti produttivi e la necropoli romana viene sistematicamente indagato e lo studio dei materiali diventerà oggetto di numerose tesi di laurea, specializzazione e dottorato, prima di confluire nella serie di pubblicazioni dedicate a questa rilevante impresa di ricerca.

Grande esperta di architettura romana, Maria Pia Rossignani viene chiamata in quegli anni a collaborare con la Missione Archeologica Italiana in Turchia nello studio delle magnifiche architetture di Hierapolis di Frigia, dedicandosi allo studio della stoa-basilica dell'agora, in stretta collaborazione con il progetto di scavo stratigrafico diretto da Francesco D'Andria. Nell'analisi di questo imponente monumento, uno dei capolavori dell'architettura romana imperiale, si esprime non solo tutto il valore del suo metodo di studio, basato sull'analisi di ogni dettaglio, ma anche la sua profonda conoscenza della cultura architettonica antica, unita alla speciale capacità di riconoscere intuitivamente le soluzioni più adeguate ai numerosi problemi di ricostruzione posti da monumenti complessi e di difficile lettura.

intuitively the most suitable solutions to the many problems of reconstruction posed by complex, hard-to-read monuments.

A cultured and refined scholar of the ancient world, Maria Pia Rossignani was a person who was extremely sensitive to and solicitous of others, imbued with profound feelings of solidarity that marked her daily actions, her human relations and her generous commitment to social and political life. Her involvement with the reconstruction work that followed the 1976 earthquake in Friuli and the battle that she undertook to save the precious cultural patrimony of the town are one of the examples that prove her civic commitment and the moral force that drove her. In the reconstruction of the Cathedral of Venzone, reduced to ruins, she changed her work method and, together with her students, set in motion a long and exhausting catalogue and recognition of single fragments. On this basis it was then possible to reconstruct the entire structure, giving back to the community a monument of high artistic value as well as a strong symbol of local identity.

She had a special place in her life for Malta, not only as a result of the scientific aspects of her commitment, even more intense when she took over direction of the Missione Archeologica Italiana in 2001, but also because she was bound to Malta by a deep relationship brought about through a love of its places, its landscape, the sea, and above all the light that permeated the island, and its colours. It was a strongly felt bond with people, with so many Maltese friends who appreciated her professional abilities and her great human qualities. Continuing the work started by Antonia Ciasca, Maria Pia Rossignani dedicated herself during this time not only to scientific research but also to the attempt to get to grips with the delicate problems of conservation of the archaeological sites of Tas-Silġ and San Pawl Milqi. This she did through a programme of intervention on the remains, designed to stop degradation and to offer them the widest possible protection, in view of long-term action that would allow the sites to be better enjoyed by the general public. She applied herself to intense research activity that led her to important achievements related, for example, to the artistic reconstruction of the Tas-Silġ sanctuary in the Punic and Republican periods.

The new work campaign at Tas-Silġ coincided, for Maria Pia Rossignani, with the commitment to share the research experience as widely as possible, as demonstrated by the broad participation of so many

Colta e raffinata studiosa del mondo antico, Maria Pia Rossignani era una persona estremamente sensibile ed attenta agli altri, animata da sentimenti profondi di solidarietà che segnavano il suo agire quotidiano, le sue relazioni umane, il suo impegno generoso nella vita sociale e politica. Il coinvolgimento nell'opera di ricostruzione successiva al terremoto del 1976 in Friuli e la battaglia intrapresa per salvarne il prezioso patrimonio culturale sono uno degli esempi del suo impegno civile e della forza morale che la animava. Nella ricostruzione del Duomo di Venzone, ridotto ad una immane macera, riversò il suo metodo di lavoro, avviando insieme ai suoi allievi una lunga e faticosa opera di catalogazione e riconoscimento dei singoli frammenti: su questa base fu possibile recuperare l'intera struttura, restituendo alla comunità un monumento di alto valore artistico, ma anche un simbolo di forte valenza identitaria.

Un posto speciale nella sua vita è stato rivestito da Malta, non solo per gli aspetti scientifici del suo impegno, fattosi particolarmente intenso da quando, nel 2001, aveva assunto la direzione della Missione Archeologica Italiana. A Malta era legata da una relazione profonda, fatta di amore per i luoghi, per il paesaggio, il mare, e soprattutto la luce che avvolge l'isola, e i suoi colori. Era un legame molto sentito con le persone, con i tanti amici maltesi che ne apprezzavano la capacità professionale e le grandi qualità umane. Continuando il lavoro avviato con Antonia Ciasca, Maria Pia Rossignani si è dedicata in questi anni non solo alla ricerca scientifica, ma anche al tentativo di affrontare i delicati problemi di conservazione posti dalle aree archeologiche di Tas-Silġ e San Paolo Milqi, attraverso un programma di intervento sulle strutture finalizzato a fermarne il degrado e a proteggerle il più possibile, in vista di un'azione di più ampio respiro che potesse permetterne una maggiore fruizione pubblica. Molto intensa è stata la sua attività di ricerca che ha permesso importanti acquisizioni relative, ad esempio, alla ricostruzione del santuario di Tas-Silġ in età punica e repubblicana. Per Maria Pia Rossignani questa nuova stagione di lavori a Tas-Silġ è coincisa con l'impegno di rendere il più possibile condivisa l'esperienza della ricerca, come mostrano l'ampia partecipazione alla Missione da parte di tanti colleghi e giovani ricercatori. Del resto la capacità di coinvolgere, trasmettendo la

colleagues and young researchers in the Mission. Furthermore her capacity to involve others, to share her passion for research, and her energy to pursue it were some of the most significant achievements of her teaching career. Her objective during her work in Malta, and one which she stuck to tenaciously, was to set up a research group which could master the complex questions raised by research at Tas-Silġ. Thanks to this effort she succeeded in setting in motion the project of editing the final report on the Tas-Silġ excavations, a project that she believed very strongly in and one which she was working very hard on.

The energy and enthusiasm, passion and joy that research can bring, great human generosity and intellectual honesty: these are qualities that we all associate with our memories of her and which we will endeavour to honour, bringing to fruition the commitments that she had undertaken. And we hope to do so, continuing to work as though she were still with us, cheering us on in her happy and smiling way.

Translated by
Ann Gingell Littlejohn
ann.gingell-littlejohn@um.edu.mt

passione per la ricerca, e l'energia per portarla avanti, è stata una delle cifre più significative del suo magistero. Costruire un gruppo di ricerca che potesse dominare le complesse questioni poste dalla ricerca a Tas-Silġ è stato l'obiettivo perseguito tenacemente nel corso del suo lavoro a Malta. Grazie a questo sforzo era riuscita ad avviare il progetto di redazione del rapporto finale sugli scavi di Tas-Silġ, un progetto a cui teneva moltissimo e a cui stava lavorando intensamente.

L'energia e l'entusiasmo, la passione e la gioia che la ricerca può dare, la grande generosità umana e l'onestà intellettuale: sono gli aspetti che tutti noi associamo al suo ricordo e che cercheremo di onorare, portando a compimento gli impegni che aveva assunto. E speriamo di farlo, continuando ad operare come se fosse ancora fra noi, a rallegrarci con il suo fare allegro e sorridente.

Grazia SEMERARO
Direttore, Missione Archeologica Italiana a Malta,
Dipartimento di Beni Culturali
Università del Salento, Lecce, ITALY
grazia.semeraro@unisalento.it

Biomolecular and isotopic characterisation of lipid residues absorbed in Impressed Wares from the Early Neolithic village of Skorba, Malta

Cynthianne Debono Spiteri and Oliver Craig

Organic residue analysis (ORA) was used to characterise the lipid content of Impressed Ware vessels recovered from the Early Neolithic village of Skorba, Malta. ORA utilises both chromatographic and isotopic analytical techniques, and provides direct evidence for the function of ceramic vessels analysed. Lipid residues were interpreted against authentic reference fats of Mediterranean origin, and in light of the archaeological data available. The results showed that lipid yields were generally low, however direct evidence for the processing of an admixture comprising ruminant fat and marine oil was obtained in a vessel dated to the Early Neolithic period. This investigation also tests the feasibility of carrying out ORA on ceramic vessels recovered from Maltese archaeological contexts.

Background to the problem

The first archaeological evidence for human settlement in Malta dates to around 5000 BC, when Sicilian farmers are thought to have crossed the channel bringing with them various aspects of the Neolithic, including pottery and domesticates (Trump 2002). Good weather permitting, both islands can be easily sighted, with better visual contact being made from the island of Gozo (Pace 2004). Archaeological remains dating to this period have been retrieved from the caves of Għar Dalam (Malta) and Għajn Abdul (Gozo), and the Neolithic village of Skorba (Mgarr, Malta), which is the only Neolithic village uncovered on the islands to date. The remains of a wall were found, indicating a ditched enclosure, however extensive investigations have been limited due to the subsequent building of a megalithic temple structure above the village. Pace (2004) suggested that perhaps other such scenarios might have existed in Malta, hence by the Għar Dalam phase, the islands may have been populated by other such settlements, which in later centuries may or may not have been developed into megalithic monuments.

To date, archaeological and genetic studies support a Levantine origin for agrarian practices and domestication (e.g. Buiford and Townsend 2006; Luikart *et al.* 2006; Zeder 2011). Their subsequent

spread across the Mediterranean has been widely disputed (Ammerman and Cavalli-Sforza 1984; Barker 1985; Zilhão 2001). The current model proposed to explain the expansion of farming in this region suggests a punctuated event, brought about by pioneer seafaring farmers, who spread rapidly westwards from the Levant area (Zilhão 2001). At this time, characteristic Impressed/Cardial pottery and domesticates appear simultaneously on Mediterranean coastal sites. Pottery has for a long time been perceived as an indicator of agrarian settlements, in particular because of the assumption that the earliest ceramic vessels were produced and used by early farmers, thus implying that the spread of pottery and farming was linked (Jordan and Zvelebil 2010b). Archaeological research has shown that this is not necessarily the case; for example, in Japan, China and the Russian Far East, pottery vessels were used millennia before the onset of plant and animal husbandry (e.g. Aikens 1995; Jordan and Zvelebil 2010a and references therein), and similarly in North Africa, agriculture appears two or three thousand years after the beginning of pottery production (Close 1995). On the other hand, evidence for agrarian practices in the Levant occurs well before the earliest indications for pottery production (Moore 1995). The Mediterranean makes an interesting comparison. Current data shows that during the transition to

agriculture in the eastern Mediterranean, evidence that aceramic communities utilised domestic taxa has been found (e.g. Perlès 2001), while pottery has also been retrieved from contexts associated with purely wild taxa (e.g. Forenbaier and Miracle 2005). Yet excavations in the central and western Mediterranean more consistently show a simultaneous introduction of domesticates and pottery (e.g. Trump 1966, Muntoni, 2009), which appear to have spread rapidly westwards as a package (Zilhão, 2001).

Characterising the absorbed lipid content of ceramic vessels using organic residue analysis (ORA) provides an excellent opportunity to directly determine vessel use. ORA is a well-established technique which has been routinely used over the past two decades to characterise a wide range of animal products (e.g. animal adipose, ruminant dairy fats and marine oils), plant oils and epicuticular waxes, beeswax, bitumen, resins, and birch bark tar (see reviews Evershed 2008b; Debono Spiteri *et al.* 2011; Regert 2011). The premise for using ORA is that when animal and plant products are processed in unglazed ceramics, the heat generated causes fatty components to become absorbed within the walls of ceramic vessels. Lipid residues in charred visible crusts, which are sometimes found adhering to the surface of ceramic vessels, can also be similarly extracted and characterised (Craig *et al.* 2013). By quantifying lipid yields along the profile of the vessels tested, the cooking method can also be identified (Charters *et al.* 1993). Lipid extracts are analysed using Gas Chromatography (GC), which separates out and quantifies the lipid constituents present in the extracted residue, and GC-Mass Spectrometry (GC-MS), which provides structural information on the lipids present, allowing a preliminary identification of the original fatty source to be made. In the absence of specific biomarkers, it is difficult to distinguish between different types of fat, in particular ruminant and non-ruminant adipose, and ruminant dairy fats, because the lipid profiles of these degraded fats are very similar. Another technique, GC-combustion-Isotope Ratio MS (GC-c-IRMS), is applied. GC-c-IRMS measures the isotopic ratios of individual compounds within a mixture, in this case the $^{13}\text{C}/^{12}\text{C}$ of palmitic ($\text{C}_{16:0}$) and stearic ($\text{C}_{18:0}$) fatty acids, denoted as $\delta^{13}\text{C}$ values. The $\delta^{13}\text{C}$ measurements of these two fatty acids vary in different fatty products because of variation in the way they are biosynthesised and routed within the organism, which in turn, allows different fats to be categorically distinguished (Evershed *et al.* 2002). $\text{C}_{16:0}$

and $\text{C}_{18:0}$ fatty acids are present in all living organisms, their $\delta^{13}\text{C}$ values are not affected by diagenesis over archaeological timescales (Evershed *et al.* 1999), and they are readily extractable from prehistoric pottery, making these two fatty acids excellent compounds to target for GC-c-IRMS analysis.

The research presented here is part of a wider study in which 301 Impressed/Cardial Ware vessels recovered from 14 Early to Middle Neolithic sites in the Mediterranean were tested (Debono Spiteri 2012), primarily to re-evaluate the role of Impressed/Cardial Wares at the transition to agriculture. This paper focuses on the results obtained from the analysis of 16 Impressed Ware vessels collected from Early Neolithic contexts at Skorba, and (i) addresses: the feasibility of applying ORA to pottery vessels recovered from the Maltese archaeological record in terms of lipid preservation; (ii) investigates the content of the selected Early Neolithic vessels, and therefore obtain direct evidence for their function; (iii) informs on the culinary practices of the first settlers on the islands.

The site

The Neolithic village of Skorba is thought to have been established by 5000 BC (Trump 2008). The site lies on a hill overlooking Żebbiegħ, in the north-west of Malta (Fig. 1). Valleys located to the north and south of the site provided good arable soil, with a freshwater spring in the former and easy access to the coast. Revised calibrated radiocarbon dates suggest that the Neolithic took over a millennium to develop, and is subdivided into three phases: Għar Dalam (GħD) and Grey Skorba (GSk) which overlap (5500-4100 Cal. BC), and Red Skorba (RSk, 4350-3650 Cal. BC) (Fenech 2007). The structures associated with the Neolithic village include a hut and an 11m wall, founded firmly in the rock and dated to the first level of occupation on the islands (GħD), a GSk phase wall, and two huts built during the RSk phase. During the Temple Period, around 3500 BC, a standard early three-apsed temple was built on the site, but the extent to which this structure and later additions affected the village is still unknown (Trump 1966). Ploughing over the years has led to further destruction of the archaeological structures, however what remains provides evidence for a flourishing Neolithic village. The site was excavated between 1961 and 1963 (Trump 1966).

Materials and method

Sherds were selected from domestic contexts and comprised a selection of rims, bases and body fragments from ceramic vessels associated with cooking, serving and perhaps storage of food commodities (Table 1). Sampling was carried out using a Dremmel modelling drill with a tungsten bit. About 2g of ceramic powder was drilled from the internal surface of each sherd to a depth of around 4mm, discarding the first layer to remove possible contamination introduced by handling and contact with plastic. External surfaces were also sampled to test for exogenous contamination. The ceramic powder was accurately weighed and 1µg tetratricosane was added as an internal standard for quantification purposes. Lipids were extracted three times by sonicating in a mixture of dichloromethane and methanol (2:1; v:v) (HPLC grade; Fischer). Following centrifugation, the solvent was pipetted off into clean screw-capped vials, then evaporated under a gentle stream of nitrogen and mild heating to obtain the total lipid extract (TLE), which was then partitioned (50%). Prior to High Temperature-GC (HT-GC) and GC-MS analyses, one half of the partitioned lipid extracts was derivatised using N,O-bis(trimethylsilyl)trifluoroacetamide (BSTFA) with 1% trimethylchlorosilane (TMCS) (4 drops; 70°C; 1 hour).

One sample (SKR-16I) contained sufficient C_{16:0} and C_{18:0} fatty acids for GC-c-IRMS analysis. To release esterified fatty acids, the remaining TLE was saponified by adding 0.5M sodium hydroxide solution made up in a methanol and water solution (9:1, v:v), and heating at 70°C for 1 hour. The samples were allowed to cool, then neutralised. The lipids were extracted into hexane (Fischer; HPLC Grade), and the solvent was gently evaporated. Saponification was also carried out on a selection of the extracted ceramic powder samples, to analyse the 'bound' lipid fraction not released by solvent extraction.

Fatty acid methyl esters (FAMES) were prepared using 200µL of Boron trifluoride methanol solution (14%; Sigma Life Science) and heating for 1 hour at 70°C. The FAMES were extracted into hexane and the solvent reduced. C_{16:0} and C_{18:0} fatty acid standards of known carbon isotopic composition were methylated alongside the sample, and were later used to correct the δ¹³C values obtained for the carbon atom added during methylation. The sample was analysed using GC and GC-c-IRMS.

Results

Lipid yields were considered significant if more than 5µg of lipid per gram of sherd (µg g⁻¹) were obtained, which ensured that archaeological lipid profiles could be securely distinguished from background contamination (Evershed 2008a). All but one of the 16 samples analysed contained negligible (<5 µg g⁻¹) amounts of absorbed lipid residue (Table 1), and comprised mainly traces of fatty acids and alkanes, probably introduced from the burial environment as they are consistent, in lipid profile and quantification, with the five external sherds analysed. Saponification of the extracted ceramic powder to release the 'bound' lipid fraction also produced negligible results. Sample SKR-16I was obtained from the interior surface of a vessel dated to the GhD phase, whose shape could not be identified. The fabric was black, coarse and uneven, and had numerous large, black and white inclusions. GC-MS analysis of the lipid extracted from SKR-16I is consistent with a ruminant fat. It comprised C_{16:0} and C_{18:0} fatty acids, the latter being more abundant, indicating an animal fat. The presence of C_{15:0} and C_{17:0}, produced by microorganisms in the rumen, suggest a ruminant fat, while the short chain fatty acids (<C_{12:0}) identified are indicative of a dairy fat (Fig. 2). A series of diacylglycerols was present, indicating hydrolysis of triacylglycerols which were absent when the sample was run on HT-GC. Two long-chain ketones, derived from the condensation of fatty acids during heating, were present and are indicative of cooking (criteria consistent with Raven *et al.* 1997).

GC-c-IRMS analysis of SKR-16I showed a Δ¹³C value of -3.1‰, which is consistent with a ruminant fat, possibly, but not unequivocally a dairy residue (Fig. 3). The δ¹³C value of the C_{16:0} fatty acid is quite high, plotting within the isotopic range denoting marine oils. This can be due to contribution from C₄ vegetation (e.g. maize or sorghum), or marine oil to the pot content. C₄ plants had not yet been introduced in the Mediterranean during the Neolithic (Hunt *et al.* 2008), so in their absence this residue may potentially represent a mixture comprising ruminant fat and marine oil, possibly introduced during sequential cooking episodes. However, i) marine fish biomarkers were not present in the lipid profile, either because they did not survive, or because fish had not been processed in the pot in the first place, and ii) fish bones were not recorded in the archaeological deposit. Hence a marine input cannot be securely suggested.

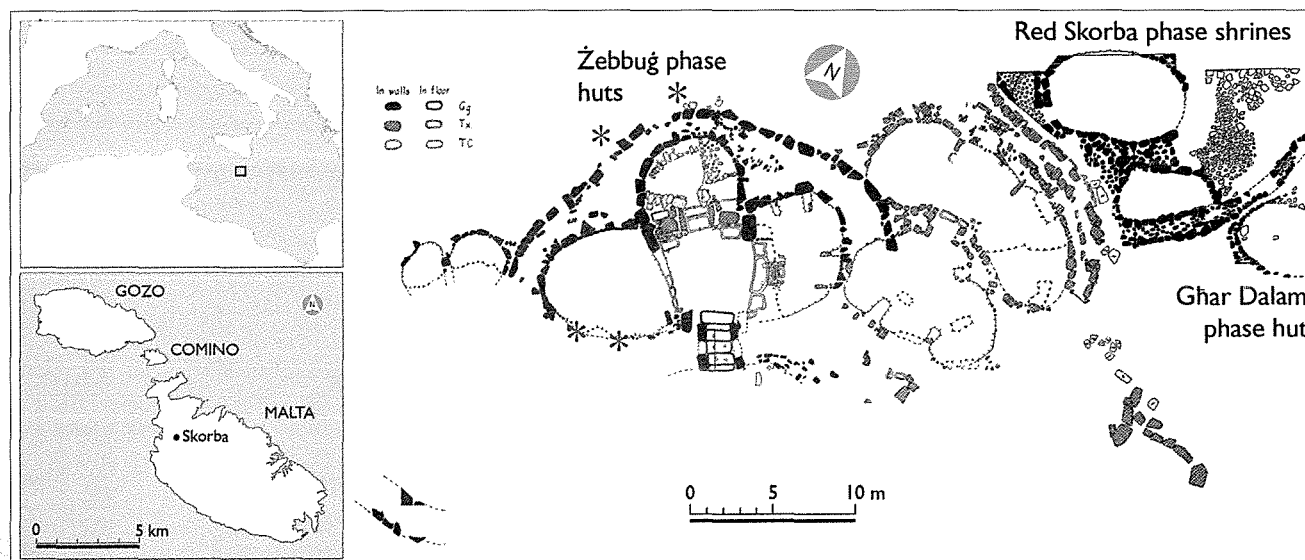


Figure 1. Plan of Skorba showing the main features pertaining to the Neolithic village and the later apsed temple (after Trump 2002: Figures 3 and 10; Map courtesy of Heritage Malta. [*: denotes the location where the pottery vessels sampled were recovered]). Redrawn by Maxine Anastasi).

Discussion

Organic residues are more likely to survive in waterlogged and desiccated environments, rather than in areas where seasonal variations alternate between heavy rainfall and hot dry spells, which is more consistent with the Mediterranean climate (complementing results obtained by Evershed *et al.* 2008; Gregg *et al.* 2009). Furthermore, the calcareous burial deposits, characteristic of the geology of the Mediterranean, do not favour the survival of lipid residues, mainly because they support a richer microbial population than acidic environments, therefore enhancing lipid degradation (Moucawi *et al.* 1981). Low lipid yields pose two major problems: (i) they preclude a secure characterisation of residues because of heightened signals from background contamination, and (ii) negligible residues do not necessarily represent advanced phases of lipid degradation, but could also be produced as a result of the function assigned to individual vessels, which need not have been conducive to the formation of an absorbed residue. Distinguishing between the two using ORA is difficult. This however, does not preclude the application of ORA to Mediterranean contexts, as significant lipid residues have been successfully extracted from pottery recovered from other sites (Debono Spiteri 2012). Increasing the number of vessels tested would, in this case, produce a more representative analysis.

One of the original aims of the study was to observe variation, if any, in pottery use over time (hence the selection of sherds dating from the Early Neolithic (GhD) to the beginning of the Temple Period (Żb)), as well as changes in vessel use with respect to fabric, vessel shape and decoration. Trump (1966) provides a detailed description of the ceramics uncovered at Skorba, which could have been used for a variety of purposes, including cooking, storage and serving. However, the low lipid yields extracted preclude further discussion, as a secure identification of vessel content could not be made in all but one vessel. Low lipid yields add complexity in interpreting the function of Impressed Wares from Skorba since several potential explanations can be put forward to explain the low quantities of lipid present. These include the use of vessels as storage containers for non-fatty products and/or processing of plant material. Simulation experiments have shown that low levels of plant oils become absorbed within the ceramic matrix during vessel use, which is not conducive to survival over archaeological timescales, and is therefore likely to yield negligible lipid quantities (Evershed *et al.* 1995). It is not surprising that plants should be found to play an important role in Early Neolithic cuisine. Their use as a key dietary component is widespread and pre-dates both farming and the production of pottery vessels, which are not essential when processing plant material (e.g. the use of domestic plants is well documented during the Pre-Pottery Neolithic A phase (c. 9000-8500 BC) in the Levant). Remains of barley, wheat

Lab Code	Fabric	Vessel Part	Shape	Decoration	Period	Phase	Date (Cal. BC)	Quantification ($\mu\text{g g}^{-1}$)
SKR-01I	Coarse	Rim	Open vessel	Undecorated	TP	Žb	4350-3050	0.43
SKR-02I	Coarse	Rim	Jar (?)	Undecorated	TP	Žb	4350-3050	0.13
SKR-03E	Coarse	Base	Small bowl	Undecorated	TP	Žb	4350-3050	0.80
SKR-03I	Coarse	Base	Small bowl	Undecorated	TP	Žb	4350-3050	0.48
SKR-04I	Fine	Body	Bowl (?)	Burnished	TP	Žb	4350-3050	0.30
SKR-05F	Fine	Rim	Jar	Burnished	TP	Žb	4350-3050	0.74
SKR-05I	Fine	Rim	Jar	Burnished	TP	Žb	4350-3050	1.27
SKR-06E	Fine	Body	Large vessel with a rounded body	Red slip	EN	RSk	4350-3650	1.73
SKR-06I	Fine	Body	Large vessel with a rounded body	Red slip	EN	RSk	4350-3650	2.36
SKR-07I	Fine	Body	Large vessel with a rounded body	Burnished; red slip	EN	RSk	4350-3650	0.13
SKR-08I	Fine	Rim	Open vessel	Burnished; red slip	EN	RSk	4350-3650	0.10
SKR-09I	Coarse	Body	Large vessel	Red slip	EN	RSk	4350-3650	0.04
SKR-10I	Fine	Body	Large vessel with a rounded body	Undecorated	EN	GSk	5500-4100	1.54
SKR-11I	Fine	Rim	Large vessel	Burnished	EN	GSk	5500-4100	0.21
SKR-12E	Fine	Base	Large open vessel (?)	Burnished	EN	GSk	5500-4100	1.68
SKR-12I	Fine	Base	Large open vessel (?)	Burnished	EN	GSk	5500-4100	0.50
SKR-13I	Fine	Body	Small bowl (?)	Burnished	EN	GhD	5500-4100	1.36
SKR-14E	Medium	Body	Large deep vessel	Undecorated	EN	GhD	5500-4100	3.12
SKR-14I	Medium	Body	Large deep vessel	Undecorated	EN	GhD	5500-4100	4.40
SKR-15I	Medium	Body	Large vessel	Undecorated	EN	GhD	5500-4100	0.56
SKR-16E	Coarse	Body	Bowl (?)	Undecorated	EN	GhD	5500-4100	0.23
SKR-16I	Coarse	Body	Bowl (?)	Undecorated	EN	GhD	5500-4100	5.44

Table 1. Table listing the details of the samples analysed [I: Internal; E: External; TP: Temple Period; EN: Early Neolithic; Žb: Żebbuġ Phase; RSk: Red Skorba Phase; GSk: Grey Skorba Phase; GhD: Għar Dalam Phase].

and lentils were collected from Skorba (Trump 1966, Appendix IV), although low quantities were recorded, which could have been due to floatation methods not having been used in Trump's case. If Impressed Wares at Skorba were being used to process plant remains, the lipid profiles and low lipid yields obtained could be attributed to plant use.

