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Revisiting the Mellieħa Bay Wreck: A report on two seasons of survey and excavation (2013-2014)

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This report focuses on the Mellieħa Bay wreck, a third-century Roman shipwreck first investigated by Honor Frost in the late 1960s. In 2013 and 2014 field schools organised by the University of Malta with the support of the Honor Frost Foundation sought to uncover what remained of the wreck, including any material culture still present. It also sought to investigate the site formation processes. A magnetometer survey revealed the location of a number of target anomalies. It could be determined that the wreck area is highly dynamic, with the scattered nature of the finds reflecting a high-energy zone, which periodically exposed the objects on the seabed. Between 2013 and 2014 it was noted that material remains were re-deposited in the wreck area over the winter months. The growth of Poseidonia oceanica eventually stabilised the site, and the location of recovered finds at the bottom of Poseidonia mattes points towards the high potential of material evidence still located within or under the mattes, as revealed in the magnetometer survey. The recovered material culture points towards a culturally homogenous site with all objects dating to the third century AD.

Keywords: shipwreck; Malta and Gozo; underwater archaeology; Roman; mortar; Mellieħa Bay

Introduction

The Mellieħa Bay wreck is a third-century AD Roman shipwreck located in a bay on the northern coast of the island of Malta (Fig. 1). Recent excavations of the site were carried in 2013 and 2014 as part of 2 three-week underwater field schools, organised by the Department of Classics and Archaeology at the University of Malta. Both seasons were supported by the Honor Frost Foundation, whose mission is to 'promote the advancement and research, including publication of marine and maritime archaeology with particular focus on the eastern Mediterranean' (The Foundation, 2020). The site of Mellieħa Bay was originally selected due to its archaeological potential, based on the preliminary investigations conducted by Honor Frost in the late 1960s. The objective of this report is to present the results of the recent investigations of the Mellieħa Bay wreck, viewed within the context of Frost's 1967 excavation and survey of the site.

The wreck site

The wreck is located in shallow waters towards the middle of the bay, situated to the south-west of a reef. The site lies approximately 700 m from the shore, at a maximum depth of 14 m (Fig. 2). It is surrounded by large meadows of *Poseidonia oceanica*. This sea-grass is highly protected and grows on bedrock, sand or on mattes. From a maritime perspective, Mellieħa Bay would have been an ideal landing place, offering good anchorage during unfavourable offshore winds to vessels. However, the reef would have posed a threat to any vessel wanting to anchor closer to shore. The bathymetry of the seabed is constantly changing, as attested by the large meadows of *Poseidonia oceanica* within the bay. *Poseidonia* mattes consist of layers composed mainly of dead *Poseidonia* leaves and rhizome deposits of dead sea-grass. On average *Poseidonia* mattes increase in height by about 1cm per annum (Frost 1969, 31). The current mattes are about 4 m in height, making these approximately 400 years old. During the

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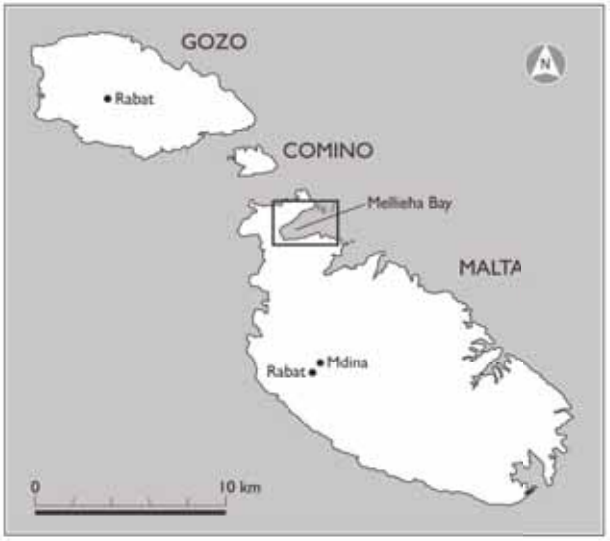


Figure 1: Location map of the Maltese islands showing the sites mentioned in the text (M. Anastasi).

prevailing winter gales that blow from the north-east, the entire bay is subject to large waves that accumulate offshore and break within the shallow waters of the bay, which in turn create a high-energy zone. It is not yet known whether the bay functioned as a harbour for trade and exchange of goods, nor as an access point to the locals who lived in the village of Mellieħa during ancient and medieval times. However, the presence of salt pans at the southern head of Mellieħa Bay in the Middle Ages (Ganado and Agius-Vadalà 1994, Vol.II, 93 and 150), does point to a degree of interaction between the operators of this complex task and seagoing vessels.

Aims and objectives

The aim of the report is to present the findings of the 2013 and 2014 fieldwork seasons, conducted by the University of Malta, with the support of the Honor Frost Foundation. The findings of the two seasons of fieldwork are presented within the context of Frost's initial investigation of the site in 1967 and publication of results in 1969. The main aim was to re-investigate the wreck area excavated and surveyed by Frost, along with a number of other areas. The site formation processes constitute an important part of the aims and objectives, allowing for an insight into how a high-energy zone impacts the depositional and post-depositional processes of a wreck site.

Site location

The Mellieħa Bay wreck site is located within the bay of Mellieħa, found along the northern coast of the Maltese Islands (Fig. 1). The bay has its entrances oriented towards the north-east, and the natural landscape around the bay varies from north to south. The northern part of the bay is surrounded by low cliffs and loose boulders, with a number of natural inlets. Towards the south, the landscape consists of steep slopes divided by valleys, and the head of the bay comprises a large sandy beach, roughly 860 m in length. A reef, consisting of rocks and *Poseidonia oceanica* sea-grass, lies in the middle of the bay, and the scatter of archaeological material is located within the reef (Fig. 3).

