

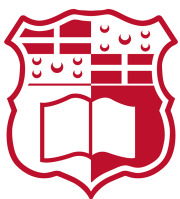


**Between East and West –
The Phoenician Shipwreck off Gozo**

Season Report

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Supporting Maritime
Archaeology in the
Eastern Mediterranean

Preamble

Research on the Phoenician shipwreck has been ongoing since 2007. It started with the discovery of the site during a systematic side-scan sonar survey of the approaches to Xlendi Bay in Gozo. This survey is part of a long-term broader research project aimed at creating a comprehensive archaeological map of the seabed off the islands of Malta and Gozo. Such a map will contribute to a more strategic approach to the management and protection of Malta's underwater cultural heritage.

Site Location & Description

Located approximately 900 meters off the south-west coast of Gozo at a depth of 110 meters, the shipwreck lies on a relatively flat seabed of coarse sand. The visible part of the site rises no more than one meter off the seabed. Except for some minor damage caused by traditional bottom-fishing techniques practiced in the past the site is very well preserved and retains a distinguishable outline. The dimensions of the shipwreck are 12 meters long, by 5 meters wide, with a depth of 1.8 meters of archaeology buried under the sediments. The latter dimension was acquired during a sub-bottom profiler survey. In 2014, a Franco-Maltese team worked on the site using state-of-the-art technologies. The results of this project were the creation of a high-resolution 3D image of the shipwreck and the recovery of four objects. Since 2016, an international team of technical divers, led by the present author, has continued to conduct scientific research on the site.

Past Work on the Site

2007-2010: Various remote sensing surveys undertaken by high-resolution side-scan sonar, sub-bottom profiler and remotely operated vehicle.

2014: Site survey and object recovery through the use of a manned submersible.

2016-present: Site survey and object recovery by diving archaeologists.

Aims of the 2017 Project

The aims of the 2017 project were:

- 1) To test tools and technologies for underwater archaeology at depth.
- 2) To recover a small number of intact artefacts identified as important for the understanding of the site.
- 3) To recover ceramic fragments present on the site.
- 4) To conduct post-excavation studies in order to better understand site formation processes, identify the origin and contents of ceramic objects.

In order to achieve these aims it was essential that dive time was maximised. A one-tonne mooring block was sourced and rigged for mooring purposes. A workboat transported the block and placed it as close to the site as practical. When the block was on the seabed a team of divers used lifting bags to re-position the block in the exact required position. Once in place, the team proceeded to attached a mooring line using chain and shackles. This permitted the master of the dive boat to secure the vessel over the site in the quickest and safest possible manner. The presence of this line ensured that divers were descending straight to the wreck and they could thus exploit the minimal time they had on the shipwreck (see **Figure 1**). Moreover, with the vessel sitting almost directly over the wreck any miscellaneous gear such as the lifting basket could be lowered directly to the site.



Figure 1. Divers working on the recovery of objects from the shipwreck. The mooring block can be seen on the right

Fieldwork Procedures and Methods

The overall aims of the project were clearly disseminated in a long and detailed meeting before the commencement of the project. All members of the team were present for this meeting. Furthermore, every morning before the dive, the project director would brief all divers and support personnel on the day's aims. This briefing was immediately followed by another, this time by the dive safety officer. These meetings would cover various information regarding the aims for the day's dives, logistics and safety, succeeded by any questions or queries that team members may

have had. Due to the depth of the site, traditional underwater methodologies and techniques, such as the manual recording of the site, cannot be employed. This because of the very limited time divers have on the seabed. It was therefore deemed necessary to use a variety of experimental techniques and tools, some of which have been developed by individual members of this team. Since the high-resolution survey of 2014, all objects have been numbered/labelled digitally (see **Figure 2**). All objects on the site are geo-referenced, thus obviating the need for a traditional grid recording system and the physical labelling of objects *in situ*.



Figure 2. A detail of the digital labelling used on the site.

Examples of specific techniques employed included a custom-built stainless rod with several holes at the bottom and connected to an 18 litre cylinder. When activated, compressed air is released in the sediments. In turn, this loosens the suction from around the object, facilitating the extraction and recovery of the item. This rod was used alongside more traditional methodologies, such as hand fanning — a technique that we used for the removal of surface sediments. Other traditional site documentation methods, such as the use of offset measurements, have not been used. This is primarily due to the heavily restricted time that the divers have on the seabed.