Faunal remains at Skorba show evidence for domestic animals, primarily ovicaprids, but remains of pigs and cows were also retrieved (Trump 1966, Appendix III; Borg 2008). Of interest, Borg (2008) noted the absence of wild species (e.g. deer), despite their earlier attestations in the archaeological record. He suggests that the number of wild animals present in Malta during the Neolithic could have seriously declined, or they could possibly have already become extinct. Hence, the faunal record complements a domestic ruminant fat interpretation to the residue

extracted from vessel SKR-16I, in particular since the $\Delta^{13}\text{C}$ measurement for this sample plots within an area of overlap between ruminant dairy residues and wild ruminant (deer) adipose, more recently investigated by Craig *et al.* (2012) (Fig. 3). However, since the $\Delta^{13}\text{C}$ signal borders on both the ruminant adipose and ruminant dairy fat categories, it cannot be unequivocally interpreted as either, and further analyses are needed to securely attest to the presence of milk. A dairy result would be of significant importance within the Mediterranean framework as it would corroborate evidence from other studies which demonstrate that dairy products were consumed from the initial phases of the Neolithic (Vigne and Hemler 2007; Evershed *et al.* 2008), rather than later (Sherratt 1983). Although the allele responsible for lactose tolerance, 13.910*T, was not yet widespread during the European Neolithic to support a diet rich

in dairy products, small quantities of milk can still be consumed by lactose intolerant people without ill-effects, while removing lactose from milk by processing into cheese or yoghurt, makes dairy products more widely available (Ingram *et al.* 2009). Dairy products may indeed have played a crucial role in the survival of early seafaring farming communities spreading throughout the western Mediterranean, in particular, since surplus dairy products can be processed and stored, hence made available all year round (Rowley-Conwy 2011).

Although not representative of the pottery assemblage analysed, the absence of marine biomarkers in sample SKR-16, which could not securely confirm a potential marine input obtained through isotopic analysis, is consistent with the apparent dietary shift from a predominantly marine to a terrestrial diet during the Mesolithic-Neolithic transition in Europe and the Mediterranean (Richards *et al.* 2001, 2003; Le Bras-Gaude and Clautre 2009; Lightfoot *et al.* 2011). It is difficult to perceive why people would turn their backs on a freely available resource, especially when considering that the site is located within walking distance of the Mediterranean coast. Although pots are not necessary to cook fish, the absence of fish bones provides no indication that perhaps different methods had been used to prepare marine products. This is suggestive of a conscious decision to avoid marine food products, in favour of terrestrial produce.

Conclusion

The application of ORA to Early Neolithic vessels from Skorba is the first of its kind to be carried out on pottery recovered from Maltese archaeological contexts. Unfortunately, the lipid content of the vessels analysed was generally low, with only one sample providing sufficient lipid residue for a secure characterisation. This emphasises the necessity to increase the sample size analysed when applying ORA, and in no way does it diminish the potential of this technique to inform on the use of ancient pots, and culinary preferences of the communities that produced them. The combined biomarker and isotopic approach applied identified a potential admixture of a ruminant fat and a marine oil in one vessel dated to the earliest Neolithic phase on the islands (GħD). Although low lipid yields precluded an in depth

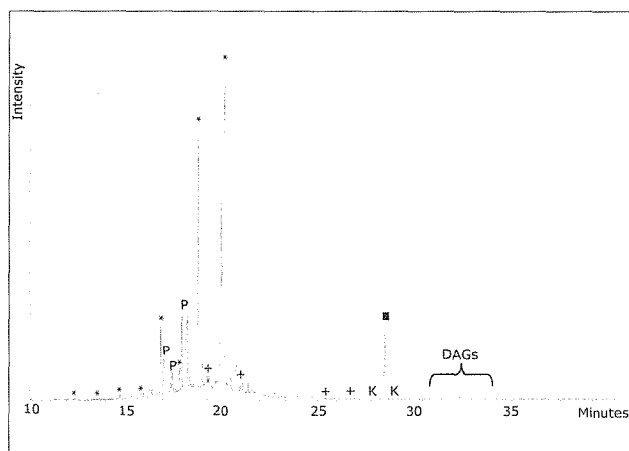


Figure 2. Total Ion Chromatogram of sample SKR-16I. [*: Fatty acids (C_{10:0}-C_{18:0}); +: Alkanes; K: Ketones; DAGs: Diacylglycerols; P: Phthalates; ●: Internal standard (C₃₄ n-alkane)].

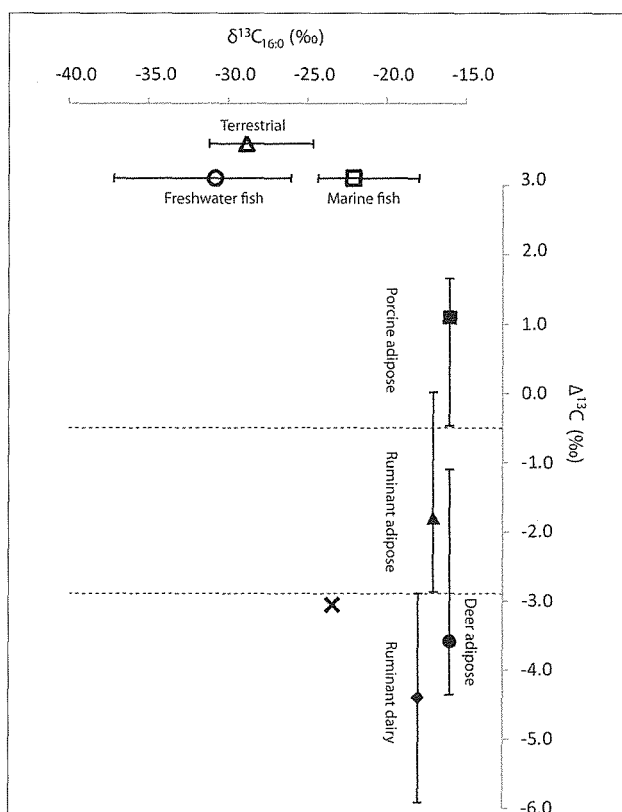


Figure 3. Plot of $\delta^{13}\text{C}_{16:0}$ against $\Delta^{13}\text{C}$ ($\delta^{13}\text{C}_{16:0} - \delta^{13}\text{C}_{18:0}$). Reference points plot the median values obtained from authentic modern animal fats in published literature (Dudd 1999; Craig *et al.* 2005, 2012; Gregg *et al.* 2009) and have been supplemented with data from blood samples of pigs ($n=2$), milk and blood samples of sheep ($n=2$), goats ($n=2$) and cows ($n=2$), all raised on C₃ Mediterranean grown plants, and fish tissue ($n=6$) caught from Mediterranean waters. All modern values have been corrected for post-industrial carbon (1.2‰; Friedl *et al.* 1986). The error bars denote the range at 95% confidence intervals.

discussion on culinary preferences, further testing may yet produce important results, in particular with regard to the potential presence of an agro-pastoral community at Skorba dating to the initial phases of the Neolithic, which would feed into current research on the origin and spread of dairying.

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Cynthianne Debono Spiteri
Philosophische Fakultät
Institut für Ur- und Frühgeschichte und
Archäologie des Mittelalters
Eberhard Karls Universität Tübingen
Tübingen, GERMANY
cynthianne.debono-spiteri@uni-tuebingen.de

Oliver Craig
Department of Archaeology,
BioArCh, University of York,
York, YO10 5DD
UNITED KINGDOM
oliver.craig@york.ac.uk

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- Cynthianne DEBONO SPITERI** obtained a B.A. (Hons) in Archaeology (Malta), followed by an M.Sc. in Scientific Methods in Archaeology (Bradford), and a Ph.D. in biomolecular archaeology (York). She carried out her Post Doctoral Research in the Plant Foods in Hominin Dietary Ecology Research Group at the Max Planck Institute for Evolutionary Anthropology in Leipzig, and is currently employed as a Junior Professor for Archaeometry at the University of Tübingen, Germany.
- Oliver CRAIG** obtained his first degree in Biochemistry and Genetics (Nottingham), an M.Sc. in Osteology, Palaeopathology and Funerary Archaeology (Sheffield), followed by a Ph.D. with the Ancient Biomolecules group at Newcastle, UK. He has completed a Marie Curie Fellowship at the University of Rome II, 'Tor Vergata', and currently directs the BioArCh facility at the University of York.

Archaeometric identification of Maltese imports in prehistoric Sicily: Żebbuġ phase pottery from Licata-Caduta (Agrigento)

Germana Barone, Domenica Gullì, Paolo Mazzoleni,
Simona Raneri, Davide Tanasi

During the study of a pottery assemblage collected at the Sicilian site of Licata-Caduta (Agrigento), continuously occupied between the Neolithic and Early Bronze Age, some ceramics presented typologies, fabrics and surface treatments alien to Sicilian repertoires and closer to Maltese productions. Sampled for petrographic (OM) and chemical (XRF) analyses one artefact turned out to be produced in Malta and imported into Sicily. The search for its chronological and cultural placement has led to the discovery of the first certified Żebbuġ phase import in Sicily.

Introduction

In the context of the interconnections between Mediterranean prehistoric civilizations, the Sicily-Malta interaction has been a leitmotif deriving from the geographic proximity of the two insular contexts and by a substantial cultural homogeneity over the centuries. The evidence on which the academic debate is centered is often represented by Maltese ceramics found in Sicily and vice versa, apparently pointing to a 'mobility of goods' rather than a 'mobility of humans' as the principal phenomenon of this interaction (Tanasi 2014a). The absence of archaeometric

characterizations of pottery and the impossibility of distinguishing imports from local imitations, keeps misleading scholars, conditioning the outlook on this issue (Biehl and Rassamakin 2008).

While significant advances have recently been made for the Middle Bronze Age, (Barone *et al.* forthcoming), for the previous periods such as the Neolithic and Copper Ages, when Sicilian and Maltese cultures had substantial elements in common (Trump 2004, 231-42), the gist of the interconnection has never been clarified. New data can now be offered through evidence from a previously unknown site in western Sicily.

The coastal site of Caduta is located 5 km west of the town of Licata (Agrigento), at an altitude of 40 m above sea level (Amato 2012, 327) (Fig. 1). In the 1970s a local archaeological association carried out a ground survey on a terrace, partly damaged by excavations of a modern quarry. The cultural material gathered pointed to a long-term occupation ranging between the Neolithic and Greek Archaic periods. The importance of the site during prehistory, confirmed by the large quantity of lithic implements and heterogeneous pottery related to the Neolithic, Copper and Early Bronze Ages, is also underlined by the presence of two nearby necropoleis. One of these, with shaft graves, has been almost totally obliterated by the quarry



Figure 1. Aerial map of southern coast of Sicily with indication of the site of Licata-Caduta. (source Google maps).

whereas the other necropolis characterised by chamber tombs has unfortunately been completely looted (Gullì 2012, 217-18).

Thanks to a permit granted by the cultural heritage Superintendence of Agrigento, in summer 2012 the reappraisal of the prehistoric artefacts from Caduta kept at the archaeological museum of Licata was started.

Materials and methods

At first glance, the pottery presented fabric and typological features which were not immediately classifiable and were rather uncommon for the standard Sicilian repertoires. Particularly puzzling were two pieces, the portion of an ovoid jar (L101) (Fig. 2) and a handled cup (L1) (Figs 3-4), which shared the same autoptically recognizable fabric and showed the same surface treatment, but which lacked

the volcanic grits quite ubiquitous in all the other sherds.

L101

H[height]. 16.5; w[idth]. 18.8; handle \varnothing [diameter] 1.7; th[ickness]. 1.1 cm

Body portion of an ovoid jar, comprising three pieces, with a massive and wide vertical loop saddled handle; cut-out decoration: vertical groove passing through the handle in correspondence with the saddle, horizontal series of very rough oval and triangular nicks in line with the upper attachment of the handle. Thick burnished slip on the outer surface ranging from yellowish brown to purplish colour. The handle, applied subsequently but before firing, was attached matching its final pegs with corresponding globular embossed sockets on the wall. On piece A, the handle was misplaced and one of the sockets is



Figure 2. Jar L101 from Licata-Caduta. (Photograph authors). Scale bar 5 cm.



Figure 3. Handled cup L1 from Licata-Caduta. (Photograph authors). Scale bar 5 cm.

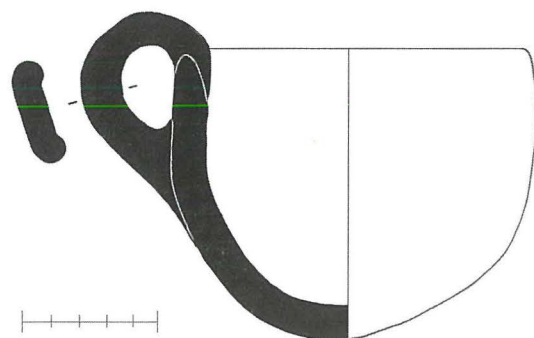


Figure 4. Handled cup L1 from Licata-Caduta. (Drawing by Carlo Veca). Scale bar 5 cm.

still visible; on piece B, the handle being missing, the socket is clearly distinguishable.

Medium-coarse fabric, over-fired with abundance of chamotte.

L1

H. 10; mouth \varnothing 12.5; handle th. 1.4; wall th. 0.9 cm

Handled cup with hemispheric body, round base, straight thinned rim and vertical surmounting round handle. Thick burnished slip inside and out surface ranging from yellowish brown to red. Intact, restored with a gap on a side of the body.

Medium-coarse fabric with abundance of chamotte.

Since the objects came from an uncertain context, the only way to establish the chronology and to interpret them has been by searching for comparisons. But while the handled cup L1 presented a rather common shape, ubiquitous in many prehistoric Sicilian *facies*, piece L101, sharing the same uncommon fabric of L1, appeared to be a novelty.

Methodology

As all the prehistoric ceramics collected at Caduta presented unexpected features, it was decided to sample 22 specimens for archaeometric analyses, representing autoptically recognizable main fabrics, including specimen L101 but not L1. This approach aimed to reverse the traditional research pipeline based first on the typological definition and classification through comparisons and then eventually on the archaeometric characterization of the fabrics and provenance definition. This approach is in accordance

with the new trend in pottery studies in which a more prominent position is given to chemical and petrographic analyses in order to compensate for the limits of a study based on simple direct observation (Maniatis 2009).

Detailed petrographic (OM) and chemical (XRF) analyses were carried out on sample L101 in order to characterize fabric and mineralogical features and chemical composition respectively. A petrographic description on thin sections was made following the scheme proposed by Whitbread (Whitbread 1995), which facilitates a detailed characterization of pottery in terms of texture, groundmass and inclusions. Chemical analyses of major and trace elements were performed by X-ray fluorescence (XRF) spectrometry (PHILIPS PW 2404/00) on powder-pressed pellets; total loss on ignition (LOI) was gravimetrically estimated after overnight heating at 950°C.

Results

The sample L101 is characterized by medium-coarse grain size and abundant fossil groundmass. In detail (Fig. 5), the microstructure shows channels and planar voids with remains of carbonaceous material suggesting the use of straw as temper. Less abundant are vugs and slightly preferential oriented vesicles. The fossil-rich groundmass is heterogeneous and is characterized by low optical activity and brownish-black colour. The inclusions have an open space distribution and a bimodal grain size: the coarser inclusions are represented by chamotte with prevalently sub-angular shape and millimetric dimensions, while the finer ones are mainly quartz grains. Overall, the sample shows a fabric characterized by fossil-rich groundmass and chamotte inclusions. Furthermore,

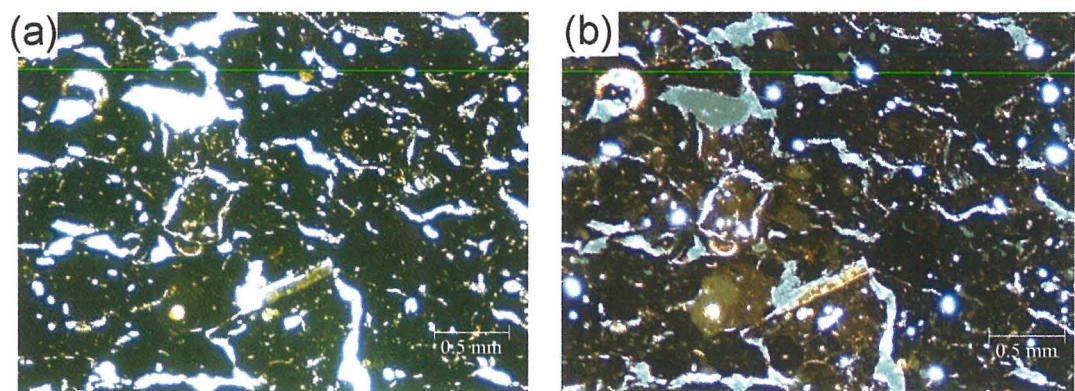


Figure 5. Microphotographs of sample L101 in parallel (a) and crossed (b) nicols.

Samples	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MnO	MgO	CaO	Na ₂ O	K ₂ O	P ₂ O ₅	Sr	V	Cr	Co	Ni	Zn	Rb	Y	Zr	Nb	Ba	La	Ce
L101	54.97	0.82	14.18	5.40	0.09	2.52	10.34	0.78	3.36	0.15	856	103	70	2	37	68	39	6	49	14	1724	38	46
Maltese potteries	50.80	0.86	15.08	4.69	0.03	2.45	22.17	0.78	2.70	0.43	334	100	105	5	51	82	54	14	89	3	241	38	73
Maltese clays	36.77	0.54	11.84	2.76	0.01	3.36	41.60	0.72	2.07	0.37	735	73	72	5	37	69	56	16	94	9	92	33	42
Licata clays	57.5	0.71	13.88	4.77	0.06	2.53	17.2	1.04	2.1	0.19	520	95	78	9	34	63	72	23	173	13	230	31	64

Table 1. Chemical composition of the sample L101 and reference data (average chemical data on 66 samples of Licata clays, 27 samples of Maltese pottery and two samples of Maltese clays). Concentration of major and trace elements are reported in wt% and ppm respectively.

information about micromass optical activity allows the estimation of a medium-high firing temperature (about 800° C).

In an attempt to identify the provenance of L101 sample, XRF chemical analysis was also carried out. The obtained data were compared with unpublished raw data about a selection of 66 clays collected in the territory of Licata (*pers. comm.* G. Barone and P. Mazzoleni), with 27 Maltese Middle Bronze Age ceramic samples coming from the settlement of Borġ in-Nadur and two samples of Maltese clay of Blue Clay Formation type from Ġnejna Bay (Barone *et al.* forthcoming).

Based on the average chemical data deriving from these three groups and comparing them with those resulting from sample L101, the following comparative table was obtained (Table 1).

In particular, chemical data obtained by XRF measurements were processed by a well-known statistical method, previously successfully applied on pottery (Aitchison *et al.*, 2002; Buxeda i Garrigós, 1999; Barone *et al.*, 2005; Barone *et al.*, 2011; Barone *et al.*, 2012), based on a statistical approach introduced by Aitchison (Aitchison 1986). The following biplot (Fig. 6) represents the studied samples plotted in the first two principal components plan. It is noteworthy that sample L101 is plotted with Maltese Middle Bronze Age pottery and Maltese clays and not with the Licata clays.

A previous multivariate discriminant analysis performed on chemical data of trace elements of numerous groups of Sicilian

and Maltese pottery specimens has demonstrated that, at least in the Middle Bronze Age, the pottery production of Sicily and Malta can be clearly distinguished and separated on geochemical basis (Barone *et al.* forthcoming). For this reason, the discriminant function (D.F.) has been calculated and compared with the values obtained for Sicilian and Maltese pottery production respectively. The obtained result (D.F.=0.21) suggests a Maltese provenance for the sample L101. Furthermore, petrographic analysis, providing a detailed characterization of texture, structure and composition of sample L101, pointed to features similar to Maltese Middle Bronze Age samples from Borġ in-Nadur (Barone *et al.* forthcoming).

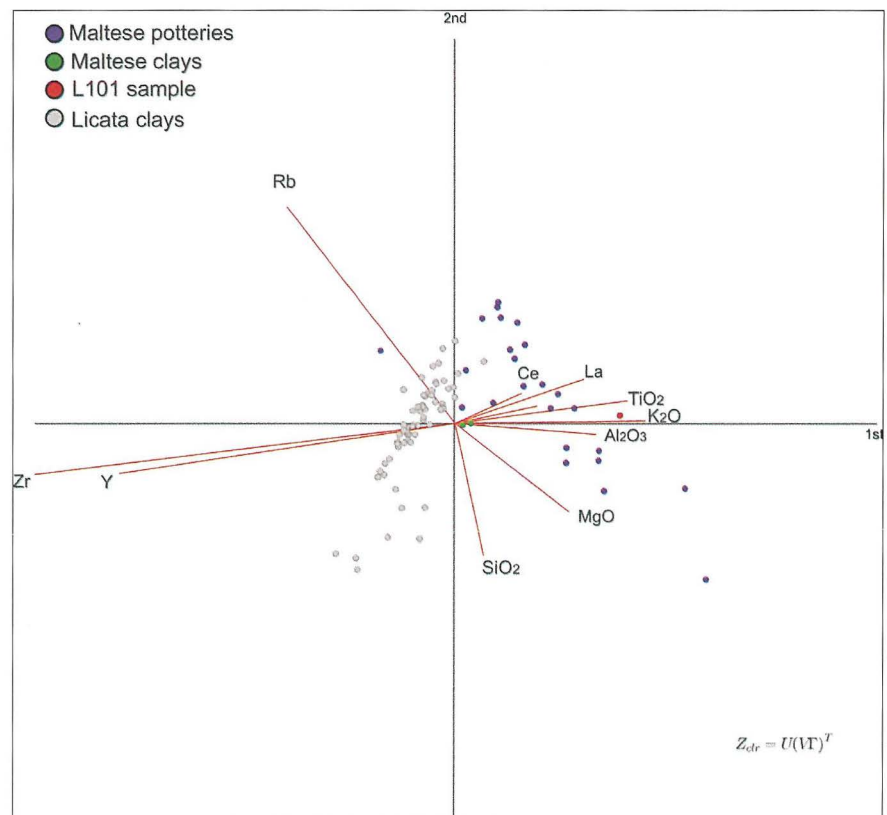


Figure 6. Biplot of the two principal components.

Finally, comparing the petrographic and chemical data resulting from L101 with those deriving from the other 21 samples from Licata-Caduta, L101 appears as unique and not at all comparable with them, reinforcing the assumption that it is the only Maltese import in the group of specimens sampled.

The definition on an archaeometric basis of the Maltese provenance of the ovoid jar L101 opened up a new research perspective, explaining the reason for the apparent lack of comparisons in Sicily. Although the handled cup L1 has not been analyzed, because the sample taken turned out to be insufficient, the identical surface treatment, with the same thick slip ranging from yellowish brown to red and purple, could indicate a certain connection between the two vessels, if not the same provenance.

Due to the extreme conservatism of Maltese prehistoric pottery production in terms of technology and manufacture (Barone *et al.* forthcoming; Tanasi forthcoming), the chemical and petrographic identity of L101 with the Borg in-Nadur pottery sampled from Borg in-Nadur cannot be considered as a chronological clue. Furthermore, the shape, typology and surface treatment of L101 are alien to the Borg in-Nadur repertoire.

As a result of the familiarity of one of the present authors with Maltese prehistory (Tanasi and Vella 2011; Tanasi and Vella forthcoming), and through a scrutiny of the literature on Maltese prehistoric pottery between the Neolithic and Early Bronze Ages, it became clear that the most significant analogies come from the Żebbuġ phase (4100-3700 BC).

This phase marks the end of the Neolithic and the beginning of the early Temple Period. The pottery is handmade using a soft fabric, fired at a relatively low temperature and showing smoothed surfaces and fairly light colours (Trump 1966, 31). Two main fabrics have been distinguished, a yellowish fine ware with thin walls, pale and well fired, usually yellow in colour, and a higher quality, harder well-burnished pale or milky grey ware (Malone *et al.* 2009, 195). With regards to decoration, both painting and incision occur. In particular the incised decoration with its intricate linear and geometric patterns, even symbolically used for representing anthropomorphic figures, can be considered the most distinctive trait of this class. The main issue of Żebbuġ phase pottery is the absence of a rigidly standardized repertoire, the formal guide types of which are represented in the classification of Evans (1953, 50). That repertoire, which was mainly characterized by several varieties of two main shapes, the jar and the handled cup, has recently been supplemented by data from the excavation at Brochtorff Circle, where scholars distinguished between 'storeyed' and 'devolved' shapes associated with an earlier and later date (Malone *et al.* 1995; 2009, 194-200).

According to Evans, some characteristic shapes appear foreign to the local ceramic repertoire, showing clear parallels with ceramic traditions documented in the central Mediterranean and Sicily (Evans 1953, 49-50, 78). In Sicily, the pottery class showing overall features similar to Żebbuġ pottery is San Cono – Piano Notaro (Bonanno 2008, 30), traditionally the first phase of the local Copper Age, recently dated using

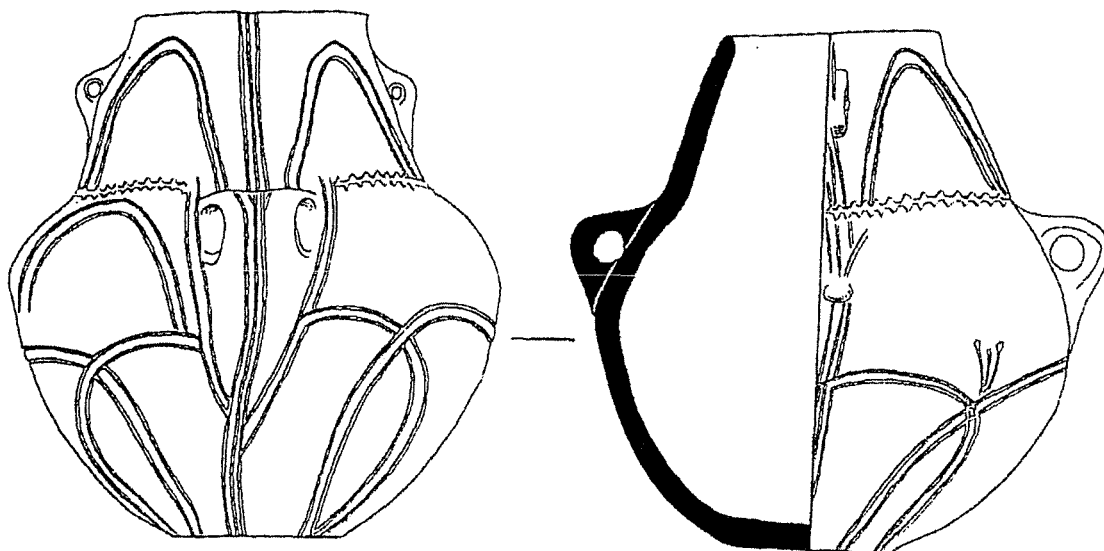


Figure 7. Jar of the Żebbuġ phase from the National Museum of Archaeology of Valletta (Trump 1971).

the radiocarbon technique to the transition between 5th and 4th millennium BC (Gulli and Terrasi 2013). The profile of the ovoid jar L101 directly recalls the main shape of the Żebbuġ phase pottery repertoire, the so-called deep jar, classified by Evans as shape 17 (1953, 49-50, fig. 7). Since the example from Caduta is fragmentary, it is not possible to ascertain whether it belongs to the storeyed or devolved group. A particularly striking comparison is represented by the jar U/P.21, from an unknown Maltese site, located at the National Museum of Archaeology, Malta (Evans 1971, 206, fig. 29.10) (Fig. 7). This example displays the same type of massive strap handle marked by a deep saddle intercepted in this case by a row of three incised vertical lines. It also shows a double horizontal series of triangular nicks, more neat and regular, in line with the upper attachment of the handle.

Besides this typological comparison, the jar from Caduta does not show any sign of the complex incised patterns so typical of the Żebbuġ phase pottery and it does not have the typical surface colour, that is generally more yellowish and brownish than reddish. Furthermore, the Żebbuġ pottery has thinner walls and more refined and smoothed surfaces.