Historical setting

To the south of the bay lies the village of Mellieħa. Medieval texts describe this town, dating to the fifteenth century, as a district with its own militia watch post (Wettinger 2000, 371). The name of the town means salt-pans or the salt maker (Wettinger 2000, 372). In all likelihood, this toponym refers to the medieval salt pans that were present at the head of the bay in the area that is currently a protected nature reserve. One particular structure that dominates Mellieħa Bay is the so-called Red Tower, or St Agatha's Tower. This was built in 1647, during the reign of Grand Master Lascaris. It was a fortified coastal tower, equipped with supplies and ammunition. Its location, on Marfa Ridge, made it possible to monitor Mellieħa Bay along with views of Comino and Gozo (National Inventory of the Cultural Property of the Maltese Islands (NICPMI) 00033). Mellieħa Bay was a popular landing place for corsairs, who were intent on raiding the island and therefore a look-out post was essential. Two other structures built during the Knights' period are the coastal entrenchment and coastal battery. The former, also known as Ta' Qassisu, was begun in 1761 and was intended to form part of an ambitious stretch of coastal defences

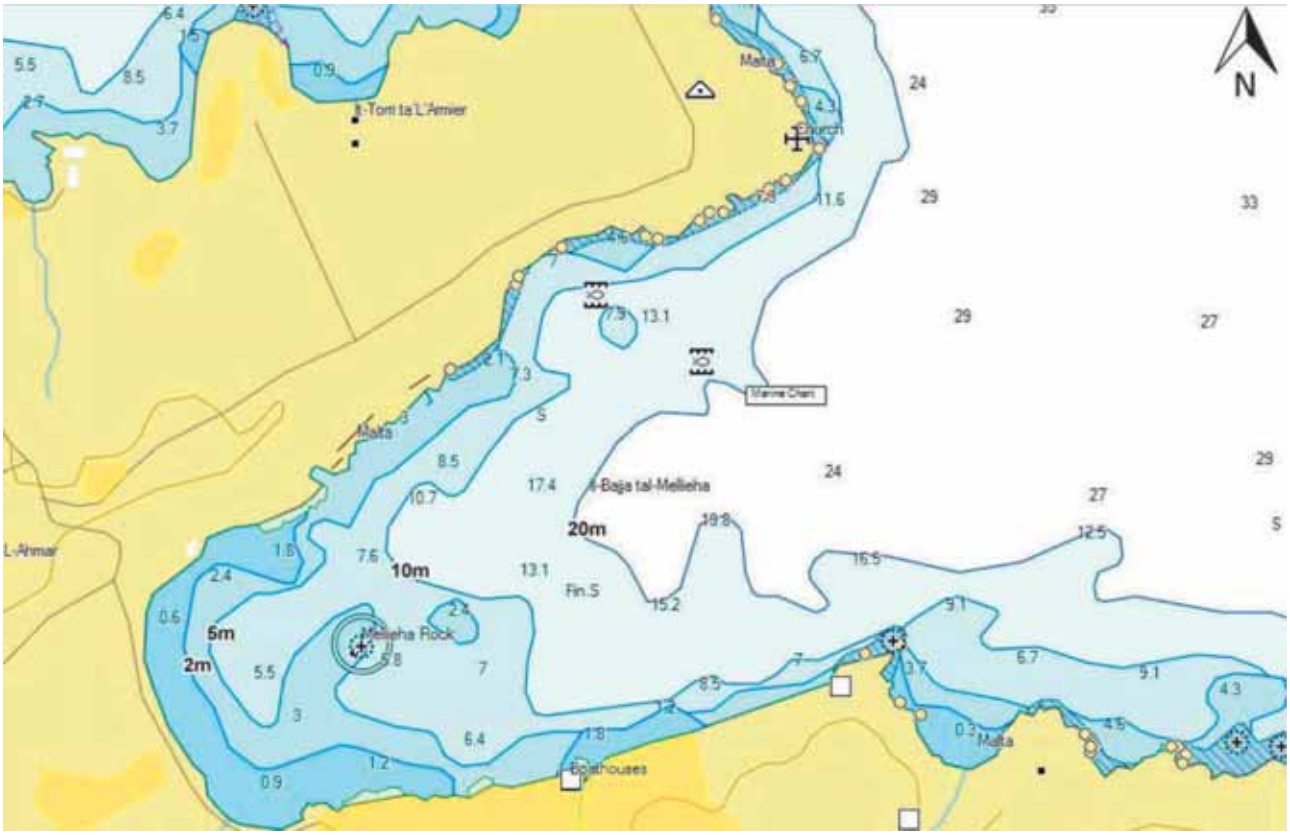


Figure 2: Bathymetry map of Mellieħa Bay. Available at: https://www.um.edu.mt/__data/assets/pdf_file/0007/362149/06BIO3060BathymetricMaps.pdf (accessed on 9th June 2020).

spanning all the way around the shores of Mellieħa Bay (NICPMI 1395). The coastal battery, also known as ir-Rasus, Westreme Battery or Mellieħa Right Battery, is one of the coastal works of fortification erected by the Knights in 1715/16. This structure functioned as a military gun post (NICPMI 1396). The above architectural heritage confirms the importance of protecting Mellieħa Bay from any unwanted raids. Although evidence points to such raids occurring during the time of the Knights of St John, it is reasonable to assume that similar events occurred in earlier times.

Previous Work

The presence of archaeological artefacts from Mellieħa Bay had been reported since 1959 (Frost 1969, 1). However, the presence of a wreck was only established in 1964 when a number of mortaria sherds were lifted by S.A/C John Haddow (R.A.F). This type of vessel was made between the first and third century AD and was commonly found in southern Italy (Frost 1969, 1). Preliminary investigations were carried out by Honor Frost in 1967, with the two-week campaign aimed at:

- Placing the site on the marine chart;
- Marking and surveying the wreck area, and
- Conducting soundings.

The results of the investigation by Frost are as follows: the area was fully mapped and surveyed, surface objects were collected and registered, and soundings were carried out in small pockets within the rocks. Objects retrieved included domestic pottery, amphorae, mortaria, glass, frit and metal objects (Fig. 4). The wreck area was extensive as defined by the distribution of the artefacts. Mortaria constituted the bulk of the cargo, together with a variety of amphorae types as a secondary cargo (Frost 1969, 2). Glass finds have been dated to the turn of the second and third centuries AD, which corresponds to the

Figure 3: Detail of Mellieħa Bay wreck area, compiled by Honor Frost (Frost 1969, 3).