However, given the necessity of documentation in any given archaeological project, an alternative and less time-consuming method had to be utilised. Therefore, one of the main fieldwork methods used in the Phoenician Shipwreck Project was photogrammetric surveying which took place after any intrusive work was executed on site. In order to acquire data for the 3D model, three divers would work in unison to film the entire site in High Definition (See **Figure 3**). Once back on the surface, processing would commence with the extraction of still photographs from the HD video footage. This approach has two advantages: 1) it facilitates 100% coverage of the site and 2) the HD video footage forms an integral part of the project documentation.



Figure 3. Divers acquiring data for the 3D photogrammetric model.

Following their extraction, the photographs are then processed in Photoscan Pro — a powerful software suite used specifically for the production of 3D photogrammetric models (see **Figure 4**). In turn the photogrammetric model is used to produce models that also integrate 3D scans of recovered objects as well as images that are closer to traditional archaeological recording methods. To date, this process is still being perfected.



Figure 4. A detailed photomosaic of the site.

Diving Appraisal

Due to the extreme depth of the shipwreck, dives are physically and mentally taxing and require divers to be not only experienced but also highly disciplined. Such highly specialised diving limits the number of people that can participate in the project. All feasible safety precautions were carried out in order to ensure diver safety. Such measures included the presence of hyperbaric doctors onboard the dive vessel, a fast RIB was placed on standby (just in case it was needed for emergency evacuations) and a series of back-up cylinders were carried by divers in case their rebreathers failed. Furthermore, the project dive protocol covered emergency procedures for a variety of situations. A number of pre-project meetings were also held with staff members from the hyperbaric chambers of Gozo and Malta. Besides being made aware of our operations and dive profiles, they were also on standby for any emergency that may have occurred.

Project Outcomes

The 2017 season may be considered as highly successful. This statement is based on the fact that the main objectives were reached and can be gauged through the following achievements:

- 1) The mooring block was placed successfully and will be available for subsequent seasons.
- 2) Six whole ceramic objects were recovered (See **Figure 5**) as well as many fragments of others. The latter have been studied and it is clear that they form part of at least another two objects.
- 3) 3D photogrammetric models were produced after every recovery.
- 4) A public talk organised by the Munxar Local Council was delivered in Xlendi square. This event was well attended and enabled the team to share its work with the local community as the project was ongoing.
- 5) Objects from this expedition will form part of an exhibition that will be organised in February and March 2018 at the Maritime Museum, Malta and the Ministry for Gozo, Victoria.
- 6) Meetings have already been held with Heritage Malta on the inclusion of artefacts from the shipwreck in the display of the new museum of Gozo.
- 7) Various samples, including ceramics for thin sections, environmental for pollen as well as ceramics for lipid analysis, are currently being processed and analysed.



Figure 5. Three unique pieces prepared for recovery from the seabed.

Concluding Remarks & Aims for 2018 Season

When assessing the project, it is imperative to keep in mind that no manual exists for manually executing archaeological work at such depths and the approaches used and described are a hybrid of established practices and experimental ones. However, this does not mean that the scientific approach may/should be compromised in any way. The combination of factors (i.e. the depth, the lack of an established methodology for working at such depths, and the archeological frameworks within which one has to operate within) means that the rate of progress is necessarily slow. This is especially true when one compares this work to more ‘traditional’ underwater excavation (which is not a fast procedure anyway). However, through the experience garnered over the past two seasons and with the introduction of a purpose-built air lift that will be operated at depth it is envisaged that future work on the site, including the excavation of a test trench (see **Figure 6**), will be expedited.



Figure 6. Site for test trench being proposed for 2018 season.

Appendix A
Collaborative Institutions

University of Malta
Heritage Malta
Universitaire Aix Marseille
CNRS - Marseille
IMBE - Aix en Provence

Appendix B
Project Team

Technical Divers

T. Gambin (Malta)
D. Gration (UK)
K. Hyttinen (Finland)
I. Wallin (Finland)
J. Wood (Malta)
A. Castiilo (Malta)
G. Iaria (Italy)
J. Herbowicz (Poland)

Medics & Shallow Diver Support

Dr C. Azzopardi
Dr S. Muscat
Dr L. Matic

Boatmen

K. Fenech
M. Mumford
S. Bartolo

Archaeology and 3D (on land)

J. C. Sourrisseau
P. Drap

Students

A. Carello
C. Dalton