However, during the excavations carried out at Skorba, Trump identified a further class of Żebbuġ phase pottery that he named *Pellegrin ware*, from the name of the site of Qala il-Pellegrin (overlooking Ġnejna Bay) where it was identified for the first time (Trump 1966, 36). He described it as a coarse, over-fired, bright red ware occasionally of purplish colour, never decorated and mainly represented, in terms of shapes, by the ovoid or slightly S-profile jar. About its date, Trump hypothesized that *Pellegrin ware* appeared in a final stage of the Żebbuġ phase and that it continued in the course of the subsequent Mġarr and Ġgantija phases.

Within this framework, the jar from Caduta seems to show precisely the same features as this ware, with special reference to its first stage of development related to a late Żebbuġ phase. This assumption is further reinforced by the evidence of the handled cup L1, having exactly the same autoptically recognizable fabric and surface treatment as the jar L101. In fact, it directly recalls the typology and profile of a devolved handled cup from Brochtorff Circle (Fig. 8), dated by the excavators to the very end of the Żebbuġ phase. Both have in common a peculiarly shaped strap handle with curved rounded side edges.

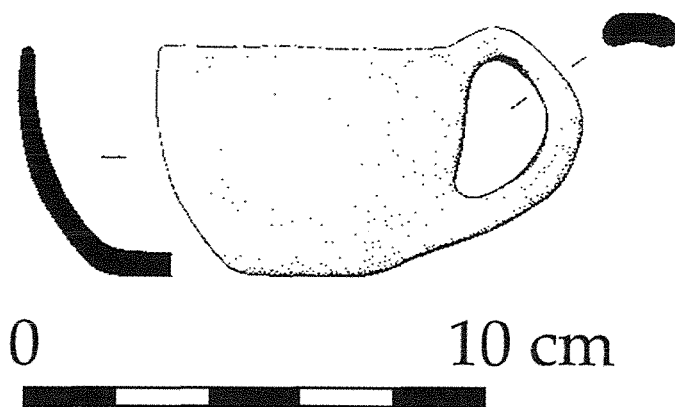


Figure 8. Handled cup of the Żebbuġ phase from the Brochtorff Circle (Malone *et al.* 2009).

Although archaeometric data are not available for cup L1, the similarity with sample L101 may suggest the same Maltese provenance, however further investigation is required to confirm whether this is the case.

Discussion

The identification for the first time of Żebbuġ phase pottery imports in Sicily represents a significant advance in research about cultural connections between Sicily and Malta in the earlier phases of prehistory. Besides the well-known contiguity between the Sicilian and Maltese Neolithic and Copper Age pottery styles, such as Stentinello/Għar Dalam, Diana/Red Skorba, Żebbuġ/San Cono-Piano Notaro, the other trait that characterizes the connection has been the transfer of raw materials from Sicily to Malta, such as obsidian, flint, basalt, alabaster, sulphur and possibly ochre (Tanasi and Vella 2014b). Without the proper support of archaeometry, it is more problematic to take into consideration the many Sicilian pottery imports reported in Malta, such as the three sherds of the Middle Neolithic style of Trefontane-Palikè from Skorba and Santa Verna (Trump 1966, 45), the examples of Diana and Serra D'Alto from Skorba (Trump 2002, 39; 2004, 246), the Piano Quartara, Serrafelicchio and S. Ippolito pieces from the Brochtorff Circle (Trump 2002, 212; Malone *et al.* 2009), and the sherds of Malpasso-S. Ippolito style from Għar Mir dum (Tanasi 2014b).

In any case, the evidence of Licata-Caduta has now provided reverse feedback, represented by the jar

L101. Even more significant is the fact that the vessel is a container, possibly introduced into Sicily for its content or used as customary storage by Maltese immigrants who may have taken it with them to Sicily.

Obviously 'one swallow does not make a summer', but it certainly helps us to understand how complicated the cultural interweaving must have been, how risky it is to rely on absolute assumptions of the sort 'Sicily just exported and Malta just imported', and in particular it serves to emphasize the growing relevance of archaeometry in the study of pottery.

Conclusion

In conclusion, the new data coming from Licata-Caduta encourages the search for a proper archaeological exploration of this site and the completion of the overall study of all the prehistoric ceramics already gathered there, with the greatest possible enlargement of the sampling for petrographic and chemical analyses. Finally, it is worth recalling that Licata-Caduta is located on the same coast and less than 30 kilometers east of Cannatello (Agrigento), the only other site of central western Sicily in which Maltese pottery imports, confirmed by archaeometric tests, were reported (Barone *et al.* 2014). Although the materials from Cannatello date to the Middle-Late Bronze Age and not to the Copper Age, this could be an indication that the stretch of the Sicilian southern coast between Cannatello and Licata remained for centuries the only 'western hub' for the arrival of Maltese goods and perhaps people in Sicily, probably aided by favourable prevailing winds (Tanasi & Vella 2014, fig. 1)

Germana Barone, Paolo Mazzoleni, Simona Raneri
Dipartimento di Scienze Biologiche, Geologiche e Ambientali
Università di Catania, Corso Italia 57, 95125,
Catania, Italy
gbarone@unict.it, pmazzol@unict.it, sraneri@unict.it

Domenica Gulli
Soprintendenza BB.CC.AA. di Agrigento
Via Imera 50, 92100 Agrigento, Italy
domenica.gulli@regionie.sicilia.it

Davide Tanasi

Arcadia University - The College of Global Studies
Arcadia Sicily Center, via Roma 124, 96100
Siracusa, Italy
tanasid@arcadia.edu



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- Germana BARONE** is Associate Professor at the Department of Biological, Geological and Environmental Sciences of the University of Catania and responsible for the courses of mineral geo-resources and mineralogical and petrographic applications for the environment and cultural heritage. Her research interests are focused on the archaeometric characterization of cultural heritage materials. The main topics of her publications include innovative destructive and non-destructive analytical methods for the mineralogical and geochemical study of rocks and artificial stone materials. She has authored 54 ISI papers in national and international scientific journals.
- Domenica GULLÌ** is archaeological officer with the Superintendence of Cultural and Archaeological Heritage of Agrigento and she is a specialist of prehistory and proto-history. Her research interests include several facets of Sicilian prehistory, in particular the Neolithic and the Copper Age. She has authored numerous scientific papers in national and international peer reviewed journals and the monograph *La Necropoli di Anguilla di Ribera* (Regione Sicilia, 2008).
- Paolo MAZZOLENI** is Associate Professor at the Department of Biological, Geological and Environmental Sciences of the University of Catania, where he has lectured in petrography and applied petrography. He teaches on numerous training and specialization courses in the context of geo-mineralogical disciplines applied to environmental studies and cultural heritage. He currently conducts research on the use of innovative methodologies in mineralogy and microstructure of stone and pottery analysis, also in collaboration with both Italian and foreign researchers. He has authored 58 ISI publications in national and international scientific journals.
- Simona RANERI**, Conservation Scientist for Cultural Heritage and Geologist, is a doctoral candidate in the Department of Biological, Geological and Environmental Sciences at the University of Catania, where she works on a research project devoted to the modelling of the inner structure of natural building stone by applying fractal geometry to test nanostructured products for use in conservation. In addition to her main research activity, she also works on archaeometric characterisation of artificial stone materials through innovative non-invasive and non-destructive methodologies. She has delivered papers in several international conferences and published papers in national and international journals.
- Davide TANASI** holds a Ph.D. in Archaeology and is Professor of Archaeology at Arcadia University, The College of Global Studies, Sicily Center. His research interests include Mediterranean prehistory, island archaeology, archaeometry of ancient ceramics, computer graphics in archaeology, and digital communication of cultural heritage. He has authored more than a hundred scientific papers in these fields and produced 3D documentaries about Sicilian archaeology and cultural heritage. His publications include *La Sicilia e l'arcipelago maltese nell'età del Bronzo Medio* (Officina di Studi Medievali, 2008) and *Site, artefacts and landscape. Prehistoric Borġ in-Nadur, Malta* (Polimetrica, 2011, co-edited with N. C. Vella). He has been the director of the Field School in Archaeology of Arcadia University in Sicily since 2012.

Ġgantija and the surrounding lands: insights through a late eighteenth-century contract

Anton Bugeja

The deed through which Giovanni Battista Cassar Desain protected Ġgantija is described and possible reasons behind his decision discussed. A plan accompanying the contract has been utilised to throw light on Ġgantija and the surrounding late eighteenth-century landscape. Relevant contemporary representations are analysed to throw light on the state of Ġgantija before the clearances of the 1820s. Caves, an underground spring, and a forgotten path have been rediscovered, highlighting the fact that the area remains largely unexplored.

The measures taken by the Maltese nobleman Giovanni Battista Cassar Desain to protect Ġgantija in the late eighteenth century remain remarkable and outstanding. His act, however, would have probably passed unnoticed were it not for the account given by the fifth prince of Biscari, Ignazio Paternò (1781, 117). Having been involved in the late 1770s in a project aimed at conserving the antiquities of eastern Sicily (Paternò 1781, 4-5; Taylor 2013, 164), the prince immediately recognised the importance of Cassar Desain's deed and mentioned it in an otherwise laconic description of the antiquities on site. Paternò tells us that in granting the lands containing an ancient building of semi-circular form on perpetual emphyteusis, Cassar Desain protected the ancient ruins by making an express condition that no stone was to be removed under penalty of forfeiture of the contract.

Consequently, reference to Paternò's account was repeatedly reproduced by various scholars. Already in the early nineteenth century, Bres (1816, 137) reproduced the account given by the prince, identifying the remains described with Ġgantija. More recent mention was made by Bonello (1996, 19), Freller (2009, 644), Grima (2004a, 26), and Pessina and Vella (2009, 403). The rediscovery of the original contract came through a short article by D'Anastas

(2005, 13) who made public the existence of archival material listing the property owned by Cassar Desain. The reference to the contract relevant to Ġgantija was found there (NAM, MCC Inventarium Bonorum, 6, f. 213v).

The contract

On 15 February 1776, Paulo Buhagiar from Xaghra, Gozo, was granted lands in the same village on temporary emphyteusis for 101 continuous years from mid-August 1777 for the annual sum of 300 scudi (NAV, Not. P.V. Giammalva R292/24 ff. 697v-702r). The lands, surveyed by Jacobo Bianco, measured five salmi, five tumoli and five mondelli, and contained a number of features. These consisted of a garden with different fruit trees and vines as well as a spring within a hewn subterranean cave. There was also a building accessible through an alley and a small animal pen leading to a cave. Also documented were a residential building within a courtyard, a kitchen, a field with a storehouse, a staircase, and two rooms above each other.

Access to the lands was from the contrada delle Fontane, meaning 'of the fountains', a reference to lands known since medieval times as 'lâl-Għejun (Wettinger

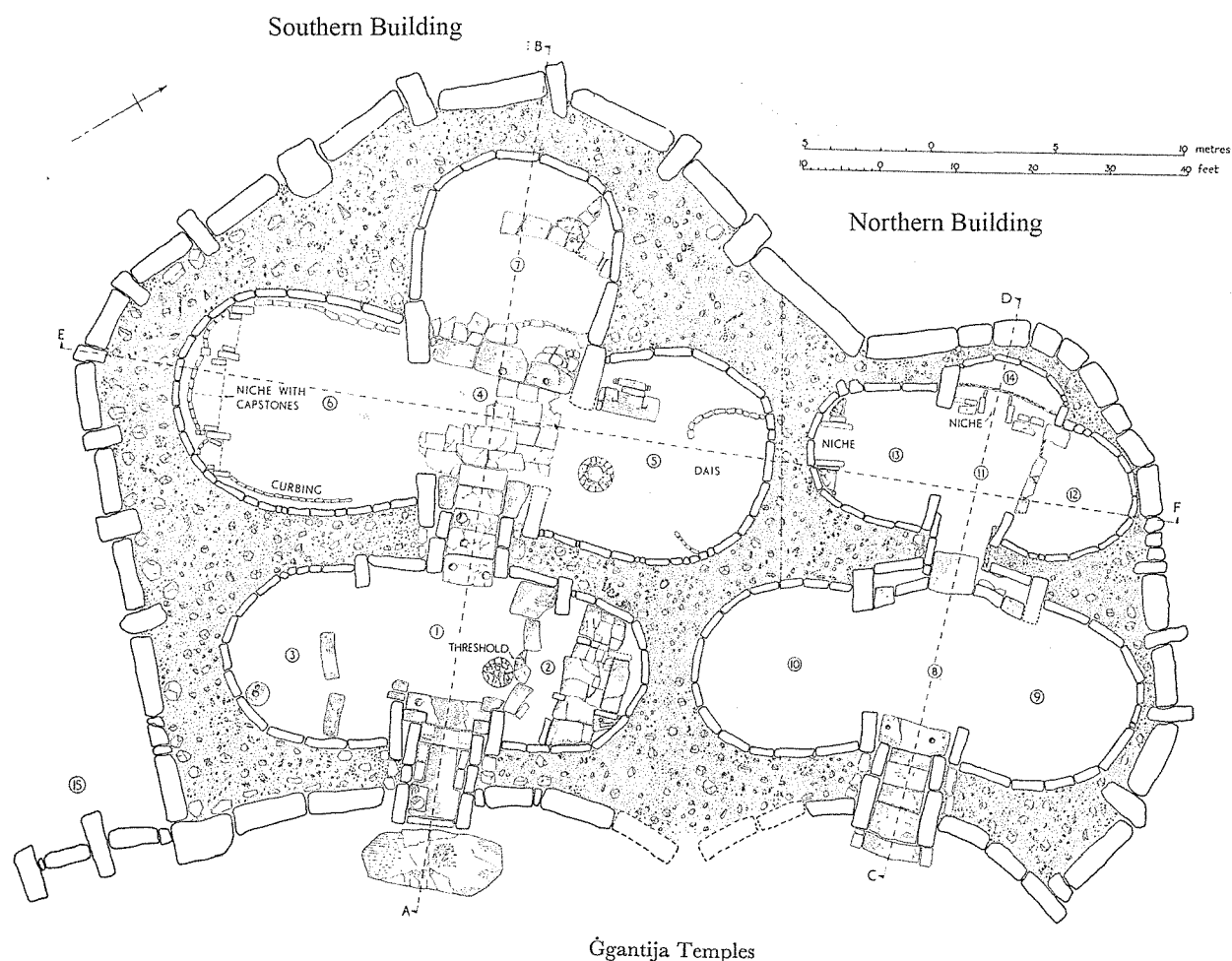


Figure 1. Plan of Ġgantija (after Evans 1971).

2000, 221). Through the deed, Buhagiar was obliged not to remove or take anything from the lands. As was common in contemporary contracts, the ownership and tenancy of the surrounding lands is listed, with a public road and lands of Rev. Michaeli Azzopardi documented to the east. Lands formerly belonging to medical doctor Giovanni Nicolai Gauci, the Fondazione Lascaris and others held by Giovanni Domenico Theuma were to the south, while to the north were lands belonging to Martini Xerri, Caroli Theuma, and others. A public road and lands belonging to the heirs of Federici known as tal-Barun formed the western boundary.

Preserving Ġgantija

More significant is the reference to Ġgantija as a tower known as 'of the giants' (*turri app[el]l[ato] delli*

Giganti). Its preservation was ensured through the following clause:

Di piu', che le pietre grosse, che formano l'antica Torre de[i] Giganti non possa il d[ett]o Censualista, e suoi sotto pena della cadicita di d[ett]o Territorio con tutt' i miglioramenti, che sin' allora si troverano fatti in esso, rompere, ne sconcertare da quel stato in cui si trovano, ne pure quell'altre caso mai vi fossero in qualche muro vicino, e formano parte dell'istesso, e non altri[menti] (f. 700v).

This meant that the new tenant was obliged not to disturb, move or break the large stone blocks forming Ġgantija and was to give the same treatment to the nearby walls in case they contained undiscovered parts of the said structure. If such condition was broken the owner would forfeit rights over the lands.

The contract corrects the account given by Paternò. It is clear that the lands were granted on temporary and not perpetual emphytheusis. Furthermore, the contract specifies that no stone was to be removed from the “Giants’ Tower” before directing that nothing was to be taken away from the lands in general. Probably inspired by the megalithic screen at the southern corner of the façade (feature 15 in Fig. 1) or the megaliths in the terrace wall in front of the temples (shown in Grima 2004a, 44-49) Cassar Desain extended the conditions applying to Ġgantija to the nearby walls, making his decision even more noteworthy. Paternò makes no mention of this.

The reasons why Cassar Desain chose to preserve Ġgantija remain unknown. An inventory of his library does not refer to any books related to the study of antiquities, and the presence of ‘several ancient things’ (*diverse cose antiche*) in one of his properties (NAM, MCC Inventarium Bonorum, 6, ff. 260v-268v, 273v) is not qualified further to support an interest in things archaeological. The interest of scholars such as Agius de Soldanis (Farrugia 1999, 1, 54) and Bartolomeo Mifsud, known as Padre Pelagio, (MCA, Misc. 55, ff. 143r-143v) might have influenced his decision. Indeed, Padre Pelagio gave a description, measured and attempted to draw up a plan of the temples, while Agius de Soldanis included measurements of Ġgantija that are different from those given by other authors. This indicates that both scholars visited and studied the remains. Another scholar, Giovanni Antonio Ciantar (1772, I, 341), does not appear to have made any serious study of the site as he only reproduces the description by Abela (1647, 119). Furthermore, although Ciantar’s *Malta Illustrata* was published just a few years before the signing of the contract, the book was not in Cassar Desain’s library (NAM, MCC Inventarium Bonorum, 6, ff. 260v-268v). Ciantar’s influence on the latter’s decision is unlikely.

Pessina and Vella (2009: 403-404) place Cassar Desain’s awareness of the importance of Ġgantija after von Riedesel’s visit to the temples in 1767, suggesting that the idea to protect Ġgantija came through the attention given to it by European visitors. Documented discussions on antiquities between locals and visitors (Attard Tabone 1999, 173; Paternò 1781: 117-118) support such hypothesis. It is important to note, however, that by being drawn up in February 1776, the contract predates the visits of travellers such

as Ducros, Borch and Colt Hoare as well as Hoüel’s second visit to the Maltese Islands (Freller 2009, 38, 92, 96, and 676). This not only reduces the role these well-known travellers might have had in shaping Cassar Desain’s actions but also reveals that the latter’s decision occurred quite early when seen within the context of the increasing number of visitors arriving in the Maltese Islands in the late 1770s.

But was Cassar Desain preserving Ġgantija with the noble intention of preserving ancient remains? Or was he hoping to dig up treasures like those discovered in Gozo in the previous decades (Farrugia 1999, 1, 57-58, 2, 13-14)? A definite answer cannot be provided, but it is important to note that in the eighteenth century even serious academic researchers collected ancient artefacts for personal purposes. Indeed, Agius De Soldanis, a contemporary scholar, was not ashamed of claiming to have asked for the clearance of over forty tombs to satiate his scholarly curiosity (NLM, Lib. Ms. 143/1 ff. 490r-490v). Similarly, explorations undertaken by Ciantar at the presumed ancient Temple of Hercules were only meant to obtain two specimens of marble for his museum (Ciantar 1772, 387-88, 461-62). Thus, in the absence of more direct information, delving into the real intentions of Cassar Desain would probably lead to the judging of past practices by modern standards. Nonetheless, his decision remains a significant event by a private individual to preserve the antiquarian heritage of the Maltese Islands, predating similar organised action by government by decades. It continued the legacy established by Abela who in his 1637 will took measures to preserve the antiquities and any undiscovered tombs at his Marsa garden (NAV, M. Ralli R412/5, f. 35v; Bonanno 1984, 36).

A plan of Ġgantija and the surrounding lands

The notarial act is accompanied by a plan (hereafter notarial plan) which throws light on the late eighteenth-century landscape around Ġgantija (Fig. 2, top). Many details are also shared by plate 26 in Smyth’s 1829 account on Ġgantija printed around fifty years later (Fig. 4) and will be used alongside the notarial plan to further support the arguments presented here. The area had until recently witnessed little change, undoubtedly following the transfer of Ġgantija and the surrounding lands to government.

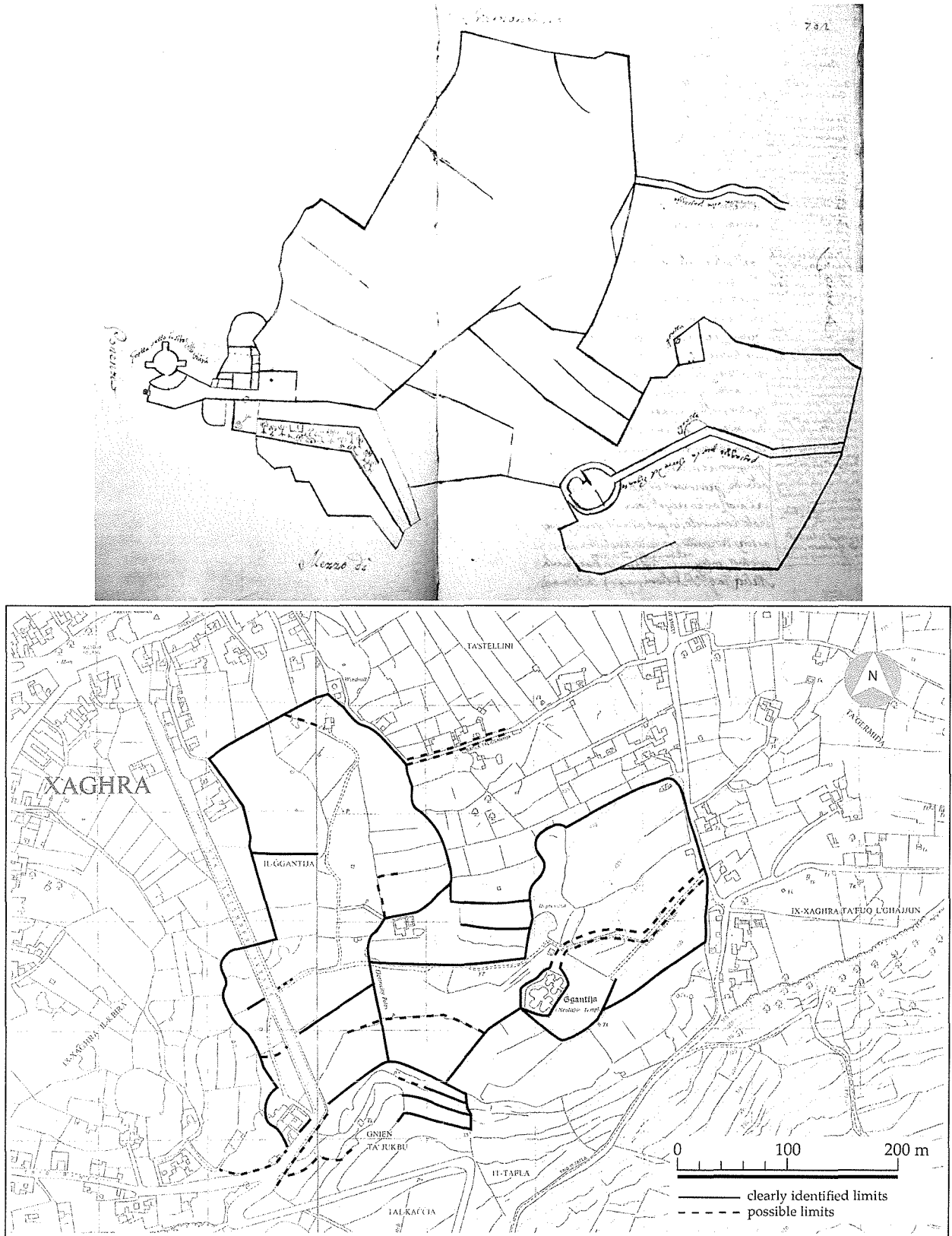


Figure 2. Map of Ġgantija and surrounding lands in 1776 (Notarial Archives, Valletta) (top) and overlay on a 1970s Ordnance Survey Sheet (adapted by Maxine Anastasi).

Ġgantija

In the notarial plan, Ġgantija is shown as a roughly circular building surrounded by a thick wall. This impression was enhanced by the megalithic blocks prominently visible on the exterior of the complex and debris on the inner parts. This was probably behind the name Giants' Tower used at the time and the representation of Ġgantija in a predominantly circular form by Borch (1782, 2, 24). In the notarial plan, the two buildings forming Ġgantija are already visible. The northern building is depicted as a semi-circular space connecting to a passage on one side and to the southern building on the other. In the southern building, a semi-circular space is shown.

The notarial plan is a rare document of the appearance of Ġgantija before it was cleared in the 1820s. Considering that surveyors (*periti agrimensori*) were engaged to prepare plans for eighteenth-century

contracts, one may argue that the plan is a fairly precise representation of Ġgantija. Research elsewhere has however revealed that such plans provide a schematic illustration of the properties surveyed and not a precise plan with accurate measurements (Bugeja, forthcoming). Indeed, I believe that an appropriate interpretation of the notarial plan should only be made by comparison with other contemporary plans, particularly those provided by the travellers Ducros (Strickland 2005, 90) and Hoüel (1787, pl. 251). Also considered is the plan by the Maltese Capuchin scholar Padre Pelagio (MCA, Misc. 55, f. 143v), better known through a modified copy reproduced in Evans (1971, 183) (Attard Tabone 1999, 175-76, fn. 3).