Figure 4: Diver and revealed material cultural at the 1967 excavation (Frost 1969, 40).

other datable finds on site (Frost 1969, 13). From the objects retrieved it is apparent that the site consists of a Roman shipwreck datable to the third century AD. Frost remarks that 'the major part of the wreck still lies beneath the dunes of dead weed; part of the hull may be preserved in the area of deep sand' (Frost 1969, 30). This concluding statement pointed to the potential for future investigations, which led to the re-exploration of the site in 2010 by the University of Malta.

Previous finds

In 1965 the Mediterranean Underwater Research Unit began the 'preliminary investigation of a Roman shipwreck lying under a mound of dead marine vegetation in the middle of Mellieħa Bay' (MAR 1965, 4). The finds consisted of 'several pottery basins with wide horizontal rims featuring a dovetail notch pointing outwards; Dr Hayes dates these mortaria between the first and third centuries A.D., and puts their origin in the western Mediterranean' (MAR 1965, 5).

The 1967 investigation carried out by Frost resulted in a 'considerable body of information and material evidence being obtained from the site' (MAR 1967, 8). Three soundings were conducted after surface finds were collected and appropriately labelled. Two soundings were located in the north of Haddow's Valley and revealed mortaria and amphorae remains. The third sounding was located in the protected southern end of the Valley, with finds contained within small pockets (Frost 1969, 8). The majority of finds were contained within these pockets and included glass, metal, rosin and frit. The glass finds included fragments belonging to no less than 12 vessels, aggregates of brown glass and pellets of Egyptian blue frit. Further analysis revealed a homogenous group of glass that was characterised by a fine and well-preserved fabric, a colourless appearance and an antimony content that matched glass samples from Italy and the Rhine region (Frost 1969, 11-12). The brown glass aggregates seem to have been transported for manufacture, and the pellets of Egyptian blue frit could have originated from the south of Italy, as attested by a number of other wrecks in the Mediterranean (Frost 1969, 13) (Fig. 5).

A number of ceramic objects was recovered that can be considered as not having formed part of the cargo of the vessel. These objects can either be personal possessions or tableware

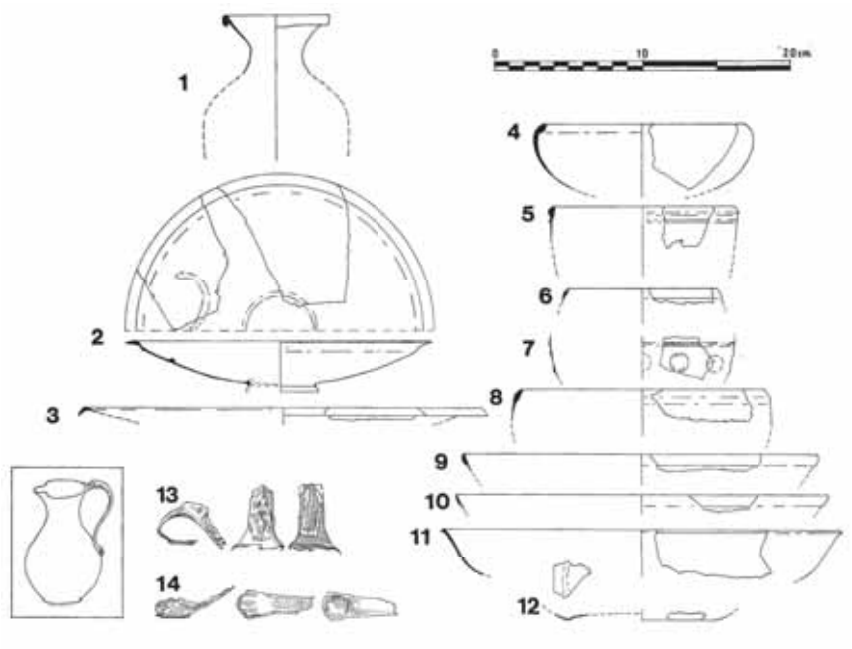


Figure 5: Glass finds from the 1967 excavation by Frost (Frost 1969, fig. 4).

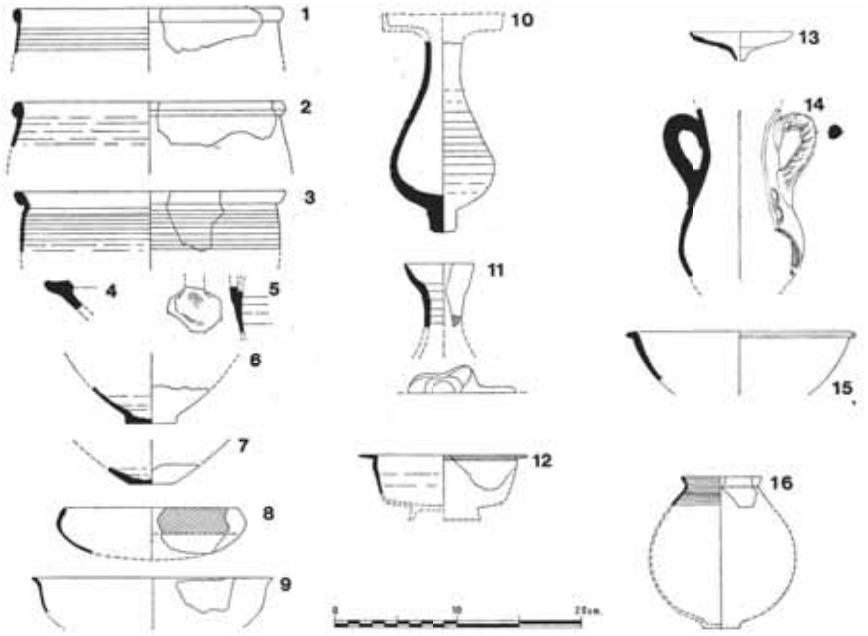


Figure 6: Small pottery finds from the 1967 excavation by Frost (Frost 1969, fig. 5).

and revolve around cooking pots, bowls, lids, jars and an unguentarium. The latter object is considered as having an Italian origin by Frost and the vast majority of the other ceramic objects are identified as having a North African origin, dated by Hayes to the early third century AD. The distinct lack of rosin on the larger ceramic sherds points towards onboard use rather than cargo (Frost 1969, 15) (Fig. 6). The recovered mortaria formed the bulk of the cargo and were identified as a type that is common in the south of Italy and are dated to between the first and third centuries AD. A southern Italian origin was further verified through the presence of crushed glass in the fabric of the mortaria, however, this might also point towards a Syrian production (Frost 1969, 19-20).