These four plans of Ġgantija (Fig. 3) differ in various details, further supporting the need for a cautious interpretation. A comparison of the plans to modern aerial views of Ġgantija (Grima 2004a, 31 top right

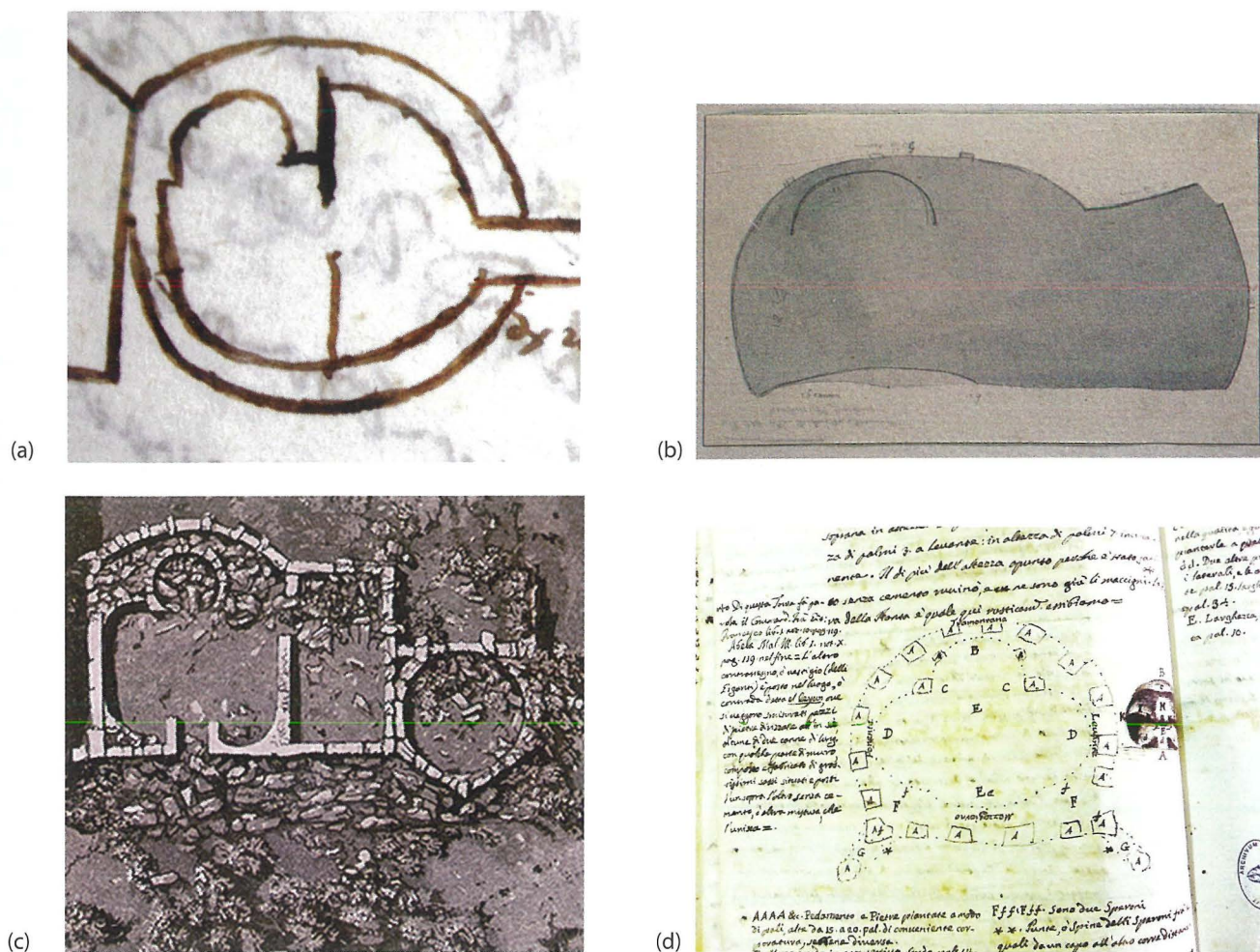


Figure 3. Plans of Ġgantija in (a) the notarial act (1776), (b) Ducros (1778), (c) Hoüel (1787) and (d) Pelagio (before 1781). Images (a), (b) and (d) are reproduced courtesy of Notarial Archives (Valletta), Rijksprentenkabinet - Rijksmuseum (Amsterdam) and Mdina Cathedral Archives respectively.

photograph) shows that the plan provided by Ducros is the most precise in giving a general representation of the temples. This observation is supported by the depiction of the outline of the northern walls of the temples, the obtuse angle between the two buildings and the portrayal of the collapsed northern corner. Although measurements are noted on Ducros' plan, it is not totally accurate considering the skewed shape of the depicted apse and other details in the outline.

Pelagio's plan shows the outline of three semi-circular spaces in the form of a clover leaf. Considering that it is only the northern building of Ġgantija that has a terminal niche this suggests that the spaces represented are the innermost three apses of the southern building. Only the inner apse of the southern building is consistently shown in the four plans, with Hoüel's plan also showing the curvature of three other spaces (i.e. 3c; 2, 3 and 6 in Fig. 1). In view of the above, it is here proposed that at least the upper part of the terminal apse of the southern building was already exposed in the eighteenth century, undoubtedly due to the fact that it reaches a 'greater height than those of other parts of the building' (Evans 1971, 176). Debris in the other parts of the southern building made interpretation difficult, with the different authors giving different details of these areas.

No details of the interior of the northern building are given in the four plans, revealing that it was probably still covered with debris. This lack of detail is also seen in Smyth's lithographs (1829, pls 26 and 28) and an illustration published by Grima (2004a, 17 lower photograph). As in Pelagio's plan, the northern building is not shown in an illustration loosely dated to 1830 (Anon 2005, 29). In contrast, the outline and details of the southern building are shown in plans of the 1820s. This may either indicate a phased clearance of Ġgantija in the early 1820s or the frequent contemporary reproduction of drawings representing mainly the southern building.

In the notarial plan and Hoüel's travelogue the two buildings forming Ġgantija are already discernible and shown to be interconnecting. No connection has however been revealed archaeologically (Evans 1971, 173) and the temples already appear separate in a view provided by Mazzara (1827, pl. 3). Another feature of note is the circular enclosure only shown by Hoüel (1787, pl. 251) adjacent to the temples. This detail has recently been used in arguments for an ancient burial mound on site (Azzopardi 2011, 11). Nonetheless,

such a feature is missing in the other plans in Fig. 3. With Hoüel (1787, 80) clearly stating that he used his 'artistic eye' (*l'œil de l'artiste*) in the interpretation of walls on site, further work needs to be done on site to support such claims

Passage to Ġgantija

The passage leading to Ġgantija (*passaggio per la Torre del Gigante*) shown in the notarial plan as well as the lithograph given by Smyth (Fig. 4, point A) is a reminder that in the past access to the megalithic complex was from the east and that it was only in the twentieth century that an approach from the west was created (Grima 2004a, 30-31). The passage was already in existence when the 1776 contract was drawn up as no reference to its creation was made there. The presence of such a passage is significant. On one hand it may reveal that by the third quarter of the eighteenth century interest in visiting Ġgantija was such that a path leading to it was already in place. On the other hand, it shows that access to Ġgantija was secured without disturbing surrounding lands leased mainly for agricultural purposes for which a separate access was provided. The balance reached between the rights of land-tenants and access to an area containing ancient remains emerges as remarkable and it was many decades before it was adopted in other megalithic sites. Indeed, when one considers that a similar thoroughfare to Haġar Qim, another megalithic complex, was not available for decades, and led in one case to the injury of George French Angas (1842, 41) in the mid-nineteenth century, and was still the subject of negotiations to secure it in 1908 (NAM-CSG01-1092/1908), the significance of a path already existing at Ġgantija in 1776 stands out in contrast.

Caves

Two separate caves, simply marked as *grotta*, appear in the notarial plan in a landscape later described as having 'various troglodytic grottos' (Smyth 1829, 295) and 'full of large and small natural caves' (Evans 1971, 179). The caves shown in the notarial plan could be natural caves as the southern part of Xagħra is known to have numerous karstic caves, such as l-Għar ta' Ninu (Caruana 1889). The use in prehistory of the caves shown in the plan cannot be excluded particularly as caves in the area such as the Brochtorff Circle, the North Cave, l-Għar ta' Ghejżu and a cave explored in 1954 (Evans 1971, 179, 183) are well known Temple Period sites which made use of underground caves.

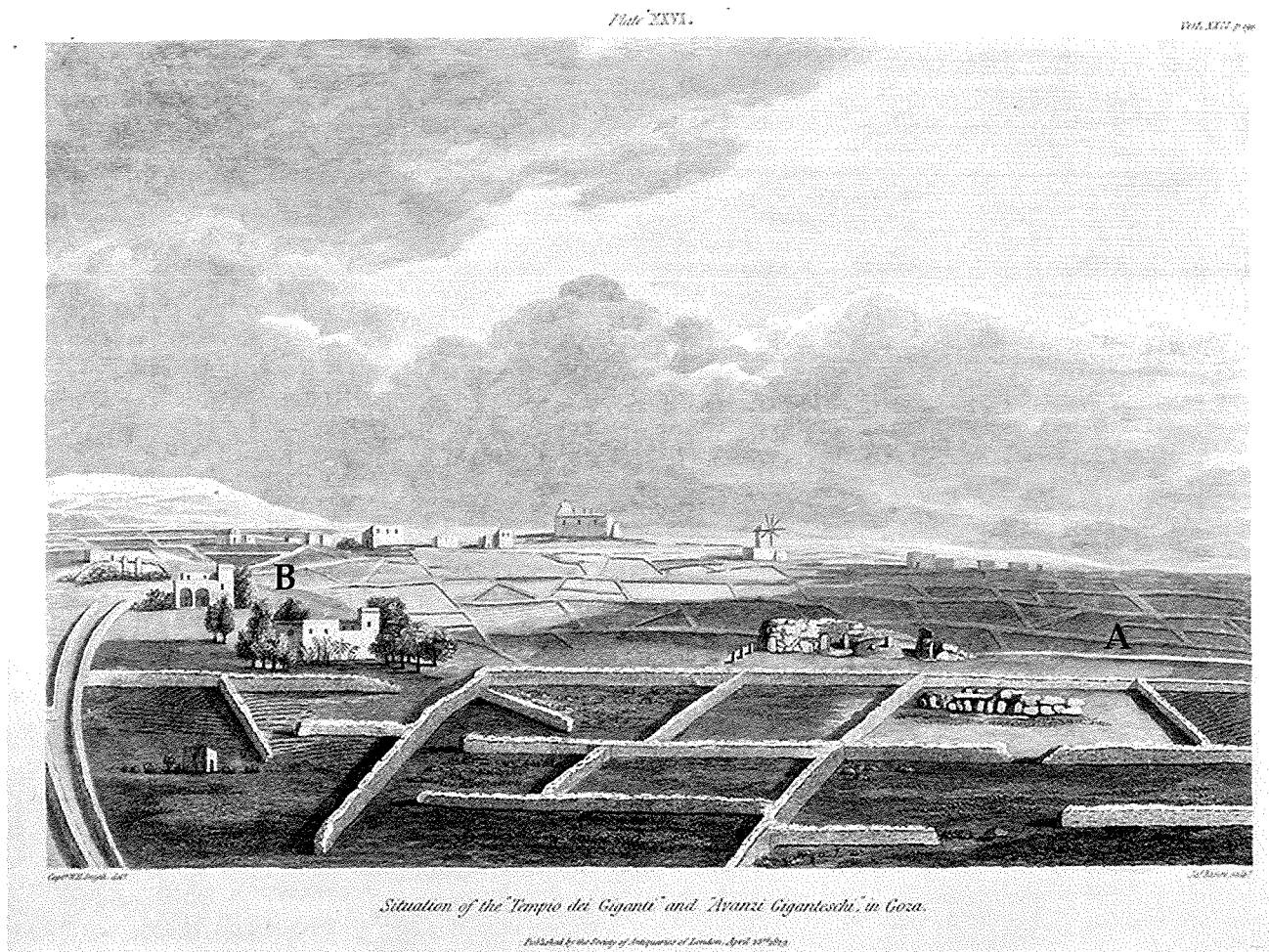


Figure 4. Lithograph of Ġgantija and surrounding lands (after Smyth 1829). A=path, B= buildings and trees.

A third possibility is that they are prehistoric tombs, as the area is known for such features (Zammit 1927, 3; Malone *et al.* 1995). Judging by the size shown on the plan, it may be loosely conjectured that the cave along the passage is more likely to be a natural feature in view of its large size. On the other hand, in view of the small size of the depicted opening of the cave to its north, this may well be an ancient tomb, but a more recent date cannot be excluded in view of the fact that it is a prominent feature within a small enclosure.

Spring

The contract clearly refers to a fountain of running water in a man-made underground cave (NAV, Not. Paolo Vittorio Giammalva R292/24 f. 698r) which can safely be identified with the cave (*grotta*) located near the western buildings and described as being under the lands of neighbouring tenants. The plan shows this cave as roughly circular in shape with rectangular

recesses in the north, west and east directions. The cave had an opening to the south leading to a space bounded by a curved wall with a controlled access. To the east of Ġgantija, Pelagio documented another underground space with similar features (MCA, Misc. 55, ff. 143v-144v). The location and dating of these caves remains unknown and both deserve to be located and studied further.

Mention of a spring in the contract is not surprising in an area known since medieval times as Tal-Ghejun (see above). Already at the time, the abundance of water was utilized to support gardens planted with trees, a feature which is documented near the buildings to the west of the lands in the 1776 contract and accompanying plan, as well as in Smyth's lithograph (Fig. 4, point B). The abundance of underground water and springs is still evident today through the presence of reeds and trees at this location.

If Grima (2004b, 341-42) has noted the frequent occurrence of water sources close to Temple Period megalithic buildings, the evidence put forth in the present paper points to the location of at least one potential source of water close to the concentration of Temple Period remains in southern Xagħra (Gozo), in the vicinity of the Brochtorff Circle. It is tempting to reread the local prehistoric landscape visualizing the Brochtorff Circle, l-Għar ta' Għejżu, megaliths at Vella's farm and Ġgantija as linked (Grima et al. 2009, 61) and distributed around an area with hydrological potential and possible accompanying vegetation. Such water source would have been important considering that environments with relative local scarcity of water have been noted at least in the early phases of the Temple Period at the nearby Brochtorff Circle (Schembri et al. 2009, 38-9). An archaeological, geological and hydrological survey of the area is needed before a definite position can be made on this hypothesis, particularly as more than one spring is implied by the plural Tal-Għejjun, the toponym of the area.

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Anton Bugeja
42, "Tbissima"
Triq is-Salib
Siggiewi SGW3301
MALTA
antonbugeja@hotmail.com

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- Anton BUGEJA** M.D. is a family doctor by profession who also has a keen interest in Maltese archaeology. He is a committee member of the Archaeological Society Malta and deputy editor of the *Malta Archaeological Review*.

Xrobb l-Għaġin revisited: recovery and discovery

Ruben P. Borg and Reuben Grima

The purpose of the exercise reported here was to establish whether and to what extent the remains of the megalithic building at Xrobb l-Għaġin survive today, as part of a wider discussion of vulnerability of the archaeological resource in coastal environments. This goal has been achieved, through an examination of the archival record created a century ago, and observations of the remains that are visible on the surface of the site today. In addition, an unexpected discovery was made, which promises to shed new light on attitudes to monumentality and its landscape setting in Late Neolithic Malta.

Any discussion of the megalithic remains at Xrobb l-Għaġin must begin with a firm health and safety warning. The site is extremely dangerous to approach, as it lies at the very edge of a deeply undercut cliff-top. This was already the case when the site was discovered and excavated a century ago. In the first printed description of the site, it was noted that 'It is clear that a portion of the monument, perhaps the greater portion, was carried away along with the rock on which it was built during the comparatively rapid decay of the cliffs' (Zammit 1915, 2). A more detailed report published shortly after added that '[...] the collapse of the rest [of the megalithic building] may not be very far distant, as it is deeply undermined' (Ashby 1915, 209), an opinion echoed half a century later by Evans (1971, 26). More recently, the site has generally been presumed to have been largely, if not entirely, lost to coastal erosion, even being referred to as a 'destroyed site' (Trump 2002, 189).

History of discovery

The discovery and excavation of the megalithic building at Xrobb l-Għaġin took place exactly a century ago, during the halcyon days of archaeological exploration of Neolithic Malta. At the turn of the twentieth century, a wave of interest in Malta's prehistory was

fuelled first by the realization that Malta's megalithic remains had been created by a prehistoric culture, then by the discovery of the Ħal Saflieni Hypogeum. A series of other discoveries and excavations followed. Against this backdrop, the remote headland of Xrobb l-Għaġin witnessed a remarkable gathering of individuals who briefly converged there to collaborate in the exploration of a megalithic structure. The remains were first noted by Mr Carmelo Rizzo, then an architect in the Department of Public Works. On 10 April 1913, he accompanied Themistocles Zammit, then Curator of the Valletta Museum, to the location (Zammit n.d., 45). Zammit's note book entry shows that the layout of a part of the complex could be made out even before the excavation commenced: '[...] the ruins consist of a number of large stones forming probably a circle. At the very edge of the cliff two uprights are still seen broken at the level of the surface. These upright slabs have parallel faces and must have formed an entrance [...]' (Zammit n.d., 45). In December 1914, a brief excavation campaign was undertaken with the assistance of Dr A.V. Laferla, a Captain in the King's Own Malta Regiment (Ashby 1915, 210) and later Director of Education, '[...] who was for a time encamped in the vicinity' (Zammit 1915, 2). This excavation campaign, which extended into January 1915, revealed the core of the megalithic complex, including the monumental paving and

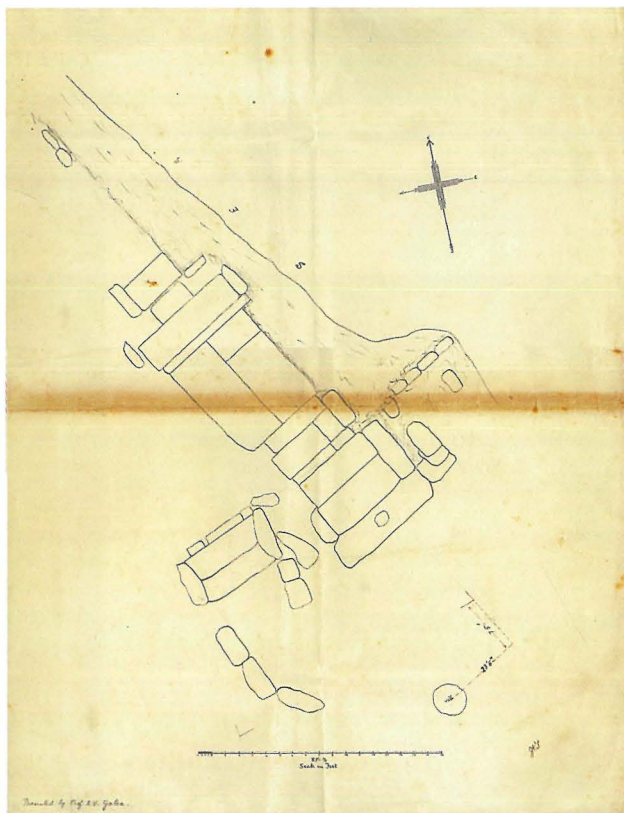


Figure 1. Plan of first phase of excavation of Xrobb l-Għagin megalithic remains, held in the archives of the National Museum of Archaeology, Heritage Malta.

‘dolmenic niche’ on the principal axis of the building (Zammit n.d., 104-105; Zammit 1915, 2). The carefully finished and decorated megalithic slab that roofed the ‘niche’ is today displayed in the National Museum of Archaeology. The archives of the same Museum hold an undated plan of the site which bears a note saying ‘Presented by Prof. R.V. Galea. 12.2.49’ (Fig. 1). Galea was a young architect at the time of the excavation, who was later to serve as Rector of the University of Malta, helming it through the difficult period of the Second World War. The plan in question appears to be a measured drawing, first drawn in pencil, perhaps on site, and then redrawn in ink. While it is unclear if it was drawn by Galea himself, here it will be referred to as the Galea plan. The plan was probably drawn during this first campaign, as the extent of the megalithic remains shown closely matches the extent of excavation in the written record and in the photographs dated January 1915, held in the archives of the National Museum of Archaeology.

A second excavation campaign was undertaken over ten days in May 1915, under the supervision of Thomas Ashby, then Director of the British School at Rome (Ashby 1915, 210). The knowledge of the site

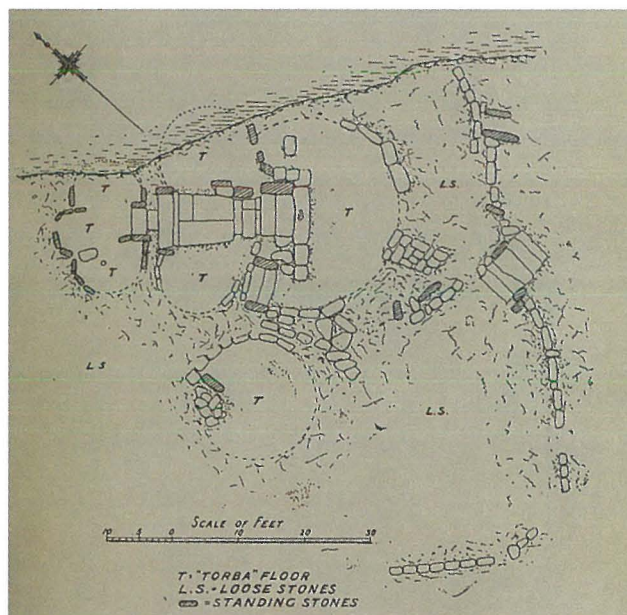


Figure 2. ‘Plan of Neolithic Remains at Xrobb l-Għagin on the East Coast of Malta, surveyed in May 1915’ (Ashby 1915, 209).

that has come down to us in the published record is entirely the result of these two brief campaigns. The results of the second campaign were published in a brief but informative report (Ashby 1915), which included a plan of the extent of the megalithic remains revealed by the end of that campaign (Fig. 2). A curious detail is that while the report repeatedly refers to ‘chamber A’ and ‘chamber D’, neither label appears on the plan in the same report. A sketch-plan in Ashby’s notebooks, held at the British School at Rome clarifies matters, as it refers to the semi-circular enclosure as ‘A’, and to the southernmost chamber of the apsidal building as ‘D’.

The description provided by Evans (1971, 26-27) is clearly a summary based on this report and that in the Museum Annual Report. The plan provided by Evans is also redrawn from that in the Ashby 1915 report, with some simplification. Practically all subsequent publications that have included a plan of the site have redrawn or copied Evans’s version of the plan, with some loss of detail. Likewise, most discussions of the site subsequent to Evans’s (1971) have been based on his description. One important characteristic of the megalithic building is that it is located on steeply sloping terrain. As noted in Ashby’s report, ‘[...] owing to its situation it does not altogether conform to the normal plan’ (1915, 210). Descriptions of the site from Evans onwards have noted that the semi-circular enclosure at the heart of the complex, and the more linear wall along its SE end, and the traces of an

external wall beyond it, do not conform to the typical plan known from other complexes, without however making any reference to the topography. This point will be returned to below.

Relocating the site

The first difficulty faced by anyone trying to reconcile the record of the site with the remains that may survive there today is that the plans created in 1915 do not include any external reference point apart from the position of the cliff-edge itself, which of course could not be treated as a stable reference point. The position of a well is plotted onto the Galea plan, and is also mentioned at the end of the Ashby report (1915, 213), however no trace of it could be found. Further confusion around the location of the site was created by the fact that on the 1:2,500 Survey Sheet published in 1972, the label 'Megalithic Remains' appears about 80 m north-west of the actual location of the building. The problem is compounded by the fact that in the early 1970s, many of the field-walls and other features that could have served as a reference point were cleared away to prepare the site to accommodate the Deutsche Welle radio relay station, which was in use for over two decades, from the mid-70s to the mid-90s. The site fell within the precincts of the station, and was therefore difficult to access for health and safety reasons. Notwithstanding the above, most archaeological publications that discuss the site refer to the correct general location, but stop short of identifying any specific features corresponding to the original plan.

In 2011, a Nature Park and Sustainable Development Centre was inaugurated in the area previously used by the relay station, providing a more suitable context for the preservation of the archaeological remains and their setting, and providing the opportunity for the exercise reported here to be conducted.

Assessing extent of cliff-top erosion over the past century

In view of the uncertainty surrounding the precise position of the site, its orientation, and the extent to which it had been lost to the elements, it was decided to start from first principles. In order to gain a better understanding of the changes the coastline had undergone over the past century, all survey sheets and aerial photographs produced since 1910 were systematically compared using two procedures.



Figure 3. Ashby's plan superimposed on a 2012 orthophoto of the site. The position of the floor of the gully is indicated with a dotted line (Orthophoto source: MEPA).

The first was to digitise and superimpose key features that appeared on these documents, including the edge of the cliff. While the result showed no major changes to the coastline, the accuracy of the procedure was limited by the different methods that had been used to produce the different documents, particularly when trying to compare aerial photographs to the 1910 survey sheet.

The second procedure that was used was to plot reference lines between known and suitably located fixed points that appeared on successive survey sheets and aerial photographs, in order to compare the position of the cliff edge to these reference lines. This proved to be a more practical tool to allow comparison between successive aerial photographs. Within the limitations of the procedure, no significant change to the cliff edge during the last 100 years could be detected.

Defining the position of the megalithic remains

Following this encouraging result, the area believed to be the site of the megalithic remains was closely inspected, and the main surviving visible megaliths were measured and plotted with a total station. Through an iterative process of repeat visits in different seasonal conditions, and reconciliation with the archival record, the position of the remains recorded in 1915 was identified (Fig. 3). A number of megaliths visible on site could be identified with specific megaliths recorded in 1915. A mound that was observed on site appears to correspond to the mound that is visible in the 1915 photographic record, immediately north-west of the megalithic building. When allowance was made for the systematic error

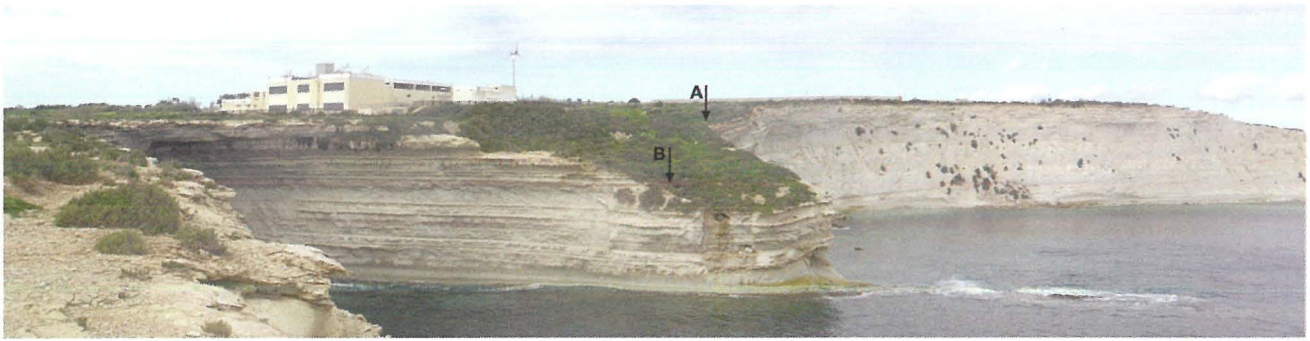


Figure 4. View from the south, showing position of megalithic remains excavated in 1915 (A), and of the gully where a megalithic structure was discovered in 2015 (B). Note the cave being formed by water action, immediately below the gully.

that may be introduced when taking measurements on a steep slope, the distances between visible megaliths corresponded with the plan published by Ashby in 1915. Some additional possible megaliths were noted a short distance to the south-east, which were not included in the 1915 plan.

One of the striking characteristics of the site that emerge from the excavation record is the sharp changes in level between different sections of the megalithic complex, because the main axis of the building runs NW-SE, along the line of steepest slope. A very distinct break of slope and change in level was observed along what is believed to be the edge of the semi-circular enclosure, providing further corroboration of the location of the complex. The steps connecting different levels reported by Ashby are a distinctive feature of this megalithic building on a slope.

The orientation of the plans from the 1915 excavation was also not entirely clear. A discrepancy was noted between the orientation of the North pointer on the Galea plan, and that published by Ashby in 1915 (Evans, and consequently all other subsequent authors, follow the latter orientation). The

most plausible explanation for this discrepancy is that the Galea plan shows uncorrected magnetic north, probably taken directly off a compass reading while on site. The plan published by Ashby, on the other hand, appears to have been corrected to grid north, and was found to correspond quite closely to the orientation of the remains observed on the ground in 2015.

A new discovery of a megalithic structure

Even as the exercise to define what survives of the remains recorded in 1915 was being concluded, a new discovery was made. On 7 February 2015, one of the present authors (RPB), while making a further attempt to relocate the 'well' recorded by Galea, examined a gully that runs perpendicular to the cliff edge, a short distance to the south-east of the megalithic structure (Fig. 4). The sides of the gully drop steeply to its floor, which slopes gently to the edge of the cliff. A number of megaliths were observed protruding from the sides of the gully, several of which are evidently *in situ*, forming part of a previously unrecorded megalithic structure.

The fact that the remains within the gully have gone unnoticed until now is due in large part to the fact that it is densely overgrown and relatively inaccessible from land, and perched high above the shoreline. Erosion over the past century may also have contributed to make them more visible today. A passing reference at the end of Ashby's report to 'uncertain traces of walls further down the slope of which nothing certain could be made' (1915, 213) does not appear to be related to the gully.

In spite of the dense undergrowth, at least 15 megaliths could be made out around the inner end of the gully. Several of them are clearly still *in situ*, and appear to be lining and buttressing the earth fill around the edges of the gully (Fig. 5), while others appear to

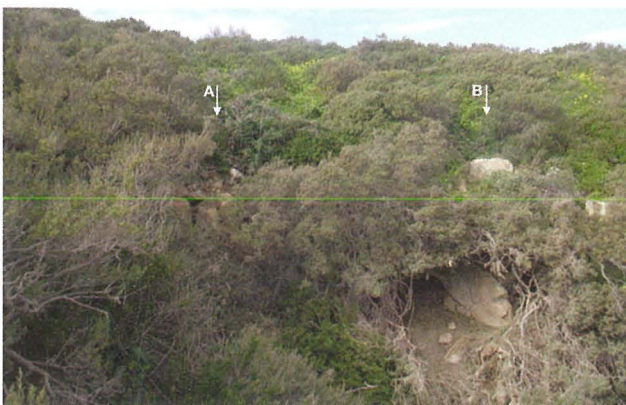


Figure 5. View from south edge of gully, looking north-west. A cluster of *in situ* megaliths (also shown in Fig. 6) is visible at the inner end of the gully, to the left (A). Megaliths at two different levels are visible to the right (B).

have buckled or collapsed from their original position. The most typical dimensions fall in the range between 0.5 m and 1 m in height and width, and between 0.2 m and 0.3 m in thickness. Several of the megaliths are laid flat against the edges of the gully. There is at least one instance of a megalith laid in this way being flanked by another orthogonal megalith laid perpendicular to the first, protruding from the wall (Fig. 6), probably as a tie-slab to stiffen the structure, evoking the “header and stretcher” technique familiar from other megalithic sites. Megaliths were observed at different heights around the edges of the gully (Fig. 5), forming steps or terraces and holding back the earth fill behind them, suggesting that the boundaries of the gully may have originally been completely lined with retaining walls in an imposing monumental composition. The seaward edge of the gully is abruptly truncated by the cliff-edge, and may have been considerably modified by erosion since prehistory.

Discussion

The first significant result of the exercise reported here is the confirmation that the megalithic remains discovered and recorded in 1915 have not yet been claimed by coastal erosion, and may still be better preserved than has been generally supposed. The vulnerability of the site, however, is more evident than ever, as it is severely undercut, and poses some pressing challenges and dilemmas in terms of how best to safeguard and manage such a precious archaeological resource in the face of the inexorable erosion of the underlying cliff.

The second interesting observation is that the distinctive layout of the complex is closely tied to the topographic setting. Due to the steep gradient of the ground, the creation of a level, semi-circular space in front of the apsidal structure necessitated the creation of an artificial terrace. A significant break of slope and abrupt drop may still be observed along the SE edge of the terrace. The megalithic features along the south-east end of the complex, which have often been referred to as atypical, may therefore be understood in a new light, as part of the solution to create and retain the terrace forming the semi-circular platform. If this explanation is correct, the layout of Xrobb l-Għagin may be less atypical than previously thought, as the importance attached to a level forecourt is also



Figure 6. Detail of megaliths at the inner end of the gully.

evident at Ġgantija, Mnajdra, and Skorba, albeit at an altogether different scale.

A corollary to this second observation is that the ‘dolmenic niche’ on the main axis of the apsidal building is also closely tied to another sharp change in level, this time between the semi-circular forecourt and the apsidal building itself. It does raise the question whether the decorated slab roofing the ‘niche’, today housed in the museum, was in fact the entrance threshold at the entrance into the building, perhaps approached by steps that have not been preserved, comparable to the monumental steps leading up to the main entrance of Ta’ Hġrat, or the steps inside the main building at Hġar Qim beneath which a group of stone statues was discovered in 1949.

The third and probably most significant result is the discovery in February 2015 of what appears to be the monumental elaboration of the gully to the south-east of the megalithic building, which appears to have been undertaken on a scale as monumental as the building itself. It would be premature to date the newly-discovered feature on the basis of visual inspection alone. One possibility is that megaliths from the known building were reused to build the retaining structure in the gully during some later period as part of the

management of the terrain, possibly for agricultural purposes. If this were to be proved to be the case, it may still yield important boons for archaeology, because of the deep stratigraphy that may be preserved behind the terracing. It is worth recalling that Carmelo Rizzo first discovered the temple at Xrobb il-Għagin after he was intrigued by the considerable depth of red soil in its vicinity, which stood out from the surrounding rock (Ashby 1915, 209-210).

The use of the header and stretcher technique, however, strongly suggests that this may indeed be a prehistoric structure. If this were to be confirmed, the implications for our understanding of the site and its relationship to the landscape setting will be considerable. To date, the management and monumental elaboration of the topography around Malta's Neolithic monuments has been attested by the creation of monumental forecourts known from a number of sites. The management and megalithic elaboration of the gully at Xrobb l-Għagin may be the most remarkable example known to date of the extension of this monumentalisation into the wider landscape, which may yield fresh insight into Neolithic attitudes to landscape and cosmology. It has been argued elsewhere that both water (Grima in press) and the sea (Grima 2001) were significant to the Neolithic islanders on a symbolic as well as practical level. The attention that appears to have been devoted to the gully may equally be tied to the management of the water runoff that flows through it, and to the sea below.

Acknowledgements

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Ruben P. Borg
Department of Construction and Property
Management
Faculty for the Built Environment
University of Malta
Msida MSD2080, MALTA
ruben.p.borg@um.edu.mt

Reuben Grima
Department of Conservation and Built Heritage
Faculty for the Built Environment
University of Malta
Msida MSD2080, MALTA
reuben.grima@um.edu.mt

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Ruben Paul Borg studied Architecture and Civil Engineering at the University of Malta and read for a Specialisation in structural engineering at the Politecnico di Milano and a Ph.D. at the University of Sheffield. He is senior lecturer at the Faculty for the Built Environment of the University of Malta, chairman of the European Council of Civil Engineers for Knowledge and Technology, board member of the International Initiative for a Sustainable Built Environment and member of the Scientific Committee for the Conservation of the Megalithic Temples of Malta. His main research interests are materials science and engineering, sustainable construction and structural vulnerability.

Reuben Grima studied archaeology at the University of Malta and the University of Reading, and read for his Ph.D. at the Institute of Archaeology, UCL. He led the curatorial team responsible for Malta's prehistoric World Heritage Sites before joining the Department of Conservation and Built Heritage at the University of Malta in 2011. His main research interests are landscape archaeology, heritage management and public engagement with the past.

A missing work of art: Zeus, Poseidon, Hades, Asklepios, Serapis, or Herakles?

Anthony Bonanno

This is an edition of a small marble head of a male bearded divinity found in 1924 in an underground space in the area behind the Domvs Romana Museum, Rabat (Malta). It was stolen from its showcase in the 1980s. Its physiognomy qualifies it as a representation of any of the abovementioned divinities. A closer examination of its head cover based on available photographs, however, identifies it as part of a statuette of Herakles.

Certainly one of the finest pieces of Roman religious sculpture ever retrieved from Maltese soil is this smaller than life-size head of fine-grained white marble. It measures 0.12 m high and 0.11 m wide, and represents a partially 'veiled' bearded divinity (Figs 1-2). The quotation marks are justified for reasons that will be given in due course.

It was discovered by Themistocles Zammit in 1924 inside 'a small cave 9' x 8', under the floor of a room', during his excavations in the area north of the present Domvs Romana Museum, in Rabat (Zammit 1924, entry for 24 June). In the Museum Report for the same year Zammit gives more details of his find, including its dimensions and a tentative identification with the god of the underworld Hades, in his own words:

'A remarkably fine head of a marble statuette 12 cms in height and 11 cms at the base of the neck. It, probably, represents Pluto as it is fully bearded and has his head covered by the toga. It is a good work of the Hellenistic period of art.' (Zammit 1925, 4)

In his 1930 guidebook of the same Museum where it was displayed, he extended the possibility of its representation to other divinities:

'of the Hellenistic period [...] is a beautifully carved marble head representing Pluto or another beared [*sic*] divinity with the head covered by a fold of the toga.' (Zammit 1930, 24).

Description

Many today would be unfamiliar with this sculpture because it has been missing from the scene for over thirty years and certain details presented hereunder, as well as the accompanying photographs, were taken in the 1970s. I had, in fact, included it in my dissertation on Greek and Roman sculpture in Malta for my '*laurea in lettere*' conferred by the university of Palermo in March 1971 (Bonanno 1971, 157-60).

The head is broken off the statuette to which it belonged at the level of the lower neck, where the latter starts expanding towards the shoulders. The break also involves the head cover which was detached from the statuette more or less at the same level. Some breakages and abrasions are also visible on the rest of the head cover and in some parts of the beard. The back surface is somewhat coarsely finished with rasp marks covering most areas (Fig. 2d). It is not certain whether the two irregularly-shaped holes at the back were intentional, to enhance the unusual texture of the head cover.

There is no doubt that the statuette represented a bearded divinity with its head and hair partly concealed by a cover of a sort that gives the impression of being a veil. The voluminous beard, consisting of rather thick wavy strands separated by deep channels produced by the running drill, emphasizes the triangular

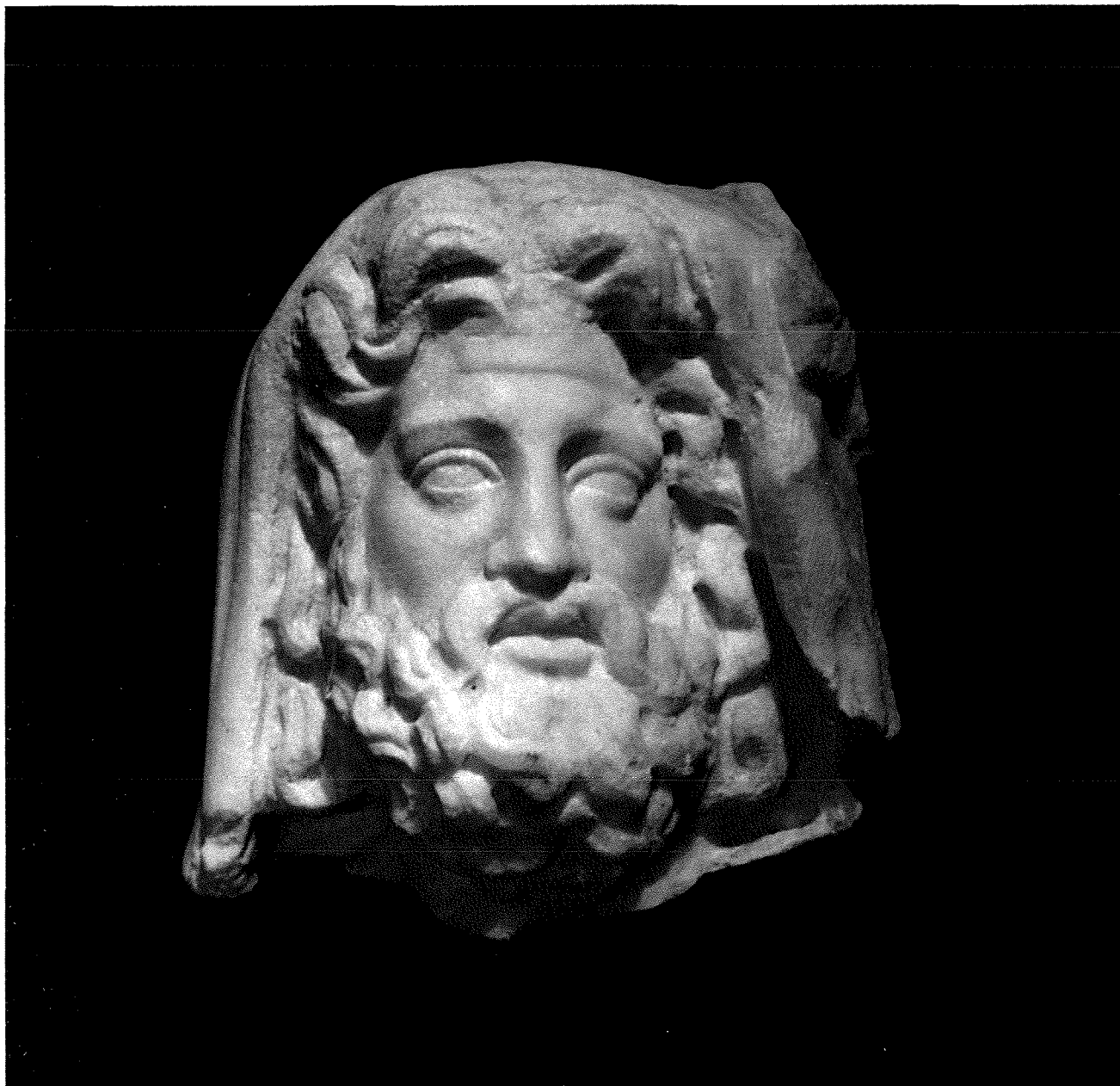


Figure 1. Marble head of a male bearded divinity. (Photograph reproduced courtesy of National Museum of Archaeology/Heritage Malta [NMA 3641]).

shape of the face. The modelling of the latter verges on the *sfumato* and its surfaces produce a contained chiaroscuro effect. The eyes are almond-shaped and dreamy, separated by a broad nose and surmounted by lightly accentuated orbital ridges. Above them a horizontal wrinkle separates the forehead in two. The visible parts of the hair display the same treatment as that of the beard. The mouth is small, with slightly parted fleshy lips.

Iconography

The identification of the divinity here represented is not an easy one. It has to be based on the physiognomic features (shape of head, face, hair style and pattern of beard) as well as the 'veil' or rather, head cover.

The physiognomic typology corresponds to that of a number of Greco-Roman divinities.¹ Foremost among them is Zeus/Jupiter, of whom the Maltese collections include a miniature statuette and, possibly, another head in a private museum, both

unpublished. But the same physiognomy is also found in numerous statues of other bearded divinities, like Poseidon/Neptune, Hades/Pluto, Asklepios/Aesculapius, and Serapis.² The right identification is normally established by means of the other attributes accompanying the rest of the statue, which in this case are missing. The problem lies with the second element in the iconography of the Rabat sculpture, the head cover which, in the finder's description, implied drapery (see above) even though the word 'toga' might not have been intended to be taken literally. The fact is, however, that these five divinities are hardly ever portrayed with a covered head.

For example, our head shares most of the iconographic features with those of a nude statue of a standing Zeus, with his recognizable attributes, from Cyrene (Todisco 1993, 104, pl. 218). The statue is signed by Zenio, son of Zenio and dated to AD 138. It is thought to be derived from the Zeus Brontaios of the fourth-century BC sculptor Leochares, dated to circa 375 BC. The statue, however, is bare-headed.

A similar nude statue of a bearded divinity with the same head typology from Caesarea Mauretaniae (present day Cherchel, Algeria) is identified as Poseidon from its attached attributes, such as the dolphin by its right leg (Landwehr 2000, 84-6, no. 111, pls 46-50). The head, however, is not covered.

The same physiognomy and the same hair, moustache and beard patterns are portrayed in the head of a statue of Asklepios in the Museo Gregoriano Profano (AM3) of the Vatican, though the face is more rounded (Meyer 1994, 7-55, especially pls 25a, 26a, 27a). Again, the deity is bare-headed.

On the other hand, the iconographic features characteristic of the Maltese head – the triangular shape of the face, the hairstyle (including the two partitioned wavy tresses on the forehead), the format and treatment of the beard, the division of the forehead by a prominent horizontal wrinkle, and the soft graciousness of the expression – are all reproduced in the head of a statue of Serapis from the Isaeum of Gortyn in Crete (Karetsou and Andreadaki-Blasaki 2000, 439-440, no. 508B). This is shown with all the unmistakable attributes of Serapis, a bearded god whose association with Cerberus, the three-headed dog that guarded the underworld, makes him identifiable also as Hades/Pluto. But, again, he is unveiled, while his counterpart, Isis, is veiled. Both statues have been dated to the 'late Antonine age (180-190 AD)'.

On a closer look at the Maltese head, however, which can only be based on the available photographs since the marble itself is missing, the head cover appears to be of a different material than just drapery. It is far thicker than expected, and the side views, especially the left side of the head, point to some very different type of cover, a cover of different shape and consistency, such as an animal skin. This detail brings to mind the lion's skin, the attribute par excellence of Herakles/Hercules, another divinity who had all the prerogatives of religious worship in antiquity, including temples and sanctuaries.

Herakles was perhaps the most renowned and popular hero of Greek mythology and in time he became one of the most widely worshipped divinities in the ancient world and, as a result, the most represented in ancient art (Boardman *et al.* 1988). Born of the union of the great Olympian god Zeus and the mortal Alkmene, wife of king Amphitryon of Thebes, he incurred the persecuting enmity of the goddess Hera, the jealous wife of Zeus. For this he had to endure the famous 'labours' at the service of Eurystheus, king of Tiryns and Mycenae, and most of his representations in art gravitate around these labours. His most distinguishing attributes are the invulnerable lion skin and the club. Most agree that the lion skin was that of the Nemean lion which he killed as one of his labours. He is sometimes shown wearing it with its head serving as a helmet and its front paws knotted in front on his chest. The club was carved from the trunk of an olive tree also from Nemea, or from another source. He is sometimes represented with a clean-shaven face but much more often with a full beard.

Except for the hair over the forehead and the absence of the head cover, the rest of the Malta head resembles very closely the colossal head of Herakles from Pergamon, now in Berlin (Damaskos 1998: 129-36). Another telling comparison is with the head of a marble statue of a seated Hercules from Alba Fucens (Latini 1994, 475-77). It has the same structure of the face and beard and a very close similarity in the shape of the eyes, the nose and forehead and in the modelling of the mouth. The hair, however, is quite different, based on very small curls which leave the ears visible, and instead of the head cover it wears a laurel crown of *Hercules Invictus*.

The iconography of Herakles includes several depictions of him with his head covered by the lion skin (the *leonté*), especially on coins (Boardman *et al.* 1988, nos 117-163, 243, 377, 465, 468, 576, 639,



Figure 2. Marble head of a male bearded divinity. (Photographs reproduced courtesy of National Museum of Archaeology/Heritage Malta [a. NMA 3644, b. NMA 3643, c. NMA3645, d. NMA 3646]).

650, 735). The following examples are limited to a few sculptural ones.

A statuette of Herakles with his head covered by a lion's skin, dated to the third quarter of the fourth century BC, comes from Athens but it

depicts a young, clean-shaven version of the divine hero (Kaltsas 2002, 264-65, no. 553). Another such statuette head in the Glyptotek of Munich belongs to the more diffused type of Herakles' iconography, i.e. with short curly hair, rather than wavy as in the

Maltese head (Fuchs 1992, 157-162, no. 22, figs 159-63). Another head of the same bearded type and with head partly covered by the lion's skin, but with small curls in the hair, is paired with the head of Omphalos on a double-herm in the Museo Civico of Treviso (Galliazzo 1982, 104-106, no. 31). Finally, another head of the same size depicting a bearded Herakles with head framed by the lion's skin comes from Fano, Italy (De Marinis *et al.* 2002, 78-79). The incisions of the pupils and irises place this head a few decades later than the Maltese one.

The beard typology of the Maltese head, with its several layers of curls thickening down under the chin, follows that of the Weary Herakles by Lysippos, several versions of which are housed in the Boston Museum of Fine Arts (Comstock and Vermeule 1976, 66, 106-107, 138, nos 104A, 163-64, 216; Vermeule and Comstock 1988, 34-36, no. 22). But, again, in the Rabat head the hair is significantly different, being parted in the centre over the forehead and rising in two conspicuous waves on each side. These are, on the other hand, reproduced almost identically on a much larger head, datable to the second half of the second century AD, in Geneva which, however, has been identified as an Asklepios, not clear on what grounds (Chamay and Maier 1990, 27, no. 27, pl. 33). While its heavy use of the running drill justifies an Antonine date, this head seems to have been veiled but lacks the whole head cover which was attached separately. The pattern of both the hair and beard are repeated on a life-sized head, identified as 'Zeus (?)' and dated as 'Late Hellenistic, perhaps ca. 50 BC', in the Williams College Museum of Art, Williamstown, Massachusetts (Vermeule 1981, 157, no. 124).

The turn of the head, the horizontal division of the forehead, the soft treatment of the eyes and flesh surfaces, as well as the general calm expression of the Maltese head are found in a head of Herakles, albeit without the headgear, in the Ny Carlsberg Glyptotek, Copenhagen (No. 621: Moltesen 2000, 116-17, pls 86-88). It too recalls the Lysippean Weary Herakles.

So, really and truly, there is no perfect parallel for the Rabat head among the standard sculptural portrayals of Herakles, or else, if such a parallel exists, I have not managed to find it. For this reason I cannot really connect its iconography to any of the types of Herakles' plastic representations, even less so to any prototypes mentioned by the ancient authors.

In spite of this I am convinced of my identification, based mainly on the facial physiognomy and the pattern and style of the hair and beard – even though these, on their own, could fit well, as we have seen, with the iconography of at least five other Greco-Roman divinities. The determining feature that connects the head with Herakles is, however, the head cover which could not be other than a lion skin. This is confirmed by rasp marks finish of its surface, the bulges behind the left temple – one of which looks like an animal ear – and the thick-set folds below it (see, in particular, Figs 1, 2b and 2c).

The size of the head could fit either on a free-standing statuette or on a figure in high relief, for which I would cite as parallels two marble sculptures in the Vatican Museum, both of which show Herakles wearing the lion skin over his head: a square-shaped relief panel (Amelung 1908, 79, pl. 21), and a free-standing statuette (Amelung 1908, 213, pl. 34).

As for other sculptural representations of Herakles in a Maltese context one should also mention two small marble heads, one of which was a small herm, probably intended to be affixed to a table support, and the other might have been sawn off from a relief decorating a sarcophagus (Bonanno 1977; *LIMC* IV, 1-2, nos 1198-99). They are held in the reserve collection of the National Museum of Archaeology. Unfortunately, their provenance is still unknown.

Earlier on I mentioned the many sanctuaries and temples dedicated to Herakles in antiquity. One such sanctuary was placed in Malta by the second-century AD geographer Ptolemy (*Geogr.* IV, 3, 13), and his cult is documented by two bilingual inscriptions, in Punic and Greek, of the second century BC (*Corpus Inscriptionum Graecarum* III, 5753; *Inscriptiones Graecae* XIV, 600; *Corpus Inscriptionum Semiticarum* I, 122 and 122bis), although some doubts have recently been raised on their original provenance from Malta (Amadasi Guzzo and Rossignani 2002). In those inscriptions Herakles appears as the Greek counterpart of the Punic god Melqart in the Punic versions. Melqart is also said to be represented by an orientalising bearded head on Maltese coins of the last two centuries BC (Perassi and Novarese 2006, 2391, n. 62). Various attempts have been made to determine the physical location of this ancient temple, some dating back to the sixteenth and seventeenth century. Jean Quintin (1536, f. A4), basing himself on the co-ordinates given by Ptolemy, placed it near

the Marsaxlokk harbour. His location was supported by Abela (1647, 108) and Niderstedt (1660, 17). Tancred C. Gouder (1991, 17) suggested that the Punic square tower in Żurrieq might be part of the remains of such a building. The most recent attempts have sought to identify the shrine with the remains of a building hurriedly and incompletely 'excavated' by personnel from the British Navy in 1960 at Ras ir-Raġeb on the west coast of Malta (Buhagiar 1988; Vella 2002). So far the evidence brought forward is very tenuous and the identification remains largely hypothetical.

Archaeological Context

The circumstances of the discovery of this marble head suggest that the structure above the surface under which it was found belonged to the residential quarter of the ancient town of Melite, in very close proximity to the stately Roman house which produced a group of imperial portrait statues. Zammit (1925, 3) is quite explicit about this when he states that 'It is clear that the rooms to the north of the Roman house were of a later date, and quite independent of the Villa'. In view of this archaeological context, I do not think that the head can be used to argue for the existence of a temple in the area. Its size, on the contrary, suggests a domestic context. If correct, moreover, such a context would confirm that the cult of Heracles was not limited to the state religion, but extended also to the household, as in the rest of the ancient world.

Date

Although Zammit was right in seeing a strong Hellenistic content, the head should be assigned to the Roman period. The iconographical and stylistic similarities to other sculptures cited above, as well as the carving technique, involving considerable use of the running drill in the rendering of the hair and beard, in 1971 made me assign the head to the second century AD (Bonanno 1971, 160). But because of the absence of the incision of the pupil and iris in the eyes it would be preferable to assign to it a pre-Antonine date and place it in the Flavian or Trajanic period when the running drill started to be used more freely and the plastic rendering of the eyes had still not been introduced.

Missing

This art piece was exhibited in the lower storey of the small museum that was built over the remains of the Roman *domus* of Rabat soon after its discovery (Zammit 1930, 24). This is where I saw it for the last time, in one of the two central old showcases – showcases G and F according to Zammit (1930, 22-24) – on the east side of the *domus* peristyle. And it was from here that it was stolen sometime around 1981. A strong appeal is here made for its return to the common national, and international heritage, to which it rightly belongs. It certainly cannot be properly 'enjoyed' by its present possessor. That person will also be able to enjoy it freely together with the rest of the community once it is back in the showcases of the *Domus Romana* Museum.

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Anthony Bonanno
Department of Classics and Archaeology
University of Malta
Msida MSD 2080, MALTA
anthony.bonanno@um.edu.mt

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Anthony BONANNO is Professor of Archaeology at the University of Malta. A graduate of the University of Malta (B.A. Hons), he holds a Ph.D. in Archaeology of the Roman Provinces from London University and a Doctorate in Classics/Archaeology from the University of Palermo. His specialities are Roman portraiture and Maltese prehistoric archaeology as well as that of the Roman period.

Notes

- 1 I shall be giving both the Greek and the Roman names of these divinities the first time, but I shall shift to only the Greek name thereafter, since the iconography of all these divinities was of a Greek origin in the first place.
- 2 For a discussion of the attribution of types to different divinities see the *Lexicon Iconographicum Mythologiae Classicae* (hereafter LIMC 1981-1999) under the respective entries and Agnoli (2002, 138-40, no. I. 40). Agnoli traces these types back to a model created at the end of the fifth century BC within the circle of Agorakritos, which was then readapted in the following centuries.

The underwater aviation heritage of the Second Siege of Malta

Anthony Burgess and Timmy Gambin

Between the years 1940 and 1943, the skies over the Maltese islands and their surrounding seas witnessed some of the most intense aerial combat of the Second World War. The prolonged duration of this conflict in a relatively well-delineated area has resulted in a submerged legacy that bears witness to a period of rapid advancement in aviation technology. After discussing the potential size of this cultural resource, this paper will explain why all of the in situ aircraft remains from this conflict now exist underwater, as well as a working hypothesis as to its composition. This paper concludes by urging a re-appraisal in how this archaeological resource is regarded and treated, advocating a wider holistic approach to construct an 'airscape' of Malta during the Second World War.

Introduction

When Italy declared war on Great Britain and France on 10th June 1940, Malta's fighter force consisted of just four Gloster Gladiator bi-planes (Vella 1995, 3). By July 1943, as a springboard for the invasion of Sicily, Malta was the base for 35½ squadrons consisting of over 600 modern fighters and bombers (Air Ministry 1956, 428). Between these two dates, Malta served as both arena and audience to a struggle between the Allies (primarily Great Britain) and the Axis powers (Germany and Italy) for control of the supply routes to the military campaign in North Africa. Malta, as the only permanent Allied presence between Gibraltar in the west and Alexandria in the east, and occupying a key strategic position in the central Mediterranean, came to adopt a crucial role in this struggle, and the pre-eminence of this role is reflected in the archaeological record.