The bulk of the cargo was formed of mortaria, and the amphorae seem to have formed a secondary cargo. A notable

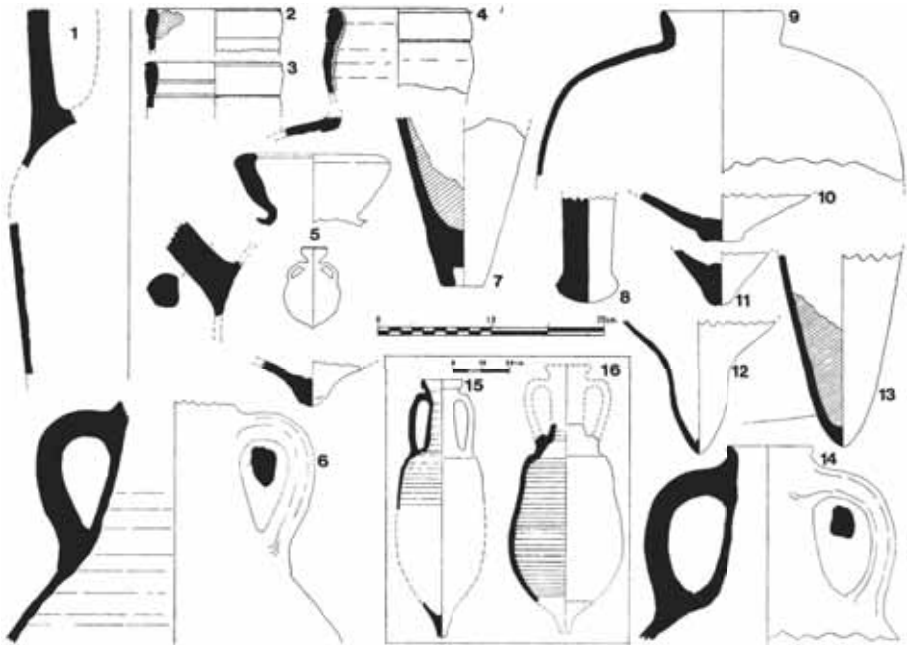


Figure 7: Amphorae from the 1967 excavation by Frost (Frost 1969, fig. 8).

characteristic of the majority of the sherds is the presence of rosin adhering to the amphorae in aggregates, predominantly in the base (Fig. 7). This points towards the rosin being the amphorae's contents rather than lining (Frost 1969, 22). A similar scenario is presented in a marble block wreck, Marzamemi I, located off the coast of Sicily. Kapitän argues that the relatively low number of amphorae, in comparison to marble blocks, points towards a secondary cargo. Aggregates of rosin were also found in the amphorae bases, which Kapitän suggests are the remains of wine, rather than the lining of the amphora (Kapitän 1961, 298). A significant number of amphorae from the Mellieħa wreck were identified as belonging to the Kapitän 1 type by Parker (Parker 1992, 274). These amphorae are characterised by a slightly everted rim, long neck and long tapered body. The handles attach from just below the rim to the shoulder, with the body ending in a hollow spiked base. The amphorae are dated to the third century AD and are postulated to have originated in the eastern Mediterranean (Kapitän 1961, 294; Williams 2014).

A number of other finds have been recovered from Mellieħa bay, including the 1960 recovery of a stamped amphora and black-slipped pottery, which could potentially belong to another wreck (Parker 1992, 294). Nevertheless, the material recovered from the 1967 excavation by Frost is consistently dated to the third century AD.

Re-exploration of the wreck site

Under the direction of the Department of Classics and Archaeology, University of Malta, a series of remote sensing surveys was carried out between 2010 and 2012 in an attempt to gather more information about the site. Three data acquisition techniques were applied in the course of these surveys, including: side-scan sonar; magnetometer; and sub-bottom profiler.

The results from the above three surveys point to a number of anomalies and targets located in the area studied by Frost in 1967 (Fig. 8). In 2012, an underwater survey carried out by a team of divers from the University of Malta was conducted at the Mellieħa site. The purpose of this survey was primarily to relocate the site; secondly to map and survey Haddow's Valley, so named by Frost's team 'because it was the area Haddow had originally shown' Frost in 1965 (Frost 1969: 2); and thirdly to establish whether the area had undergone any changes. It transpired that Haddow's Valley was more or less intact and that cultural material was still present in the area of study. As the site was

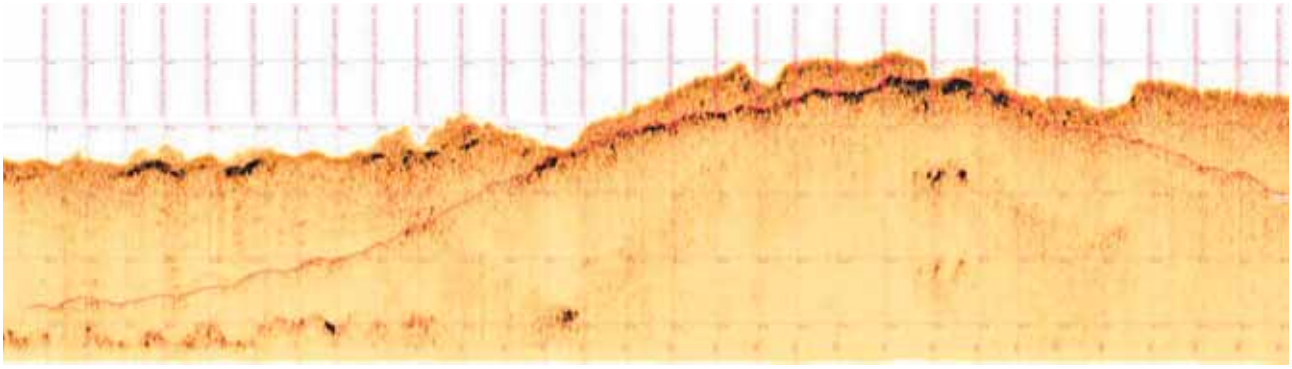


Figure 8: A sample of the data collected from the sub-bottom profile survey carried out in 2012 (Gambin 2013, 4).