The Second Siege and the resultant aviation archaeological record

The Second Siege of Malta (hereafter referred to as 'the Siege') was in many ways an embodiment of the new power in twentieth-century warfare – aircraft. While naval forces did play a role, it was principally through

aircraft that the Axis forces attempted to neutralise Malta's impact upon the Mediterranean theatre (Vella 1995; Spooner 1996; Canwell and Sutherland 2008). This was in large part due to Malta's proximity to a large number of Axis airfields in North Africa and Europe, and in particular Sicily (Fig. 1).

The Siege resulted in the large-scale loss of aircraft from all sides, and a number of factors (see *infra*) have had direct and profound consequences for the actual and potential archaeological record, on land and at sea. While this paper will focus upon the crashed aircraft remains from the Second World War (which as will be demonstrated effectively means aircraft underwater), it is important to note that Malta's aviation heritage (of which a large part is subsumed within the wider Second World War heritage) is of course not restricted to this. It also covers tangible infrastructure such as airfields – either in use, abandoned or adapted – and the intangible (e.g. recollections of events such as in Grech 2002), as well as aircraft preceding and succeeding the Second World War. However, restrictions of space will only permit this paper to focus on the material remains of those aircraft that crashed at sea during the Second World War.

Quantification and location of the crashed aircraft heritage
It is beyond the scope of this paper to quantify the full extent and accurate location of the entire underwater

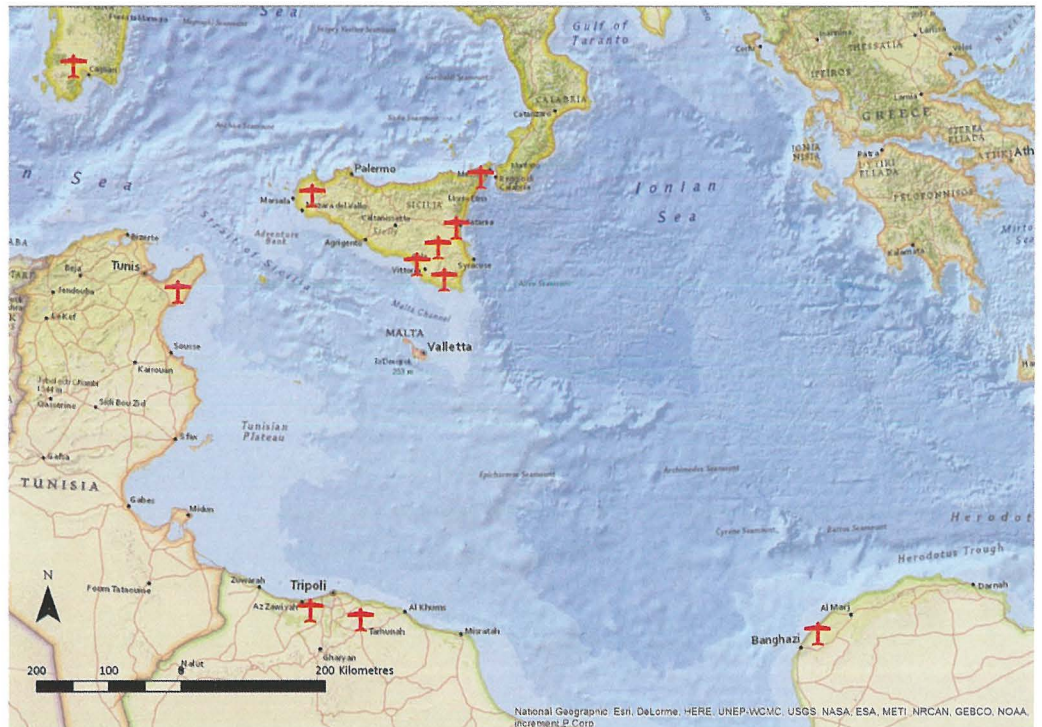


Figure 1. Alone in a hostile sea – Malta in 1941 (after Ministry of Information 1944).

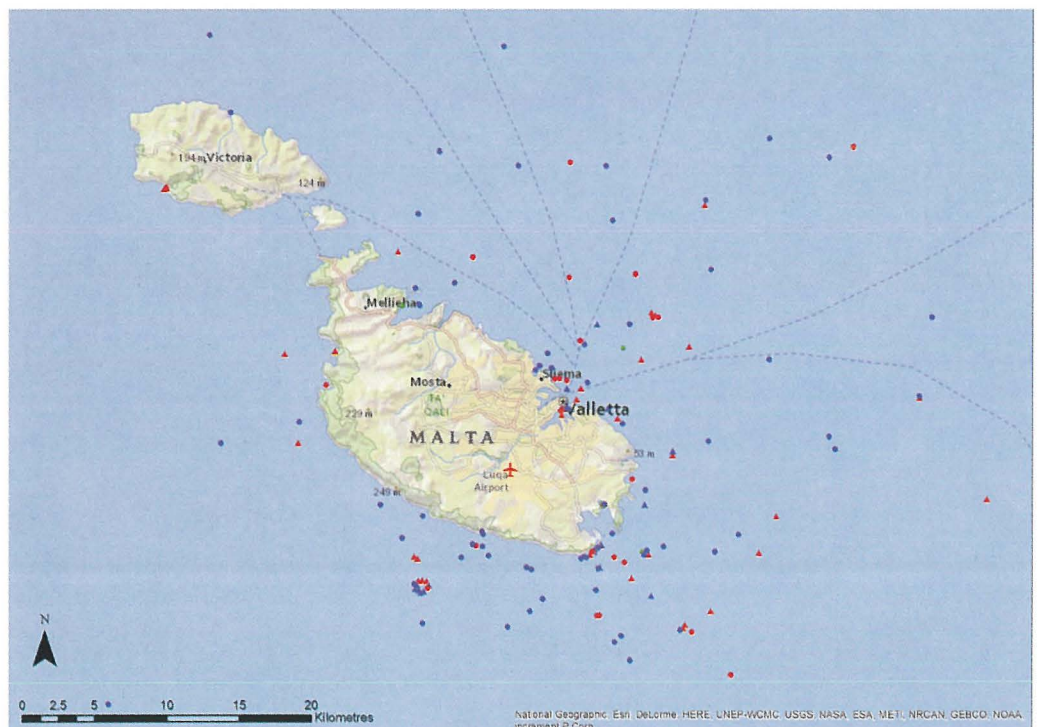


Figure 2. Map displaying aircraft by type (fighters as dots, bombers as triangles) with Allied aircraft in blue and Axis in red. Flying boats/floatplanes (eight in total) are shown in green regardless of country. The apparent concentration of crash sites in some areas (e.g. around Filfla and the southern tip of Malta) are indicative of the lack of precision of much of the location data (see Table 1) as opposed to definitively located crash sites.

aviation archaeology (hereafter, UAA) from the Second World War in Malta. Such an undertaking would encounter a number of challenges, as has been shown by the work of Rogers on (largely terrestrial) aircraft crashes in Malta from 1940-42 (Rogers 2000b). More specifically, claims for enemy losses by the pilot or pilots responsible are not always reliable

due to the distracting circumstances in which they occur (Wessex Archaeology 2008, 27) and aircraft can also be misidentified or not identified at all (Rogers 2000b). If an aircraft did crash, determining its precise location in wartime in a featureless seascape with few reference markers was problematic, with eye witness statements often differing widely (Rogers 2000b).

Where a pilot bailed out and where the aircraft finally crashed can be many kilometres apart (e.g. Galea 2002, 104). If the crew did manage to ditch the aircraft, they may have floated some considerable distance from the crash site (Wessex Archaeology 2008, 24).

The inherent unreliability of reports is then further undercut by the lack of record keeping in Malta. Space on inbound transports to besieged Malta was at a premium. For example, the interiors of gun panels on inbound fighter aircraft were used to transport supplies (Barnham 2013, 46). There was therefore little room for clerks, and some operational reports were compiled months after the events described. Such events were sometimes penned by men who were not even present at these events (Spooner 1996, xviii). Some records may have also been destroyed as was the case with the Luftwaffe (Wessex Archaeology 2008, 27). The log books kept by pilots and later stored were subsequently largely destroyed by the RAF in 1960 (Royal Air Force 2013). Therefore there is an unshakeable unreliability about the figures, even when British, Italian and German figures are compared.

However, an examination of some of the published figures can at least give some indication of the extent of the submerged aircraft record from the Second World War, although any figure must be treated with caution and is impeded by lack of precision regarding different time periods and varying areas of study used. The three main areas which witnessed aircraft crashes pertaining to the Siege were Malta and its surrounding waters, the stretch of sea between Malta and Sicily, and to a lesser degree the coast of North Africa (in particular Tunisia). Estimates are not always clear regarding which areas they relate to. For Axis aircraft, estimates vary from 1,252 destroyed over the island, with another 1,052 probable kills (Canwell and Sutherland 2008, 141), to 1,129 (Ministry of Information 1944, 7), approximately 860 (the RAF via Canwell and Sutherland 2008, ix) to 567 (Mifsud 1989, 77). The Soprintendenza del Mare estimates that at least 800 Italian fighters and bombers alone were shot down or crashed between June 1940 and August 1943, with 90% estimated to have fallen into the sea (Nobili and Palmisano 2010). For the Allies, estimates range from 840 aircraft lost (both on the ground and in the air) (the RAF via Canwell and Sutherland 2008, ix), to 568 (Ministry of Information 1944, 7). Modern estimates place RAF losses at 707 (547 in the air, 160 on the ground) (Ramsey 1975, 19; Canwell and Sutherland 2008, 141), but again no time frame or area is defined.

Despite such wide discrepancies in the figures, one can state with a degree of assurance that the potential is great and in need of further research, although it is again worth noting that arriving at a definitive number and firm location for these cannot be a realistic aim. The fact that a large proportion of these crash sites are submerged has also of course been detrimental to corroboration of witness statements and historical records.

As stated above, the Siege was primarily enforced via aircraft, and was not restricted to the skies above Malta. Allied aircraft used Malta as a base to cover wide stretches of the Mediterranean for numerous tasks including reconnaissance, transport between Gibraltar and Alexandria (and onwards to theatres further east e.g. Burma – see Leather 2012), and attacks on Axis assets on land and sea (Vella 1995; Spooner 1996; Canwell and Sutherland 2008). This far-reaching operational theatre means that the potential for finding Malta-based aircraft in any part of the central Mediterranean, and possibly beyond, is therefore high. Additionally, Malta's central location means that aircraft with little or no direct connection with Malta can also be found in its waters.

Local factors affecting deposition and condition of aircraft wrecks

Malta's geological composition, consisting chiefly of limestone (Pedley *et al.* 1976), with no rivers, marshlands or peatbogs, is not conducive to the preservation of aircraft crash sites on land. This brings it into sharp contrast to other parts of the world (such as the UK), where well-preserved aircraft have been found on land and inter-tidal areas many years after their deposition (EH 2002). In Malta uncontrolled aircraft often disintegrated and/or exploded upon impact with the hard ground (Rogers 2000a, 2000b), whilst the use of dry-stone walling to subdivide fields meant that semi-controlled/controlled aircraft that missed the runway were liable to be severely damaged (Playfair 1956, 45), certainly when compared to landing in a field in England (EH 2002). The tenuous supply situation during the Siege meant that cannibalisation of aircraft was commonplace, as was the adaptation of existing aircraft to meet local circumstances (Rogers 2000b; Cull and Galea 2008). The small size of the islands, the density of their population and their well-developed infrastructure meant that crashes on land rarely went unnoticed and these factors facilitated the ready recovery of crashed aircraft on land.

Grade	Type	Example	Quantity
1	Exact coordinates	34° 36' N, 12° 15' E	11
2	Bearing (point) and distance	DIngli (bearing 154°, 3 miles)	35
3	Descriptive	Dockyard Creek/Fort St Angelo	5
4	Cardinal point and distance	Valletta (5 miles N)	49
5	Cardinal point/bearing and approximate distance	Il-Blata Steps (bearing 210°, 1-3 miles)	2
6	Bearing (country) and distance	Malta (35 miles NE)	20
7	Place and distance	Kalafrana (5 miles)	21
8	Place or Place and cardinal point	Kalafrana or Delimara Point (S)	74
9	Cardinal point from country	Malta (N)	21
10	Significant land mass	Sicily	21
11	Sea with descriptive or cardinal point	Sea (south towards Benghazi)	4
12	Sea (no further details)	When no other information known bar that the aircraft crashed at sea	181

Table 1. Categories of aircraft crashes listed by grade with examples and quantities.

Function	GB	Germany	Italy	USA	Plotted/ Un-plotted	Within 24 nautical miles	Total
Air/Sea Rescue	1	0	0	0	0/1	1	1
Bomber	30	60	16	4	51/59	59	110
Dive Bomber	0	14	1	0	10/5	10	15
Reconnaissance	8	3	1	0	9/3	7	12
Torpedo Bomber	13	0	0	0	5/8	5	13
Fighter	220	29	30	2	133/148	142	281
Floatplane	3	0	2	0	3/2	3	5
Flying Boat	4	1	1	0	5/1	4	6
Unknown	0	1	0	0	1/0	1	1
Total	279	108	51	6	218/226	232	444

Table 2. A sample of the potential submerged aviation archaeological record from the Second Siege of Malta, broken down by aircraft type and country.

As a consequence, the likelihood of finding substantial aircraft remains from the Second World War on the Maltese islands themselves (despite 165 terrestrial crashes being catalogued – see Rogers 2000b) can be categorised as very low. However, there has been some limited success in finding fragments (Rogers 2000b). The high pace of development in Malta is also a threat to these terrestrial crash sites, with large tracts of rural land being cleared to accommodate housing and other building projects (Rogers 2000a). This makes the underwater remains all the more significant.

Mapping the potential underwater aviation archaeological record

Background and Methodology

Using primarily the records of the Allied Air/Sea Rescue (ASR) service operating from Malta, and first-hand testimony and records of such (e.g. diaries) as collated in Galea (2002), coupled with some additional information and corroboration from Rogers (2000b) and the Ministry of Information (1944), it was possible to collect a wide enough database (444 crashed aircraft) with which to conduct a broad statistical and

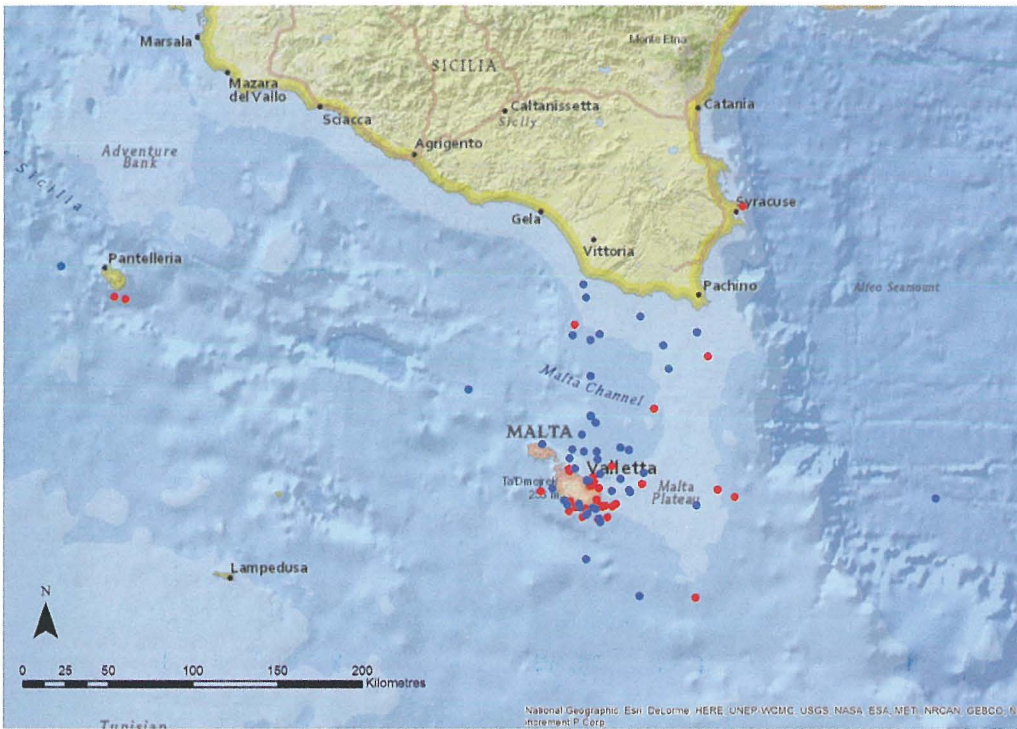


Figure 3. Allied fighter aircraft crash sites (not including Beaufighters) before and after July 1942. Total numbers for pre-July 1942 (shown in red)=41, post-July 1942 (shown in blue)=53.

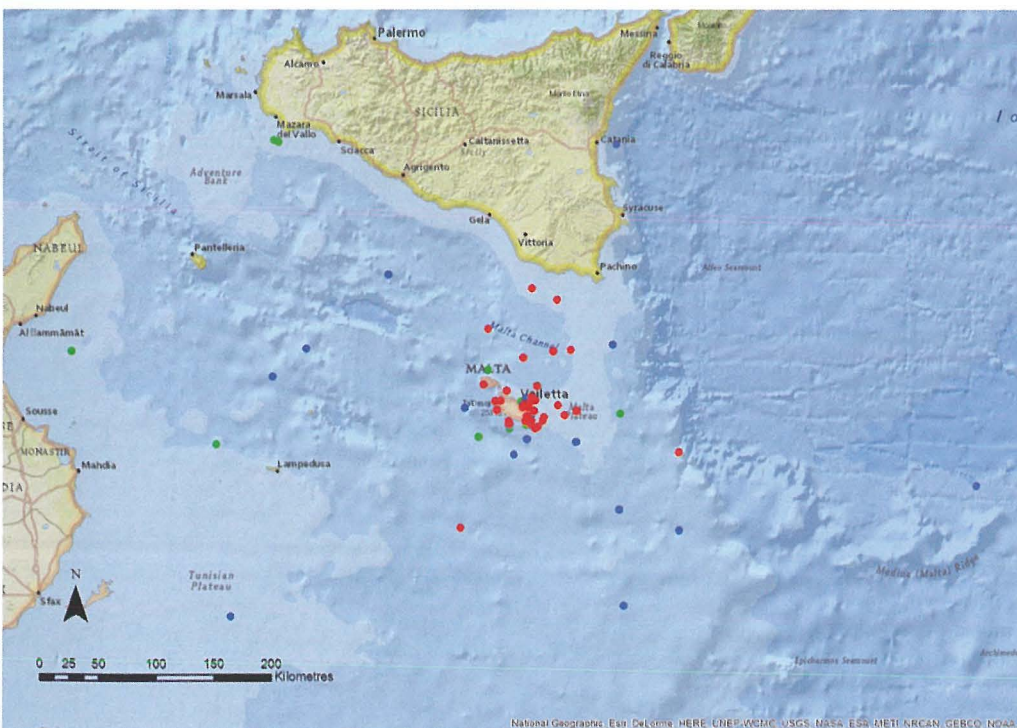


Figure 4. British and Axis bomber crash sites (including Beaufighters). Total numbers for British (shown in blue)=29, Axis (shown in red)=44, and Beaufighters (shown in green)=12.

spatial analysis of the potential Second World War UAA of Malta. While the records of a service whose focus was on ditched aircraft provides an excellent starting point, it is important to stress that this should not be considered a definitive quantification of the UAA heritage, as this would require in depth study of numerous sources in disparate locations currently

beyond the resources of the authors of this paper. One must also exercise caution in posing hypotheses that are too specific for the data in hand, and bear in mind the limitations of primary sources. These include the effective range of the ASR service, the physical and operational constraints under which they worked, and the impact of discrete events such as mechanical failure

and enemy action (Galea 2002). This is an attempt to move beyond the event-focused methodology that has tended to dominate aviation archaeology (Ford 2006), and to examine the record (or at least a section of it) holistically, in order to ascertain broad trends and to show the potential that a more robust and comprehensive survey of the UAA from the Second World War could bring. Due to the paucity of much of the information in hand regarding the actual site of the crashes, of the 444 entries, only 217 had sufficient location data (however approximate) to allow them to be plotted (those graded 1-8) using the Geographic Information System (GIS) ArcGIS 10.1 (Fig. 2), and these coalesced into 12 categories (Table 1).

Statistical Analysis

One of the most noticeable differences is the high number of Allied fighter aircraft reported crashed (220 – 79% of British aircraft) compared to Germany (29 – 27% of German aircraft) and Italy (30 – 58% of Italian aircraft) (Table 2). There are a number of possible explanations for this. The first lies in a higher ratio of Allied fighter aircraft compared to those of other types due to the priority given to gaining control of the air. Secondly, Allied pilots were under orders to cut through the fighter escorts and attack Axis bombers (Canwell and Sutherland 2008, 79; Barnham 2013). Thus the priority of the Allies was to attack Axis bombers, that of the Axis escorts to attack the Allied fighters. Another possibility of course is that the Allied ASR concentrated its efforts upon Allied crashed aircraft. These statistics also provide evidence for the propensity for finding Allied aircraft in Maltese waters as stated above.

There are no significant differences in the relative proportion by function when one compares those within the total amount (444), those plotted (217), or those within 24 nautical miles (232).¹ However, further investigation by function shows that there are variations in percentages of those within 24 nautical miles of Malta. Dive bombers for example have a higher percentage (66%) within 24 nm than fighters (50%) or other bombers (54%). Caution must be exercised, however, as the total number of dive bombers (15) is significantly less than fighters (281) or bombers (110). This percentage (66%) is also distorted in that all *known* locations are within 24 nm; the other five are unknown (including a set of four on the same date), and therefore the percentage within 24 nm could potentially be higher, but not

lower. Dive bombers were especially vulnerable to counterattack immediately after their dive, which was when opposing fighter aircraft tried to attack (Wragg 2003, 158). Additionally, if the target of a dive bomber attack is known, it is possible to anticipate their dive trajectory and interdict them via the use of a ‘box barrage’, as was used in the defence of *HMS Illustrious* in January 1941 (Playfair 1956, 46). With all the above in mind, one can therefore anticipate that a disproportionate amount of dive bombers is likely to be found within Maltese waters compared to aircraft performing other functions.

Spatial Analysis

July 1942 saw the adoption of the policy of ‘forward interception’ (i.e. intercepting Axis aircraft before they reached Malta) (Canwell and Sutherland 2008, 106) and the consequences for the potential archaeological record can clearly be seen when pre- and post-July 1942 Allied fighter aircraft crash sites are compared (Fig. 3).

There is a strong concentration of reported Allied fighter aircraft crash sites around Malta before this date, reflecting how the skies above the islands and their surrounding seas provided the main battleground at this stage of the war. Post-July 1942, there is a marked preponderance in the potential archaeological record of Allied fighter aircraft to the waters north of Malta, right up to Sicily, compared to the same category pre-July 1942. When broken down by type (Hurricane/Spitfire), with one exception, no Hurricanes are reported crashed post-May 1942, no doubt due to their large-scale replacement with the more capable Spitfire from early 1942 (Holland 2003, 194; Canwell and Sutherland 2008, 67). It is therefore likely that any Allied fighter aircraft (or parts thereof) found in the northern section of the Sicilian Channel are Spitfires.

Looking at reported offshore crash sites for British and Axis bombers (including dive, reconnaissance and torpedo variants), one may observe a pattern emerging here as well (Fig. 4). The wide-ranging theatre of operations is reflected in the scattered nature of reported British bomber wrecks. This is further underlined when Beaufighter wrecks are added. Beaufighters were not used to intercept incoming Axis aircraft to Malta (except as night fighters – Canwell and Sutherland 2008, 67) in the same fashion as Hurricanes or Spitfires, but as fighter escorts for bombers on long range strike missions or as strike aircraft themselves (Scutt 2004, 70-74).

Closer examination of the immediate waters

around Malta also shows that 11 of the 16 entries within 4.8 km (3 miles) of Filfla are bombers. As an easily discernible feature in the seascape approximately 10 km west-south-west and south-west of the Fleet Air Arm airfield at Hal Far and the RAF airfield at Luqa respectively, Filfla would have provided a highly visible navigational marker to aircraft returning to these airfields, and indeed was used as the focus for bombers waiting to land at Luqa (Ray Polidano *pers. comm.* 2013). For Axis bombers, it may have acted as a waypoint as they sought to bomb these same airfields.

Conclusions and future work

It is clear from the potential UAA record that the territorial waters of Malta (and beyond) are home to a diverse and plentiful number of crashed military aircraft. The intense Allied and Axis focus on Malta during the Second World War has resulted in a submerged 'catalogue' of military aircraft from both sides during the Siege. As such it constitutes an irreplaceable underwater heritage zone, one worthy of much deeper study than has hitherto been undertaken, and for which the preliminary work and analysis above should be viewed as a marker for what could be achieved with a more comprehensive and robust database. Such a database will include information such as home airfield, planned destination/target, reason for the crash etc., drawing upon a wider number of sources including Axis ASR services, RAF Operations Record Books and oral testimonies. Studied in conjunction with overarching historical data (the full gamut of tangible and intangible sources), these could be used to construct an 'airscape' of Malta during the Second World War in a similar fashion to the way maritime archaeologists use equivalent maritime data to construct 'maritime landscapes' (Westerdahl 1992). Additionally, making this resource available online, as has already occurred with other databases such as the Transatlantic Slave Trade Database (TSTD), would allow independent researchers to interrogate this resource to answer their own hypotheses, whilst acting as a focus for (and an index to) more detail with regard to individual crash sites. It is also the intention of the authors to expand their research in the field of underwater airplane crash sites in waters surrounding the Maltese Islands including those areas of seabed that are over 50 metres deep.

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Anthony Burgess
c/o Department of Classics and Archaeology,
University of Malta
Msida MSD 2080
MALTA
anthony.burgess.13@um.edu.mt

Timmy Gambin
Department of Classics and Archaeology,
University of Malta
Msida MSD 2080
MALTA
timmy.gambin@um.edu.mt

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Anthony BURGESS was awarded an M.A. in Maritime Archaeology from the University of Southampton (UK) in 2013. As part of his degree, he spent six months on Erasmus exchange at the University of Malta in 2013, where aside from conducting the research and fieldwork for the dissertation that provided the material for this article, also took part in the University of Malta's underwater project in Mellieha Bay funded by the Honor Frost Foundation. Before taking up maritime archaeology, he carried out criminal analysis for the UK Home Office.

Timmy GAMBIN is a maritime archaeologist who obtained his doctorate under Dr A. J. Parker at the University of Bristol, UK. He was director of Archaeology of the Aurora Trust before he joined the Department of Classics and Archaeology at the University of Malta as Senior Lecturer in 2012. He has participated and directed numerous exploration surveys in Malta and elsewhere in the Mediterranean, contributing to the discovery of numerous shipwrecks which vary in date from 800 BC to the last world war. Furthermore, he has managed and directed EU projects which covered various aspects of maritime heritage.

Notes

- 1 Article 149 of the United Nations Convention on the Law of the Sea states that: 'All objects of an archaeological and historical nature found in the Area [24 nautical miles] shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin.'

O. F. Gollcher and underwater archaeology

George E. Camilleri

During the last three years of his life Olof Frederick Gollcher (1889-1962) took an interest in the archaeological possibilities of underwater diving. He was anxious to encourage Maltese divers to include an archaeological interest in the pursuit of their hobby. His contact with the Sicilian pioneer, the Marchese Pier Nicola Gargallo, led to the formation of the International Institute of Mediterranean Archaeology and its Malta branch. He coordinated several activities and also provided essential logistic and financial support to the fledgling Maltese underwater archaeological scene.