found to be substantially intact with potential for further documentation, it was decided to carry out investigations starting in 2013.

Methodology

The field school in 2013 ran over a three-week period from 3 June to 22 June, whereas the one in 2014 started on 9 June and ended on 27 June. Works were being carried out from Monday to Saturday during the 2013 season, however, the following year it was decided not to carry out diving operations on Saturdays due to the intensity of maritime traffic in the bay.

Aims and objectives

The primary purpose of the 2013-2014 field schools was educational. Students reading for a MA degree at the University of Malta participated in the project, and were introduced to the different aspects that an underwater excavation entails, including logistic preparation, organisation and day-to-day activities that are required on site. The secondary purpose was the investigation into a number of research questions that would generate results that contribute not only to the knowledge of this particular site, but also to the wider field of maritime archaeology in Malta. The specific objectives were:

• To establish the extent of the Mellieħa Bay wreck and what percentage of it is still intact;
• To determine whether any material culture was still present in the area of study;
• To attempt to identify targets and anomalies resulting from the remote sensing surveys, and,
• To determine the effect of high-energy wave action on the site.

Over the course of the two field seasons a number of exercises were conducted in order to achieve these objectives. These included:

1. The creation of an up-to-date plan of the area under study;
2. The labelling and photography of surface finds;
3. The plotting of surface finds onto a map;
4. The collection of loose finds to provide information on site formation processes, and query to what extent high-energy wave action affects artefact deposition;
5. The investigation and excavation of sandy bottom and unexplored adjacent areas, in order to determine the presence of cultural material;
6. To confirm magnetometer anomalies in the area of study.

Coordinate system and positioning

All positional data was acquired using a handheld Garmin GPSMAP 60CS global positioning system. Positions are stated in Easting and Northing, based on the Universal Transverse Mercator coordinate system (UTM) using the World Geodetic System 1984 (WGS 84) ellipsoid. The Military Grid Reference System (MGRS) was also used when plotting the points, as this applies 1km squares and thus simplifies plotting.

Organisation of 2013 and 2014 Seasons

During both seasons, daily planning was generally undertaken by the project director, Professor Timmy Gambin, and site supervisors Tony Burgess, Elaine Azzopardi and Stephanie Said. This was supplemented with feedback from all the other participants. Briefings included planning the dives, organising surface support and listing the miscellaneous tasks that needed to be completed each day. The dive teams would consist of either a pair of divers or three divers, depending on the task being undertaken. A standby safety diver would always be suited up in the case of an emergency. Whilst the teams were underwater, the other participants would either be operating the boat, managing the pump or conducting post-excavation works. Divers were rotated and the different teams undertook a handover from the previous divers. The first divers were generally deployed at 09:30 and the rotations continued until 15:00. Diver observation forms and project notebooks were filled in by each diver and any data gathered in the site diary.

Equipment

One boat served as a diving platform, transporting the divers to the site and back, and was anchored on site on a single point mooring for the duration of the project. A raft, consisting of a frame that was made buoyant by plastic tanks, was constructed from aluminium pipes, and was used as a base for the pump operations and the standby diver. The raft was secured above the site throughout the three-week period, using a three-point mooring system. A custom-made water dredger was driven by a small Honda water pump, facilitating sediment removal. The pump was fixed onto the raft, to ensure that it did not move with any vibrations or waves. The hose was made long enough to reach the required depths without interfering with ongoing works.

Recording, excavation and positioning

The primary methodologies used during the fieldwork were preliminary mapping, conducting searches and surveys leading to excavation of various areas of the site. During the 2013 season Haddow's Valley was mapped, with metal stakes fixed into the ground at the boundaries of the Valley (refer to Fig.10). These were labelled from A to D running in a north-south direction and baselines were fixed from points A to B, from B to C and from C to D, allowing for the division of the Valley into different areas. Measurements were taken using offset baselines and recorded on Permatrace (Fig. 9). Due to the large distances, a scale of 1:2 m was utilised. Simultaneously a description of the bathymetry was taken, along with heights of the *Poseidonia* mattes. The finished site plan was scanned and digitised in Inkscape, a free and open-source vector editor (Fig. 10).

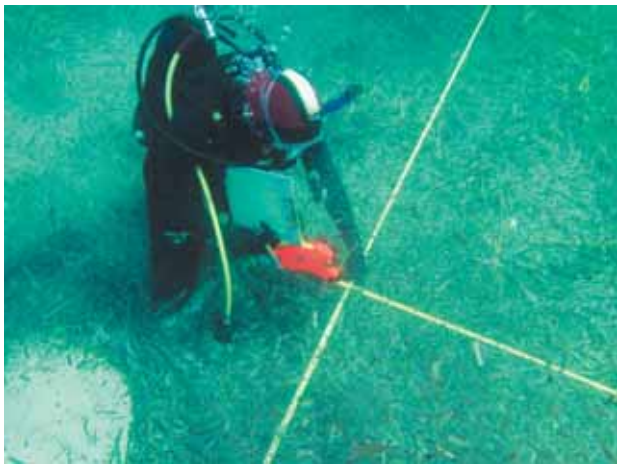


Figure 9: Recording using the offset method (Photo by G. Mattson 2013).

Following this, all surface finds found within the Valley were labelled according to which area they fell under, making it easier to identify their location. Their position was taken by means of offsets from the baselines. These measurements were then recorded in the site notebook and plotted onto the map, which was continuously updated. Once the information for the artefacts was gathered, each labelled item was bagged and lifted. Two new points were added to the site, points E and F, lying to the west and east of the Valley respectively (Fig. 11). These two markers were placed in order to further extend the planning of the site. To the west, towards point E, a number of depressions were uncovered, which were filled with dead *Poseidonia* sea-grass,

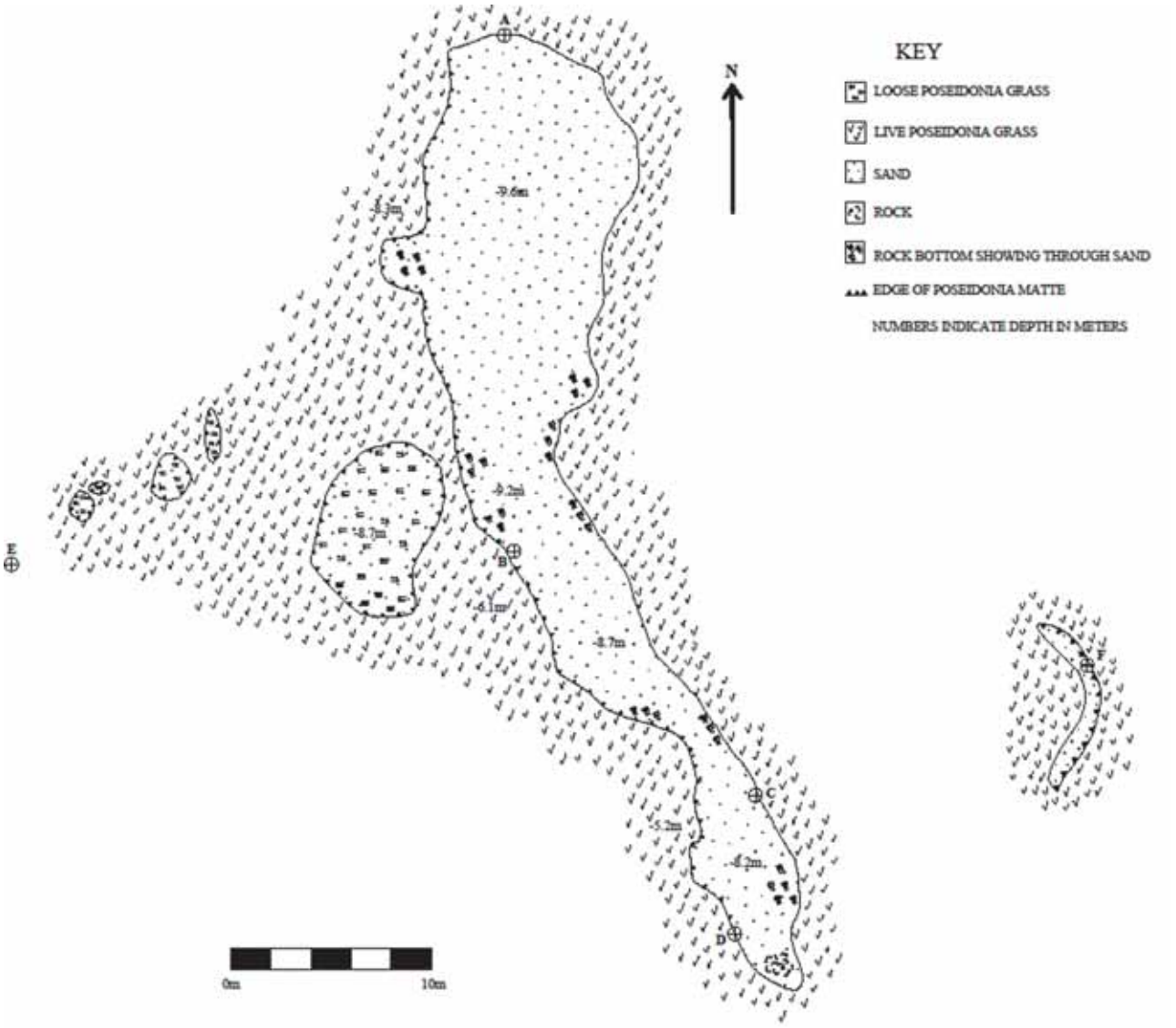


Figure 10: Plan showing Haddow's Valley as documented in 2013 (Drawn by S. Said 2013).

whilst to the east a semi-circular shaped feature was located and named the 'Crescent' area. This latter area was found to contain a substantial amount of ceramic remains. The same procedure as that practised in Haddow's Valley was followed for the documentation and recovery of artefacts found within these two areas.

Excavation works on trial areas were carried out using a water dredge. The bedrock in the southern part of Haddow's Valley is close to the sandy surface, making it highly unlikely that any archaeological deposits were present. It was therefore decided to excavate in the northern part where the sand layer was significantly thicker. Material was removed from one area and the debris was deposited away from the site. Loose *Poseidonia* was removed from the surface, followed by the removal of sand down to rock surface. Areas earmarked for excavation were delineated by a 2 m by 2 m rigid grid and each quadrant was given a label and excavated separately. A total of six such areas were excavated covering an area of 90 m^2. Hole 1, found due west of Haddow's Valley, was also excavated using one grid. One other grid was placed between point C and D, beneath the *Poseidonia* matte (Fig. 11).