Olof Frederick Gollcher (1889-1962) is mostly remembered for his home, Norman House in Mdina, containing his extensive and varied collections, and now a Museum known as Palazzo Falson Historic House Museum, managed by Fondazzjoni Patrimonju Malti. In the last two or three years of his life Gollcher played a crucial role in the development of underwater archaeology in Malta (Azzopardi 2005; Azzopardi and Gambin 2012) and in this article I will expand on his role in those formative years. Gollcher, an only child, was educated in Greece and England and served in both World Wars. Whilst in Greece, Corfu and Italy with his parents he took a general interest in archaeology, an interest which persisted after he bought the Norman House in 1927 and later came to live permanently in Malta. This is reflected in the many books and newspaper cuttings on archaeological matters in his archive and extensive library holdings. When in Rome his main interest was painting and he participated actively in artistic circles.

Gollcher, a keen anglophile, was close to the then British Colonial administration and he was a personal friend to Sir Harry Luke, the powerful Lieutenant Governor of Malta from 1930 to 1938. In 1935 he was appointed member of the Antiquities Board set up by the Malta Government and he systematically toured, possibly under Harry

Luke's tutelage, the villages and countryside listing buildings and archaeological sites to be preserved. The OBE awarded in 1937 was directly related to his work on this Board. He remained a member of the Antiquities Board and of the Aesthetics Committee till 1950, and in 1944 was appointed member of the Ancient Monuments Committee to report on the state of ancient monuments including prehistoric, Phoenician and Roman sites damaged by enemy action. He was a friend of David Trump and Capt. Charles Zammit but it might be safe to say that his interest in land archaeology seems to have been more as a constituent part of the general cultural scene rather than any deep interest in archaeology. In August 1958, whilst driving near his country residence, Villa Brunswick in Mġarr, Gollcher noted obvious archaeological remains which were being uncovered by a Government road-widening scheme. He informed the Museum authorities who investigated the area which was definitely Roman, probably a villa (The Times of Malta 1958). He also visited archaeological excavation sites in Italy, such as ancient Stabiae in 1960 and Fulci, north of Rome in 1961. The small collection of archaeological items in Palazzo Falson unfortunately lacks any provenance information and some may have been bought from local antiquarians or obtained directly from excavations in Malta or abroad such as Stabiae.

Underwater archaeology

The story of the early stages of underwater archaeology in Malta has been described in recent publications (Azzopardi 2005; Azzopardi and Gambin 2012) when the primary role of the British Services teams in the late fifties was highlighted. Gollcher's interest was acknowledged without delving into his seminal role in involving Maltese divers in organised underwater archaeology. The first indication of an interest in underwater archaeology by Gollcher is a short entry, 'Sub Aqua', in his diary on 24 March 1959, possibly indicating a visit to a meeting of the Malta Subacqua Club which had been formed in 1955 by Eric Pace Bonello and others (cf. Pace Bonello 2014). It is likely that this interest in underwater archaeology was triggered by an article in *Time* magazine of 9 March 1959 describing Gargallo's underwater activities. Gollcher wrote to *The Times of Malta* suggesting that Maltese divers should dedicate some time to Underwater Archaeology besides spear-fishing (Gollcher 1959a). This provoked an immediate response from a British serviceman, in a personal letter to Gollcher, strongly rebutting this call saying that Maltese divers are only interested in killing all available fish before someone else does, and anyway there is nothing worth diving for from an archaeological viewpoint (P[alazzo]F[alson], O[laf]FG[ollcher]A[rchives], f002/008/01: Larn/Gollcher 1959). Chief P.O.R. Larn RN, HMS Falcon, Kalafrana, stressed that only the Services, especially the Royal Navy, had the necessary divers and equipment. He had made 530 dives around Malta and had kept the World Council of Underwater Archaeology, the World Federation of Underwater Activities and the British Sub Aqua Club informed of his findings. Gollcher was not discouraged by this letter and later that month in April 1959, wrote to the Sicilian Marchese Pier Luigi Gargallo, enclosing a copy of his letter to *The Times of Malta* and requesting photographs for a forthcoming talk he was planning to give (PF, OFGA, f187/007: Gollcher/Gargallo April 1959).

Marchese Gargallo was one of the pioneers of underwater archaeology in the Central Mediterranean (Gargallo 2012). He had set up and ran an Istituto Mediterraneo di Archaeologia Sottomarina (Mediterranean Institute of Underwater Archaeology) in 1955 which had conducted a number of dives in Sicilian waters. At least since 1958 he had the cooperation of British divers in some of his Sicilian

expeditions. In the summer of 1958 he, together with a Royal Navy Diving Team led by George Wookey, of Whiskey Galore fame, and a German team which included Gerhard Kapitän, were diving at Marzamemi, near Syracuse, to investigate giant marble columns on the seabed, which were to lead to a historic find related to Palaeochristian studies (Kapitän 1969).

The Gargallo name must have evoked some childhood memories in Gollcher and in his letter to him he had enquired whether Gargallo's mother was born in Giannina (Ioannina, Greece), in which case he knew her from his childhood. This appears to be the first letter between Gollcher and Gargallo. However, although contact between them had now been established Gollcher was not involved in any way in Gargallo's summer 1959 expeditions in Sicily. The Syracuse 1959 expedition included members of the Cambridge University Underwater Exploration Group led by Nick Flemming now a doyen of Underwater Archaeology (Special Branch of British Subacqua Club 52), Royal Navy divers under Lt George Wookey, and Stephen Keleny, an English solicitor and keen underwater diver, many of whom were Gargallo's guests at Palazzo Gargallo in Syracuse (Fig. 1).

The British Services, especially the Royal Navy, were developing the technology of underwater diving, chiefly for its military potential, but they also indulged in its other possibilities such as spear-fishing and the recovery of items from the seabed including scrap metal and occasional archaeological finds. It was in the latter area that British teams worked with Gargallo in Sicily. This expedition was later featured in a talk at the Institute of Archaeology in London by Margaret Guido, later author of the then best archaeological guide to Sicily (Guido 1967). Unfortunately this expedition was to lead to a number of disagreements between Gargallo and the Cambridge University contingent. It is interesting to note that the Cambridge Underwater University Group which is still active with an excellent website describing their expeditions does not include the 1959 Sicilian one.

Although several letters had been exchanged and Gargallo had also visited Malta in July 1959, when he was Gollcher's house guest, it was only in November 1959 that Gargallo responded to Gollcher's enquiry about his mother (PF, OFGA, 160/007: Gargallo/Gollcher 2 November 1959). The answer was in the affirmative and she remembered him well in Greece to which Gollcher nostalgically responds that 'a sua madre io sono Olly figlio di Elisa e Gustaf che

erano tanti amici' (PF, OFGA, f165/007: Gollcher/Gargallo 1959). This fortuitous connection must have contributed to the future close collaboration between Gollcher and Gargallo. During Gargallo's July visit he was scheduled to give a lecture at the University of Malta. However he was recalled to Rome for urgent business and, at very short notice, the talk was passed on to David Trump, then curator of the Archaeology Section of the Malta National Museum, utilising Gargallo's notes and slides (The Times of Malta 1959). Trump, who had no experience of underwater archaeology, was at a dinner party when the forthcoming lecture was mentioned and to his astonishment found that he was designated to give it (*pers. comm.* D. Trump, 2009).

The presence of British and Italian teams diving together in the Sicilian expedition of September 1959 mooted the idea to the participants, especially to Keleny, to establish an International Institute of Underwater Archaeology. Keleny, seemingly the main instigator, prepared the first draft regulations and came to Malta to meet Gollcher, whom he knew from a social meeting in Malta the previous year. In a letter to Gargallo, Gollcher enthuses on underwater archaeology and supports the idea of the formation of an Institute (PF, OFGA, f175/007: Gollcher/Gargallo 6 November 1959). Although the word International is bandied about it is clear the original intention was a joint British and Italian organisation, which was very much Gollcher's inclination.

Later, Gargallo complained to Gollcher about the behaviour of the Cambridge contingent ("boys"), their withholding of the expedition photographs and their intention to unilaterally publish an expedition report (PF, OFGA, f142/007: Gargallo/Gollcher undated). On the other hand Gargallo was pleased with the RN support especially the use of their diving equipment and in September 1959 he wrote to Gollcher regarding the possibility of "obtaining" this diving equipment for the next expedition. There appears to have been some delay in the return of the RN diving equipment and, possibly as a result of unofficial Royal Navy pressure, both Keleny and Gollcher wrote to Gargallo on the issue. The diving equipment was eventually returned to the Royal Navy in Malta in October 1959. The copies of the 1959 expedition photographs were sent to Gargallo by Jocelyn Toynbee, an archaeologist at Newnham College, Cambridge, together with a promise not to unilaterally publish the expedition report, again



Figure 1. Palazzo Gargallo, Siracusa, Sicily

probably following personal intervention by Gollcher. Keleny now had a dual role to play, primarily to draft the statute for the projected Institute but also to clear the air regarding the discord which had followed the 1959 expedition. A legally vetted draft constitution for the proposed Institute was prepared in London to be discussed at a forthcoming meeting in January 1960 to be held in Malta, according to the British group, and at the Lipari Islands according to Gargallo (with Gargallo always expected to foot the bill). Gargallo made short shrift of this suggestion and made it clear that he would not work with members of the Cambridge University team. Meanwhile Gollcher seems to have realised that the future lay with Gargallo and in October 1959 he published two long articles on underwater archaeology (Gollcher 1959b, c), highlighting Gargallo's work in Sicily.

1960

Whilst drafting the new constitution Keleny had appreciated that everything hinged on an efficient secretary able to co-operate with both factions.



Figure 2. Model anchors made by O.F. Gollcher. (Photograph reproduced courtesy of the Malta Maritime Museum).

Initially it appeared axiomatic that such a person had to be British and several unsuccessful feelers for possible appointees were made in the UK. During his short stay in Malta at the Xara Palace Hotel, suitably close to Norman House, Keleny realised that Gollcher with his military background and knowledge of Italian and English was well suited for such a position. Gargallo approved and Gollcher became – *de facto* – honorary secretary of the proposed Institute. Gollcher revised the suggested statute and resisted the proposal to have the HQ in London. Whilst the British team, spearheaded by Keleny, was still tinkering with the statute, Gargallo pre-empted the situation and the International Institute for Mediterranean Archaeology (IIMA) was officially launched, the deeds signed by Sicilian notaries at Palazzo Gargallo in Syracuse on 5 January 1960 (Sunday Times of Malta 1960). The signatories were Marchese Pier Nicola Gargallo,

Presidente, La Marchesa Emilia Costarelli, Capitano Olaf (*sic*) Frederick Gollcher, scrittore (Segretario), Signorina Evelyn Prebensen, studentessa, and Dott. Francesco Lino (Tesoriere).

The next hurdle to be tackled was to give meaning to the international aspirations and plan the future programme of the Institute. Enquiries were made regarding the control of and regulations on diving expeditions in Greece and Turkey as well as the establishment of contact with related international bodies. Whilst Gargallo's main interest was to organise, under his sole leadership, future expeditions and promote propaganda in the English language press, Gollcher was trying to strengthen the Institute by establishing contact with other international bodies and personnel and to create a permanent diving unit with a suitable boat and equipment.



Figure 3. O.F. Gollcher reconstructing broken pots in his laboratory at his private residence, Norman House in Mdina. (Photograph reproduced courtesy of Fondazzjoni Patrimonju Malti).

In previous expeditions Gargallo had recovered a number of ancient anchors of which he made models and prepared notes. These models and accompanying notes, translated into English by Gollcher, were distributed in 1960 to many science and maritime museums (including the National Museum of Malta, which eventually passed them on to the Malta Maritime Museum, set up in 1992) as an activity of the Institute (Fig. 2). Naturally with Gollcher as secretary it was essential to organise some activities in Malta by establishing a Malta Underwater Archaeology Branch of the IIMA. Commenting on the Malta Branch activities Gollcher writes to Gargallo: 'I had a meeting with Scicluna who is interested in underwater archaeology, and as soon as he finds four or five others I shall ask the Royal Naval Diving School to give them some training' (PF, OFGA f088/007: Gollcher/Gargallo 1960). On 30 January 1960, S. A. Scicluna was appointed leader of the

IIMA, Malta Underwater Section. By this time Keleny, in London, had given up all attempts to maintain a British input and ruefully remarked to Gollcher 'only wish that you had been in charge last summer' (PF, OFGA f021/007: Keleny/Gollcher 1960). Gollcher is now working on two fronts – as general secretary he is trying to plan the Institute's future expeditions in Sicily and Greece although this seems to have been mostly a supportive role as Gargallo still worked in his usual autocratic manner independent of the Institute. Furthermore, Gollcher also strongly supported the fledgling Malta Group in their Malta activities, and in June 1961 a formal deed forming the Malta Underwater Archaeology Branch of IIMA was drawn up and signed with Major J. H. (Sunny) Muscat as President and Mr S.A. Scicluna, Secretary.

Gargallo had loaned his boat "S. Agata" to Sicilian underwater archaeologists working in Motya and



Figure 4. O.F. Gollcher at Xlendi Bay, Gozo. (Photograph reproduced courtesy of Fondazzjoni Patrimonju Malti).

was looking for a bigger boat. Gollcher made several attempts to find a suitable boat in Malta but Gargallo eventually purchased the corvette “Carolina” in Palermo.

In the summer of 1960 a Royal Naval team dived with Gargallo at Marzamemi, but this was more a continuation of the 1959 working arrangements and was not much influenced by the new Institute. Gollcher made contact with Quentin Hughes, later professor of Architecture at the Royal University of Malta, to recruit interested student volunteers to join the Sicilian summer 1960 expedition. Another member of Gargallo’s 1960 team was G. Kapitän, an East German who eventually defected to the west and played an important role in Gargallo’s expeditions. He also imparted some badly needed Teutonic thoroughness to the activities.

Gollcher, who was not a diver himself, saw his role as a facilitator and promoter of underwater archaeology. At that time the National Museum of Malta also catered for archaeological matters and Gollcher, who felt the need for a dedicated organisation, wrote to H.E. The Governor, Sir Guy Grantham, urging the setting up of a Maltese Institute of Archaeology

under the patronage of the Government with the aims of encouraging and cooperating with visiting archaeological expeditions, as well as mounting expeditions in its own right. The Governor found the suggestion valuable and important but was unable to give any financial support. Gollcher stressed that a token support would be instrumental in giving the Government an active interest in the proposed Institute which however never materialised (PE, OFGA f021/007: Gollcher/Grantham 1960).

1961

This was to be his only full working year and the editor of *The Sunday Times of Malta*, George Sammut, writing under the pseudonym ‘Roamer’, undoubtedly prompted by Gollcher, noted that the object of the IIMA was to search for sunken wrecks and their cargoes, to promote visits of foreign teams to work in Malta and to engender collaboration between and a common policy for the various underwater clubs in Malta who were working independently (Roamer 1961). Gollcher

went to Italy on a course for the cleaning and repair of objects found under the sea and on land. Two laboratories were set up, one at Palazzo Gargallo in Syracuse and another at Norman House in Mdina (Fig. 3), where artefacts recovered in Maltese waters were cleaned and handed over to the National Museums in Malta and Gozo.

Gollcher had, with Services support, drawn up the requirements to establish an equipped diving unit. He wrote to many international institutions for funding, without much response. Locally the response was just as bleak and besides providing his boat and using Norman House as a laboratory, he also often helped the various activities financially. Gollcher was often asked by British Services teams to advise and facilitate their expeditions in Italy. He was able to help such expeditions both in his capacity as secretary of the IIMA and through his many personal contacts. These expeditions included one to Sicily from the Royal Navy base HMS Falcon, RNAS Hal Far (Lt. Martins) in 1962, the RAF Maintenance Base Safi (Flt. Lt. P.L. Hills), R.A.F. Malta Sub-Aqua Club (Sqn. Ldr. P. Lithgow) for a possible expedition to Sicily and Sardinia in 1962, the RAF Sub-Aqua Archaeology Group from Germany (Beaton) regarding a possible diving expedition to Sicily, and the Imperial College team (Matthews) to Motya, Sicily in 1962.

The dramatic increase in diving activities including uncontrolled recovery of archaeological items and the proposed setting up of diving schools was a source of worry. Gollcher wrote several times to the relevant authorities as well as in the local papers on the urgent need for legislation to control illicit recovery of underwater archaeological material pointing out that the loss of context of such finds considerably diminished their research value (Gollcher 1961).

Imperial College

Gollcher played an important supportive role in the July 1961 expedition of the Imperial College Submarine Archaeological group, led by John D. Woods. The group consisted of a range of specialists but did not include an archaeologist. Their main aim was to try out the latest technology with emphasis on propulsion, communication and surveying methods in underwater research. At first Gollcher attempted to use the Institute

and his Italian contacts to facilitate their plans to dive somewhere in Italy, Sicily or Turkey but finally it was agreed that they come to Malta. He also suggested that they contact Trump at the National Museum of Malta, who suggested Marsaxlokk as the most promising site. The RAF underwater team was helpful in offering tent accommodation at Hal Far and use of equipment but initial dives at Marsaxlokk proved disappointing from an underwater archaeological viewpoint, although many previously unrecorded biological specimens were recovered and presented to the Natural History Museum (London). In June an RAF team was diving at a promising site in Xlendi which was followed up by an RN team in July. Unfortunately the logistics for the Imperial College team to join them in Gozo whilst still accommodated at Hal Far proved too difficult and time wasting. Gollcher then offered his summer house at Mgarr as a base. This made it feasible to transfer their attention to the Xlendi dive (Fig. 4). They participated in the recovery of archaeological material as well in the drawing up of a detailed survey map, possibly for the first time in an underwater survey, of the Xlendi Bay ridge. The finds were examined by the director of the Archaeological Section of the National Museum and deposited at the then newly opened Gozo Museum. Woods, a physicist who visited and lectured in Malta and Gozo in 2011, was to become a member of the Intergovernmental Panel on Climate Changes which, jointly with Al Gore, was awarded the 2007 Nobel Peace Prize.

Commenting on underwater archaeology, the Museum Annual Report for 1961 reports that: 'Results from this new branch of research continue to accumulate. The Museum's grateful thanks are due to the various diving teams who have helped – HMS Falcon, the Fleet Diving Centre (Manoel Island), the RAF Subaqua Club, the Malta Subaqua Club and Capt. O.F. Gollcher's team (a branch of the International Institute of Mediterranean Archaeology)' (Trump 1961, 6).

1962

The Malta Branch of the Institute was still recovering archaeological items and presenting them to the Museum authorities (Masini 1962) when Gollcher's health began to fail and his last contribution to the papers (Gollcher 1962) was a review of activities of the International Institute of Mediterranean Archaeology. Trump, in a review of underwater archaeology, comments 'no record of acknowledgement, however,

would be complete without mention of the valuable work of co-ordination on all underwater archaeology around Malta carried out by the late Captain O. F. Gollcher, whose help is sorely missed' (Trump 1963).

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George E. Camilleri
Department of Dental Surgery
University of Malta
Msida MSD 3080
MALTA
george.e.camilleri@um.edu.mt

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George E. CAMILLERI, a retired dental surgeon, has lately published mainly on the history of dentistry in Malta and studied the teeth recovered from several Phoenician and Roman tombs in Malta. He is a volunteer at Palazzo Falson with a special interest in the Gollcher Archives.

A Phoenician shipwreck off Gozo, Malta

Timmy Gambin

The Department of Classics and Archaeology of the University of Malta recently undertook a detailed survey of the seventh-century BC shipwreck located in Maltese territorial waters. This survey was organised within the GROPLAN Project financed by the French National Science Foundation. Work was undertaken together with the Centre National de la Recherche Scientifique (CNRS) and the University of Aix-Marseille in close collaboration with the Superintendence of Cultural Heritage, Malta.

This shipwreck was discovered in deep waters and subsequently documented over a number of years by a team of experts from AURORA Trust, Heritage Malta and the Superintendence of Cultural Heritage. However, due to the delicate nature of the site this work was carried out discreetly. Such an approach enabled the gathering of important preliminary data without putting the site at risk. These initial surveys confirmed that the site consisted of a well-preserved Phoenician shipwreck (Fig. 1). Various amphora types, known from local burial contexts of the Phoenician period, allowed Professor J.C. Sourisseau to confirm the date of the vessel as the first quarter of the seventh century BC. Given the potential contribution of such a site to the understanding of trade in the central Mediterranean during the Archaic period it was decided that various options would be explored in order to better study this site.

Early in 2013, an opportunity arose for the University of Malta to participate in a well-funded project that aimed at recording the site using state of the art technologies that would produce a 3D photogrammetric image of the site that will be compiled by Dr Pierre Drap. In order to achieve this, various underwater assets were brought to Malta on board the Minibex – a research vessel owned by the renowned French underwater exploration firm COMEX. Among the various pieces of equipment deployed the most notable were the Remote Operated Vehicle together with the REMORA 2000 – a two-person submarine capable of carrying an array of instruments and sensors.

Three synchronised cameras produced real-time odometry which essentially enables the use of data to estimate changes in the position and location of the vehicle. Software developed especially for this project subsequently processes these images and produces the aforementioned 3D photogrammetric image with an accuracy of under 3 mm (Fig. 2). Such a high-resolution image will then be utilised for future detailed studies of the site. Although data are still being processed initial observations are revealing some very interesting and previously unknown facts about the site. Whereas it was previously believed that the ship was carrying four types of ceramic container (including amphorae and

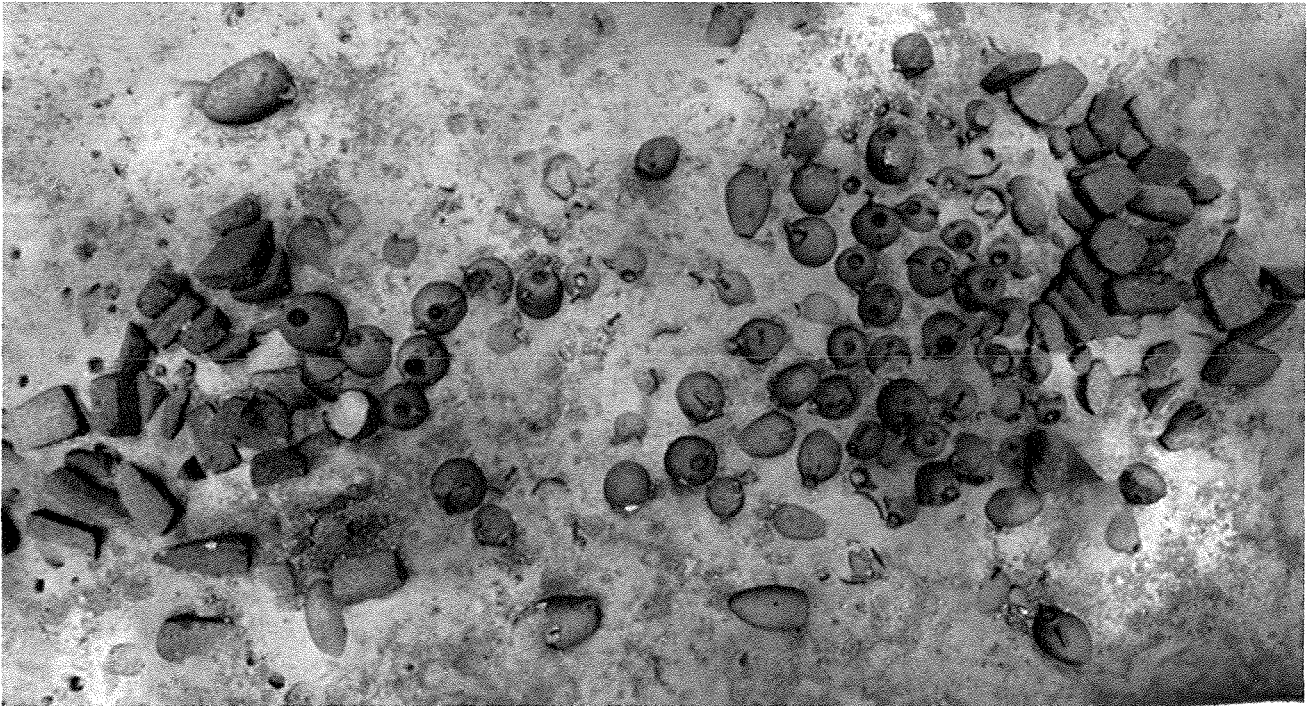


Figure 1. A composite image of the entire shipwreck produced by stitching over 2000 photographs using highly specialised software developed specifically for underwater photogrammetry. (Image: University of Malta/Groplan Project).



Figure 2. An oblique image of the Phoenician shipwreck as seen from the submersible. (Image: University of Malta/Groplan Project).

urns) it has now been established with certainty that there are at least seven typologies present on the site. Besides the cargo of ceramics, the ship was also carrying a significant number of grinding stones. Close study of the area where a number of stone blocks lie confirmed the presence of grinders that correspond to the stones.

Another phase of this year's fieldwork included the lifting of samples of the cargo from the site. Following the completion of the data gathering for the 3D photogrammetric survey a number of objects were selected for recovery. Objects chosen for lifting included one grinding stone and three ceramic containers that were clearly not entirely embedded in the seabed, thus minimising the risk of damaging them during the operation. A special tool developed and used by COMEX on numerous deepwater sites was deployed successfully, with three ceramic objects recovered as well as one grinding stone. Environmental samples were taken from the deposits present inside the ceramic containers. Other objects included pottery fragments, molluscs and concretions. All objects and their contents are currently undergoing desalination at the Archaeology Centre at the University of Malta.

Final results of the fieldwork undertaken in 2014 will provide the platform upon which future works will be planned. Further studies on the site are already being conceptualised in conjunction with all local and foreign partners. Some pertinent questions that are still awaiting answers include, but are not limited to: (1) exactly how far into the

seabed does the shipwreck extend? (2) is there a secondary cargo of smaller ceramic objects buried amongst the amphorae? and (3) are any remains of the ship's structure preserved in the seabed? Given that this site might be one of the oldest shipwrecks in the central Mediterranean these are all valid and extremely important questions that can shed light not just on the Archaic period in Malta but also on the trading patterns of the Phoenicians. The latter is something that is often spoken and written about but is rarely visible in the archaeological record, at least not in such a well-preserved and homogenous manner.

Timmy Gambin
Department of Classics and Archaeology
University of Malta
Msida MSD 2080
MALTA
timmy.gambin@um.edu.mt

Timmy GAMBIN is a maritime archaeologist who obtained his doctorate under Dr A. J. Parker at the University of Bristol, UK. He was director of Archaeology of the Aurora Trust before he joined the Department of Classics and Archaeology at the University of Malta as Senior Lecturer in 2012. He has participated and directed numerous exploration surveys in Malta and elsewhere in the Mediterranean, contributing to the discovery of numerous shipwrecks which vary in date from 800 BC to the last world war. Furthermore, he has managed and directed EU projects which covered various aspects of maritime heritage.

WOODS, J. 2014.
Ix-Xlendi and its Ancient Shipwrecks.
 308 pp., illustrated. Genova:
 Goff Editions (e-book), £64.19

The volume reviewed here is presented as a 'historical detective story' by Prof. John Woods, leader of the Imperial College team that worked in Xlendi Bay in 1961. It is not a novel but a book in which the author tackles what he terms the Xlendi mystery using Braudel's approach. He does so in a manner that aims to be both popular and scholarly and therefore appealing to a wide audience.

It is organised into three main parts, each including four chapters. The first gives an overview of the geographical and historical background. The second is dedicated to a detailed account of the Imperial College team's work and the third is an analysis of the Xlendi mystery. The book is full of informative colour photos from the author's own collection and this documentation of the work his team did in 1961 is a valuable resource.