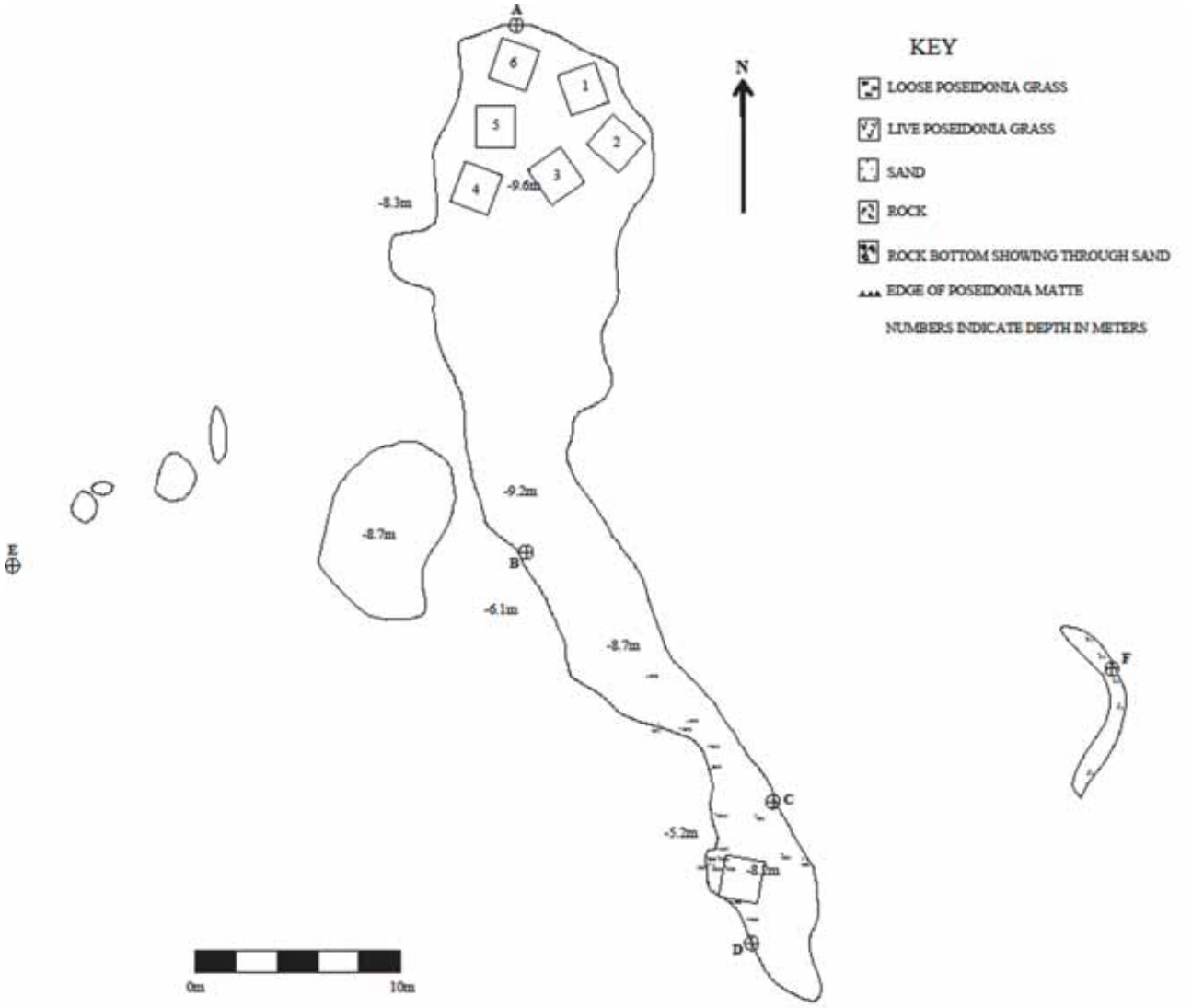


Figure 11: Plan showing the location of finds and position of grids (Drawn by S. Said 2013).

During the 2014 season the primary focus was to map and explore the areas surrounding Haddow's Valley. A new area, previously unmapped, named as the 'Figure of Eight' was identified, mapped and integrated into the generic map of the archaeological area (Fig. 12, points 1A-C), located just north of Haddow's Valley. Results from these excavated areas are described below. Swim searches were conducted in the 'Figure of Eight' area, and two sondages were excavated within 2 m by 2 m grids that were laid out in the western part of the area. Both squares were excavated to bedrock, which at its maximum extent measured just over 1.5 m below the seabed. No archaeological deposits were discovered in this area. Another previously unmapped area, identified as 'Lake Bed', lies south of Haddow's Valley (Fig. 12, points 2A-B). This area contained a small concentration of ceramic objects mainly consisting of fragments of mortaria (Fig. 13). A third area located due west of Haddow's Valley was named 'Snake Pit' and recorded (Fig. 10, points 3A-B), however, no finds were recorded within the area. The area of Haddow's Valley, located in the 2013 field school, was revisited for inspection in 2014. The area had already been mapped and all visible objects had been lifted during the previous year's excavation. However, during the re-inspection dives, new objects were visible within the valley.