The main theme of the book is to solve the Xlendi mystery '...by relating maritime activity in the central Mediterranean to the harbour's socio-economic history in the spirit of Braudel's *Longue durée*' (p. 3). The Xlendi mystery is that: '...this concentration of ancient artefacts is far richer than the meagre findings elsewhere in Malta' (p. 3). Furthermore: 'explaining the inter-century fluctuation is the most challenging aspect of the Xlendi mystery' (p. 15). The author crafts a scenario whereby shipping to and from Xlendi was mainly a local enterprise with a high risk of shipwreck when foreign ships were involved. This would have been necessary when there was increased trade in times of historical turbulence.

It is an interesting concept but it could also be argued that the premise of a Xlendi mystery is a false one. I assume, although it is not clear, that the author refers to the scarcity of finds from underwater contexts rather than terrestrial ones. It is true that other marine sites are not well known but this is more a result of geographical constraints and limited archaeological exploration than anything else. Xlendi is a rich site but it is premature to make comparisons with areas that have not yet been properly investigated.

Considering the intended nature of the book, the author correctly states that it is not the right place for a detailed historical background. One of the strong points of more popular works is that one does not

need to get lost in the details but it is essential that they are based on correct information and that there is clear differentiation between fact and opinion. Our knowledge of local archaeology does change with new discoveries but claims that differ markedly from what is currently known should be supported with the evidence or with appropriate references, even in more popular works. For example, assertions that there was both a Punic hill fort and a Phoenician settlement in Xlendi, the latter supposedly based on archaeological evidence (p. 82, 90, figs 48, 49), are incorrect. The overview of the islands' role in the central Mediterranean is in line with that given by Atauz (Atauz 2008), which has been critiqued elsewhere (Gambin 2009). The issue here is that one take on a complex question is presented as historical reality throughout the book. There is also a tendency towards chronological cross-referencing where evidence from much later time periods is used to inform the earlier historical background.

Another issue is the inconsistent use of sources for the archaeological material. The text and the reference list show that recent studies were available and indeed used. Yet information provided in a 1964 report, superseded by the recent studies, is still used in several parts of the book. For example in chapter 8, the author seems to follow the 1964 report which groups a number of amphoras together as cargo from one wreck based on what was known at the time. However in chapter 10 he follows the data in the 2006 study for his statistical analyses. It is possible that it is this that has also led to the incorrect captions for figures 92 and 109.

In Chapter 4, the term 'wreck hunters' is repeatedly used to refer to teams who conducted surveys in Xlendi. This is unfortunate as they were professionals working with the local authorities in trying to build a detailed map of the area on which to base future study.

However, Woods makes a valid point by highlighting the potential of researching the gaps in the Xlendi amphora record. But are they indicative of peaceful periods with less probability of shipwreck? In considering this one must bear two things in mind. The first is that the raised amphorae are merely a sample of what may yet be found and not all have been dated, limiting the scope of any numerical analysis. The second is that there are amphorae, albeit in smaller numbers, that date to time frames that fall into Woods' gaps (Azzopardi 2006). This book is about Xlendi but the evidence from one harbour

alone cannot be taken to be reflective of the islands' trading patterns. It would have been interesting to investigate any gaps against a background of what is known from other local sites. Finally, can one speak of the probability of shipwreck determined by cultural and historical events? Or is it more of an accident of human error and geography? I have often assumed the latter but this is an interesting question that merits further discussion.

This is more than a popular or scholarly account. It is also a personal one, and herein lies its strength. It is fascinating to have such a richly detailed, first-hand account of the ground-breaking work carried out by Woods' team. It is important to know that they pushed the boundaries of what was thought practicable at the time and did so with impressive results. Another strong point of the book is the discussion of oceanography in Chapter 11. This is the subject of Prof. Woods' expertise and it is a much-needed addition that will greatly enrich future study of the Xlendi site.

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Elaine Azzopardi
The Scottish Association of Marine Science
Scottish Marine Institute
Oban, Argyll, PA37 1QA
UNITED KINGDOM
Elaine.Azzopardi@sams.ac.uk

AZZOPARDI, E. & T. GAMBIN 2012.
Archaeology and the Sea in the Maltese Islands.
64 pp., illustrated. Malta:
AURORA Trust and Midsea Books Ltd.
ISBN 978-99932-7-402-5.
€15 (paperback).

Only a handful of works have previously been published specifically tackling the maritime archaeology of the Maltese Islands. Most of the literature deals with the maritime history of the Islands and therefore this new publication comes as an addition to the collection of works dealing with the Maltese maritime heritage. This slender book is an ideal starter for anyone interested in the maritime and underwater archaeology around the archipelago. Written in clear and concise English, the book touches on all the basic aspects related to the archipelago's submerged cultural heritage, with the aim of creating an interest in this aspect of Malta's heritage. The text is legible and illustrated with high-resolution coloured images. A reading list has been added at the end of the book. The preface states that the book was compiled for a general audience.

The book is divided into five short chapters, each covering a different aspect of the maritime influence on the Islands. In a general introductory chapter, the authors discuss different perceptions and interactions that have taken place between people and the sea. Some of the information comes from accounts describing ancient voyages, but a substantial amount of material still lies at the bottom of the seabed, yet to be explored. Texts very often go hand in hand with the material remains, however as noted, archaeologists have to be careful when trying to understand accounts written by ancient historians. That is why so much attention should be given to the newly discovered sites, as these can enlighten us with further knowledge regarding ship construction, technology, trade links, commodities, and other data. The chapter also touches on harbours and anchorages as 'gateways between land and sea' (p. 5), however the sea was often seen as a barrier rather than a connecting medium, and in order to study a site it is essential to look at it from all viewpoints, as a maritime landscape. Apart from having a material and commercial nature, there are also supernatural and religious elements involved. The reconstruction of a religious maritime landscape is harder to grasp. Nevertheless, there is material evidence to establish that such sites did exist, for example temples, shrines

or statues found on promontories or headlands, which had both a functional and a sacred purpose. A special page is dedicated to the history of diving, how this has developed into what we know as SCUBA (Self Contained Underwater Breathing Apparatus) and the possibilities it has brought to exploring the underwater world.

The second chapter delves into the different methods developed and applied when studying maritime and underwater archaeology. Some of these techniques have been utilised around our shoreline in order to locate and record any archaeological material. The first section describes how a site is located: the initial desk-based research and the application of remote sensing technology to survey the underwater seabed and map out anomalies. Two pages are dedicated to describing how each piece of equipment works, which include side scan sonar, sub bottom profiler, magnetometer and remote operating vehicle (ROV), each using a distinct physical property, resulting in different outcomes. Excavating a site is one option. Alternatively, what UNESCO (Convention on the Protection of Underwater Cultural Heritage, 2001) put forth is preservation in situ. If the former technique is carried out, then certain challenges of working in an alien environment have to be overcome. In spite of this, the same rules of stratigraphy very often apply. The chapter concludes with a number of illustrations showing some of the artefacts that were recovered from Dockyard Creek. The post-processing phase of an excavation takes a substantial amount of time, as artefacts need to be treated by specialist conservators, catalogued and photographed.

The following two chapters focus on the Maltese Islands, their maritime history and the underwater archaeological works carried out during the 1960s to the present. The Islands' location in the central Mediterranean appealed to many abroad, creating a constant flow of foreign presences throughout its history.

One chapter runs through the history of foreign occupations, dating back to prehistory until the succession of the Knights of St John in 1530 and the British Royal Navy in the 1800s. These two periods marked an increase in maritime services and structures, peaking in World War II when the Islands acted as a safe haven for the Royal Navy and its allies. Malta still benefits from this maritime activity, as it still provides several services to both locals and foreigners alike. Similarly, the following chapter goes through

the main highlights of exploratory works conducted around the local coastline. The active years began in the 1960s, aided by the invention of the SCUBA equipment. Several teams and federations conducted underwater projects that involved the exploration of potential sites. Some of the projects were futile, whilst others produced some extraordinary material. It is interesting to note that it was not before the 1990s that a local archaeologist was trained in the techniques and practices of underwater archaeology (p. 30). Further collaborations with departments abroad have taken place, such as DRASSM (The French Département de recherche archéologique subaquatique et sous-marines) and INA (Institute of Nautical Archaeology). Through these collaborations, several of the potential maritime sites have been surveyed and explored. The data collected is being catalogued to create a database of underwater sites, which hopefully will be made accessible to anyone who wishes to view it. The concluding pages of this chapter describe one particular project conducted by Aurora Trust and the Superintendence of Cultural Heritage. This long-term project resulted in the surveying and recording of some 350 square kilometres of coastline in various regions of the Mediterranean. Along with this data collection, educational visits to different audiences were organized in order to raise public awareness.

The concluding section illustrates a selection of finds from Malta, including amphorae, statues, pipes, anchors, cannons, sounding weights and four World War I and II wrecks, including that of an aircraft. As a final note, the authors have given us an insight into the latest project being undertaken, that of reconstructing the submerged landscape. I look forward to viewing the published results.

Stephanie Said
University of Southern Denmark,
Niels Bohrs Vej 9 – 10,
DK-6700 Esbjerg,
DENMARK
stephysaid@hotmail.com

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De Soldanis: An eighteenth century intellectual. 144 pp., illustrated. Malta:

Heritage Malta and the Ministry for Gozo.

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Although *De Soldanis* (1712-1770) is well known among students of Maltese history, particularly those interested in Gozo, a number of events and publications coinciding with the commemoration of his 300th birth anniversary have brought about new revelations and have led to further appreciation of the contributions made by this scholar.

De Soldanis: An eighteenth century intellectual, edited by Godwin Vella and Olvin Vella, is one such publication containing a collection of academic essays presented in an attractive format and superbly illustrated by the photography of Daniel Cilia. Two articles will be of particular interest to readers of the *Malta Archaeological Review*. In this book, George Azzopardi, Gozo Curator for Heritage Malta, focuses on the legacy of the antiquarian activity of *De Soldanis* and uses his manuscripts and publications to throw light on the archaeology of the Maltese Islands. Azzopardi divides his article into four sections. After a short introduction, he focuses on places and monuments of archaeological interest, listing Ggantija, dolmen-like structures as well as remains at Xewkija and Ta' Xaqqufiet. The following section deals with burial and funerary monuments mostly in the Rabat area, describing ancient burials as well as the medieval remains that existed in the area of what is now St Augustine Square in Rabat (Gozo). Statuary, inscriptions, and coins are described in a third section which concentrates on *objets d'art* of artistic and historical importance while the final 'concluding remarks' are essentially miscellaneous details not easily placed in the previous three sections.

Azzopardi's article is noteworthy for a number of proposals that are elaborated in his work. A tower-like structure near a cistern at Ta' Xaqqufiet is compared with Roman farmsteads and the 'round towers' of Malta. This is a plausible modern interpretation of what are essentially still elusive remains. The discovery of a white alabaster statue representing Flora in an underground cave at Żebbug (Gozo) is interestingly interpreted as a cultic shrine of the Roman goddess of flowering plants. Furthermore, in the coins with a helmeted head in profile on one side and a standing battling figure on the other,

Azzopardi proposes an 'assimilation of two deities' namely those of Astarte and Juno. In the endnotes, Azzopardi hints at further elaboration of this theme in a forthcoming article.

Anyone conversant with the literature on the antiquarian authors is undoubtedly aware that claims made by them on the provenance and dating of finds has to be treated with caution (see Bonanno 1982: 190-204; Freller 2004: 85-88). Thus, Azzopardi's often uncritical acceptance of the facts presented by *De Soldanis* emerges as a major limitation in his work and his conclusions. Nonetheless, the rediscovery of the Brochtorff Stone Circle at Xagħra (Gozo) through a reassessment of antiquarian drawings, prints and accounts (Attard Tabone 1999: 169-81) reveals that the claims of antiquarian authors should not be dismissed outright. Viewed in this light, Azzopardi's article formulates a number of interesting hypotheses which should revive interest in lost sites. Only on their rediscovery and reassessment can the assertions made by Azzopardi be verified or discarded.

The other article of interest for archaeology is written by Godwin Vella. This author has in the past focused on the stretch of land between Rabat and Ghajnsielem and noted how many of Gozo's prehistoric sites are concentrated in or around this area (Vella 1995). In an article which studies in detail the map by Friar Aloysius Bartolo included in a manuscript by *De Soldanis*, Vella elaborates further on this hypothesis and referring once again to this 'prized agricultural region' notes how this attracted a 'marked concentration of settlements' in a later period (p. 31), showing how landscape has determined human activity in this area.

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Anton Bugeja
42, "Tbissima"
Triq is-Salib
Siggiewi SGW 3301
MALTA
antonbugeja@hotmail.com

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*The Observing Eye: The French Artist
Jean Hoüel in Malta.*

179 pp., illustrated. Malta: Midsea Books Ltd.
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What is the point of reading another book on the artist Jean Hoüel when an electronic copy of the original text (BNF Houel 2013) and images of the original gouaches by the artist (Digital collection results 2013) are freely available on the internet? Considering Freller's expertise on travellers' accounts on the Maltese Islands, it is what is said *on* rather than *by* Jean Hoüel that makes such reading promising. Already in the introduction to the publication under review, Freller commences by giving a list of travellers and artists to Malta, as well as exploring how discoveries of ancient cities, the interests of rich collectors and scholarly publications brought about travel to Italy and subsequently Malta in what is generally referred to as the Grand Tour (pp. vii-xiv). This provides a background to chapter 1 which includes a short and interesting biography of the artist while the following chapter outlines the events leading to Hoüel's second visit to Malta. The narrative on foreign academics and travellers, their publications and interest in the works of Maltese scholars as given in chapter 2 provides a good overview on important developments occurring in the second half of the eighteenth century. In view of the information contained, anyone researching this period for the history of Maltese archaeology should at least consult this chapter. Chapter 3 gives a running commentary on Hoüel's account of his tour to the Maltese Islands with frequent quotes from writings of other contemporary travellers. Here Hoüel's drawings are also contrasted with other contemporary *vedute* paintings which mainly focused on the Grand Harbour. The following short chapter reveals how Hoüel's work was generally received favourably. An equally short chapter follows, highlighting the artist's contacts with members of the freemasonry.

A considerable part of the book is taken by a translation of Hoüel's account of his voyage to the Maltese Islands. This is the first time that the whole account is available to the English-speaking public, with a similar publication issued by Wirt Ghawdex long out of print and only limited to the account concerning Gozo. Considering the cost and size of Hoüel's original publication, it is my impression that locally it has been Hoüel's engravings that have

been commented upon rather than the text. Freller's translation should go a long way to readdress this and it is now immediately clear that Hoüel refers to the ruins of Hagar Qim as 'Agiardkim' (p. 114) and not solely as 'Tadarnadur-Isrira' as appears with the relevant engraving (Pl. 260), the latter term sounding more as a misspelling of Mnajdra or as Ganado (2006, 177 fn. 17) put it, a 'corrupt transcription of *nadar izorric*'. Likewise plate 255 of ruins of the Temple of Hercules at Marsaxlokk refers to the archaeological site of Tas-Silġ as these are described in the text as being near the chapel of Our Lady of the Snow.

Nonetheless it is a pity that Freller's translation has a number of shortcomings and we will need to continue referring to the original for some time. References to the plates in the original headings by Hoüel have been omitted, making cross reference of text and illustrations difficult, especially when the illustrations have now been grouped towards the end of Freller's publication. References in the text to plates are through Arabic numerals but those accompanying the plates are still in Roman numerals, introducing a further difficulty only partly resolved by the list of plates on page 174. Furthermore, in reducing the size of the engravings nothing has been done to make legible the lettering on the original and references to these letters in the main text can only be pursued with difficulty in the publication.

The translation is generously accompanied by informative footnotes. Most concern traveller and scholarly accounts contemporary with that of Jean Hoüel, but reference is also made to some modern publications. It is clear, however, that Freller does not take into account recent relevant material in the archaeological literature. Indeed, no mention is made of articles highlighting the linear features appearing in Hoüel's illustration of the Xaghra Brochtorff Stone circle (Le Chevretel 2008, 47) or the recent proposal of a possible 'early Bronze Age cremation burial mound' associated with the circle depicted by Hoüel near Ġgantija (Azzopardi 2001, pl. 1). Likewise no reference is made to the fact that proposals have been made that the lower figure on page 69 represents a view of Borġ in-Nadur rather than the Xaghra Stone Circle (Bugeja 2011, 21-24). Nonetheless, Freller himself had proposed that his work is only a 'general survey' (p. viii) which despite its shortcomings emerges as essential in appreciating Hoüel's visit and contribution to the history of the Maltese Islands

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Anton Bugeja
42, "Tbissima"
Triq is-Salib,
Siggiewi SGW 3301
MALTA
antonbugeja@hotmail.com

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*Richard Ellis: The Photography Collection,
Malta & Gozo (Vol. IV)*

x+245 pp., illustrated. Malta: BDL Publishing.
ISBN: 978-99957-33-29-2. €80

The prolific career of professional photographer Richard Ellis coincided with the popularisation of photography in Malta during the period spanning the late nineteenth century to the first quarter of the twentieth century. The combination of large format photographs with crisp sharp detail makes his collection an outstanding pictorial resource for historical research.

This review will focus on two chapters in volume IV of a series that is attempting to print the vast archives of photographs produced by Ellis. One is by Katya Stroud, Curator of the Prehistoric Sites Department (Heritage Malta), the other by Joseph M. Attard Tabone. Stroud writes a study on Ellis photography related to archaeology. She provides a well articulated scholarly account which deliberately aims to be easily

understood by the general public. In it she manages to bring together a good number of Ellis's photographs related to archaeology, supplementing damaged negatives with photographs in the archives at the National Museum of Archaeology, Valletta (p. 4). The editorial decision to print each photo in a large format followed by a description of each photograph (pp 5-41) enhances the scholarly value of the work.

She provides a historical background to the photographed sites and discusses the subject with reference to travellers and previous methods of site illustration. Interestingly, Stroud views this centennial touring and illustration of Maltese archaeological sites as activities that capture 'memories and experiences' (p. 1). By noting persons peeping to see Queen Mary entering the hypogeum in 1912 or serving as human scales to megalithic backdrops, Stroud reveals an interest in the interaction of people with archaeological sites (p. 3). She emphasises the difficulty of carrying equipment to outdoor sites and the problematic lighting in indoor photography (p. 2). Such emphases give away Stroud's admiration for the photographer and her intention to enhance the value of the work undertaken by Ellis.

The undated photographic material by Ellis presents a special challenge to Stroud. She meticulously studies the photos to draw conclusions. For her the appearance of the same persons in the photographs of Ħaġar Qim and Mnajdra suggests that these photos were taken on a single day (p. 2). With a Master's thesis detailing the conservation of Ħaġar Qim and Mnajdra, Stroud is conversant with changes occurring within these temples and uses this information to date the photographs at these sites to just before the excavations of 1885. This is probably correct as two photographs of Ħaġar Qim and one of Mnajdra by Ellis feature in a souvenir book commemorating the Colonial and Indian exhibition of 1886, of which the author seems to be unaware (*Souvenir de Malte*, n.d.)

The souvenir book suggests that Ellis was probably commissioned by government to take these photographs, a fact that is clearly attested on later occasions (Bugeja 2011, 23). May I add that Stroud's suggestion that travellers created a market for Ellis's photographs (p. 2) is supported by Mayr's (1901, 725) claim to have purchased the photographs for his book from Ellis in Valletta. In view of this evidence, the possibility that a group of photographs of Gozo were by Fr Emmanuel Magri (Bugeja 2009, pls 2-3) now appears unlikely. It is more plausible that these were

photographs taken by Ellis and ‘supplied by’ Magri to government (Bugeja 2009, 37). Stroud’s verbal confirmation that she saw the plates of photographs in the Ellis archive further support the latter hypothesis.

In his article focusing on Gozo, Joseph M. Attard Tabone presents some interesting issues for historical research related to local archaeology. Amongst other things he points out the existence of watercolours of archaeological subjects by Salvatore Busutil at the Accademia di San Luca, Rome, and hints that Smyth’s lithographs for the 1829 edition of *Archaeologia* are based on the clearances of Ġgantija of 1820. He also gives a historical background to visits made to Ġgantija by Mazzara in 1827, della Marmora and Queen Adelaide in 1839. His proposal that the Brochtorff pencil drawings of Ġgantija and the nearby Stone Circle were made soon after the clearances of the 1820s, only to be later executed in watercolour for the Duke of Buckingham, is remarkable and this hypothesis deserves further research.

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Anton Bugeja
42, “Tbissima”
Triq is-Salib,
Siggiewi SGW 3301
MALTA
antonbugeja@hotmail.com

ELLUL-MICALLEF, R. 2013.

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Sir Themistocles Zammit’s personality looms so large in the Maltese cultural landscape that few members of the Maltese community are unaware of his contribution to Maltese literature and wellbeing. Fewer still might be unaware of his contribution to Maltese archaeology. It is, therefore, not surprising that a substantial section of this biography of Zammit would be dedicated to this field. In fact, one section, of no less than 140 pages of volume two of this biography, is titled ‘Digging up the Past’. It is spread over four chapters (Chapters 19-22) but further information crops up in various other pages of the two volumes. This review deals only with this aspect of the biography and limits itself to the salient points of each of these chapters.

Chapter 19, titled ‘The Development of Archaeology as a Scientific Discipline’ extends its scope to the beginnings of this discipline in other parts of the world – the earliest searches for ancient art treasures in Pompeii in the eighteenth century and the contribution of geology and anthropology in the nineteenth century towards the awareness of the real age of the earth and of man – as well as to the developments in the study of antiquity in Malta, from the contribution of Gian Francesco Abela in the seventeenth century to Zammit’s immediate predecessors, like Cesare Vassallo and Antonio Annetto Caruana.

Even from this chapter alone the encyclopaedic nature of the whole biography comes to the fore. One can claim that there is probably not one single person who had a connection, even a remote one, with Malta – in this case relating to archaeology – that escaped the attention of the author who provides the reader with necessary biographical information and the specific connection with Malta in this or other fields. This means that, from now on, it is indispensable for any researcher conducting searches on any person suspected of a connection with Malta, especially for the period covering the nineteenth century and the first half of the twentieth century, to consult this work. Such a task is greatly facilitated by an index of close to a thousand personal names.

Temi Zammit was not only a scholar and an academic: he involved himself deeply in the promotion, among the people of his country, of awareness and appreciation of their archaeological heritage, as well as in the setting up of the necessary legislative and museological infrastructures for this to happen. These two aspects of Zammit's career in archaeology are treated in Chapter 20: 'Fostering an interest in Archaeology'.

Together with Manwel Magri and other colleagues and government officials, Zammit saw to the enactment of a law to safeguard the country's archaeological heritage against the destruction, often at the hands of vandals, that was taking place before everybody's eyes. Zammit's contribution to the setting up and the strengthening of the National Museum of Malta, of which he was curator (and eventually director) for almost 30 years, was acknowledged by high-standing personalities and scholars in this field, like Thomas Ashby, Director of the British School at Rome, and John Evans who wrote extensively on Maltese prehistory several decades after Zammit's death.

The title of Chapter 21, 'Of Temples, Tombs and Tracks', is self-explanatory. It focuses on Zammit's activities at the archaeological coalface for which he was responsible as Director of the Museum Department and as curator of the archaeological section: mostly investigating rock-cut tombs that came to light quite frequently during trench cutting and laying of foundations, but also full-scale excavations of prehistoric sites, like the continuation of the excavation of the Hal Saflieni Hypogeum after the sudden and unexpected demise of Manwel Magri in 1907. From 1908 he embarked on close collaboration with the British School at Rome, mainly with its director Dr Thomas Ashby, and with his assistant Thomas Eric Peet, and together with them conducted archaeological investigations on a number of prehistoric sites, such as Haġar Qim, Mnajdra, Kordin, Bahrija, and Santa Verna. But the most important "monument" (as he himself called it) in Zammit's archaeological career was the megalithic temple complex of Hal Tarxien. A four-page account provides us with the details of this discovery which placed Temi Zammit and Malta in the international arena.

Let us not forget that it was here that Zammit was in a position to distinguish for the first time between two different periods of Maltese prehistory:

the Late Neolithic during which the temples were built and were in use, and the Bronze Age which came to light for the first time as a substantial ash layer full of ceramic vessels containing cremated human remains deposited in rows next to each other and on top of each other – in other words, a fully-fledged cremation cemetery. The presence of metal items in the same layer was another first.

Zammit involved himself also in the controversy provoked by human molars found inside Għar Dalam and claimed to belong to Neanderthal man, as well as in the other controversial issue of the cart tracks engraved on the natural rock surface in so many areas of the Maltese islands. These are treated most clearly and objectively by the biographer in the same chapter.

The last chapter follows Temi Zammit's career from 1920 to his death in 1935, highlighting more explorations on prehistoric sites, as well as on sites of Classical and post-Classical times. It appears that Zammit had his greatest disappointment in the latter area, that is, when he extended his interest to Roman sites, mainly the extensive grounds to the north of the Roman *domus* where he did not find what he expected, that is, 'floors decorated with beautiful mosaics, fragments of inscriptions, statues and architectural decorations', like those that Antonio Annetto Caruana had found in 1881. He does not seem to have realized how important the Arab cemetery was that he dug through in the thick deposit above the Roman remains on the same site. These were, and still are, one of the rarest finds of this type of archaeological features of the Arab period.

Zammit is still admired for his correct method (by the standards of his time) with which he conducted his excavations of the Tarxien temples; but we somehow cannot say the same for the method he adopted for his excavations on Roman sites. On page 279 we find a comment that Zammit disposed of whole cart loads of pottery from his excavation behind the Roman *domus*, 'after a careful examination'. Needless to say, this bad practice is no longer with us, and one would have expected better of Zammit. He clearly did not possess sufficient knowledge and experience to judge the value of all that pottery and the contexts in which it was found; but he did not even have the foresight that a time would come when experts in that specialized field of research would have been able to do so. Another good practice that he does

not seem to have followed here is the stratigraphic method he followed successfully at Ħal Tarxien. It is quite possible that the stratigraphy on these sites was too complex and Zammit did not have the professional preparation and experience that archaeologists have today in order to follow its sequence and, even more importantly, to keep a complete documentation of it for the benefit of other scholars. Considered by today's standards, the excavation of such a large and so important stretch of land is very disappointing, as is the investigation of the Roman villa of Ramla Bay in Gozo and that of the Roman villa of Ta' Kaċċatura, near Birżebbuġa. It seems that the experience of the British archaeologists, like Thomas Ashby, was not very helpful on these two sites.

The limitations on the length of this review prevent me from tackling other aspects of archaeological

interest. I shall only add a brief judgement. There is no doubt that this is Roger Ellul-Micallef's "*opus magnum*", an impressive work in size as well as substance. The author has done his very best to avoid leaving any gaps in the lively portrait he has painted of this extraordinary personage, a worthy son of his country and deservedly respected as the father of Maltese archaeology.

Anthony Bonanno
Department of Classics and Archaeology
University of Malta
Msida MSD 2080
MALTA
anthony.bonanno@um.edu.mt

NOTES FOR CONTRIBUTORS

The editorial board of the *Malta Archaeological Review* is ready to consider topics on areas of the Mediterranean of direct relevance to the archaeology of the Maltese Islands. Submissions are invited in the following categories: Research articles (max. 4000 words) and Reports (max 10000 words), Notes & News (max. 1000 words), and Reviews (max. 1000 words). Word limits include all text, tables, references, acknowledgements, and figure captions. Articles and Reports must reach the editor at the latest by 1 March each year. Notes & News and Reviews may be submitted later, with the agreement of the editor.

Intending contributors should consult the editor, Nicholas Vella nicholas.vella@um.edu.mt, in advance of submission of material for publication in the *Malta Archaeological Review*.

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