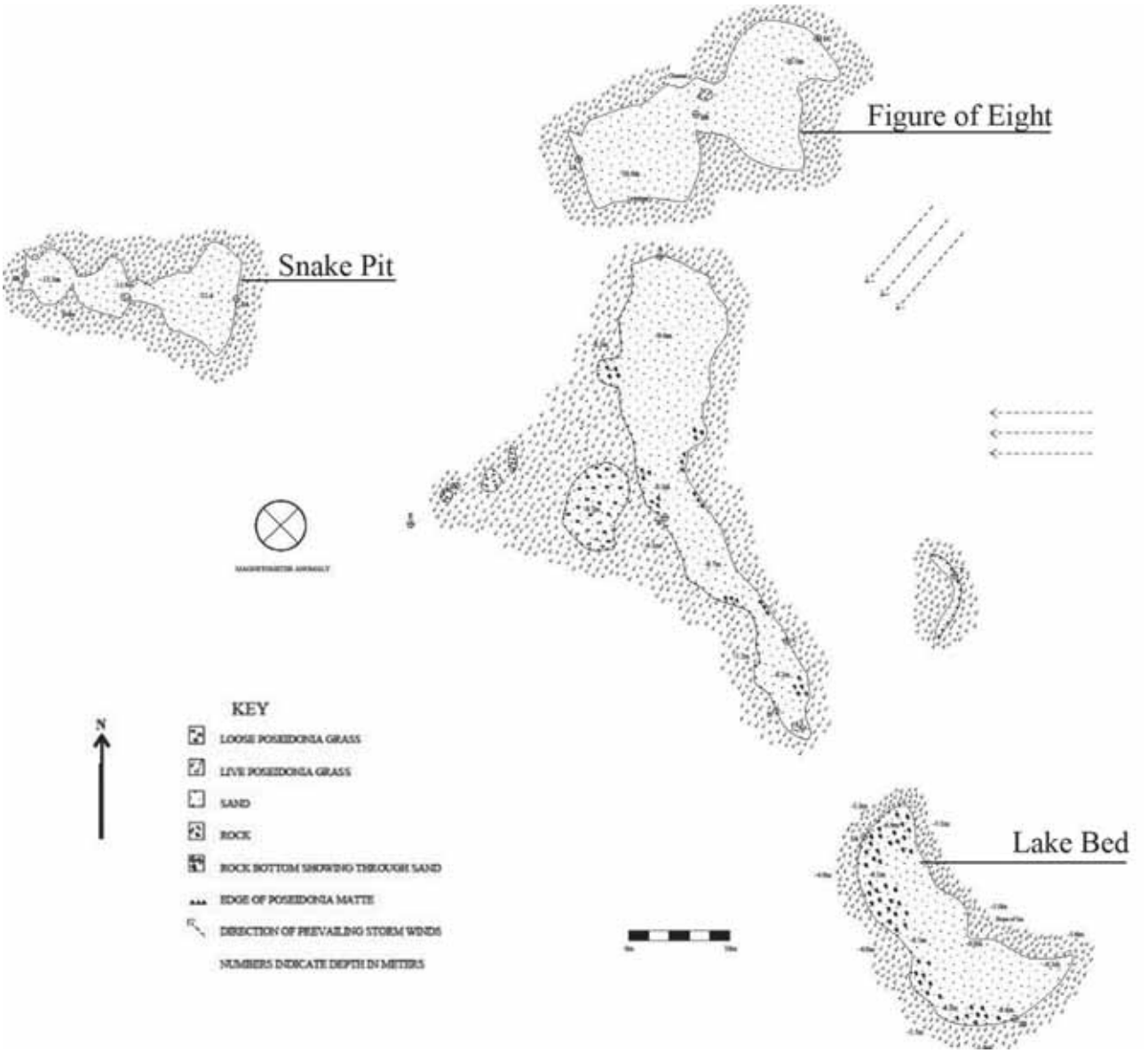


Figure 12: Plan of areas documented during the 2014 season (Drawn by S. Said 2014).

This implies that the site is situated in a high-energy zone, with winter storms dislodging objects from within the *Poseidonia* mattes and depositing these within Haddow's Valley. Markers from the previous year's excavations were located and the finds were mapped in situ, labelled and collected.

A series of magnetometer surveys was carried out in various areas of the site, and a total of 11 survey lines were taken in the outer eastern extent of Mellieħa Bay. Survey lines were also taken towards the western side of the bay and closer towards the swimming zone of the existing hotel. These lines were approximately 100 m in length. A series of swim searches was conducted in areas close to where preliminary results from the 2014 magnetometer survey had suggested possible anomalies. One particular area of interest was noted and marked however, these targets are situated under deep *Poseidonia* mattes and this did not allow for further investigation, suggesting potential further research and excavation.

Results: 2013 season

The areas explored during the 2013 season were already investigated by Frost and consisted of Haddow's Valley and smaller exposed areas,

Figure 13: Mortaria sherd found within the 'Lake Bed' area (Photo by G. Mattson 2014).

referred to as 'Crescent' and Holes 1-5, lying to the east and west of the Valley, respectively.

Haddow's Valley, which consists of a sandy bottom with some exposed rock, is approximately 50 m in length from point A to D and runs in a north-south direction. The Valley is widest at its northern extremity, measuring 11 m, and narrowest towards the south, measuring 1 m. The Valley is demarcated by a 4 m *Poseidonia* matte to the west and *Poseidonia* sea-grass to the east. It was noted that a notch was cut into the lower half of the matte, between points C and D, possibly during Frost's excavation in the late 1960s. Holes 1-5 were surrounded by sea-grass and covered with dead *Poseidonia* sea-grass which had to be removed prior to the excavation. The largest and deepest pocket, Hole 1, which is located roughly 0.5 m away from the Valley, has a maximum depth of 8.7 m, and is 4 m wide and 8 m long. The other four Holes varied in size, yet none was larger than 1 m in diameter, and they were found at a distance of roughly 12 m due west of the Valley. The 'Crescent', the last area to be located and documented during the 2013 season, is located approximately 20 m due east of Haddow's Valley. It has a length of 12 m and is not wider that 0.5 m. The seafloor of the 'Crescent' consists of sand and rock, demarcated by *Poseidonia* sea-grass on its western side and a low matte on the eastern side.

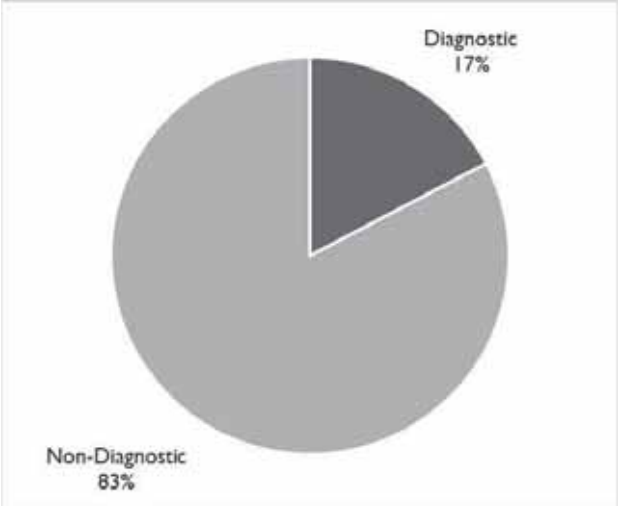


Figure 14: Chart indicating the percentage of diagnostic and non-diagnostic finds.

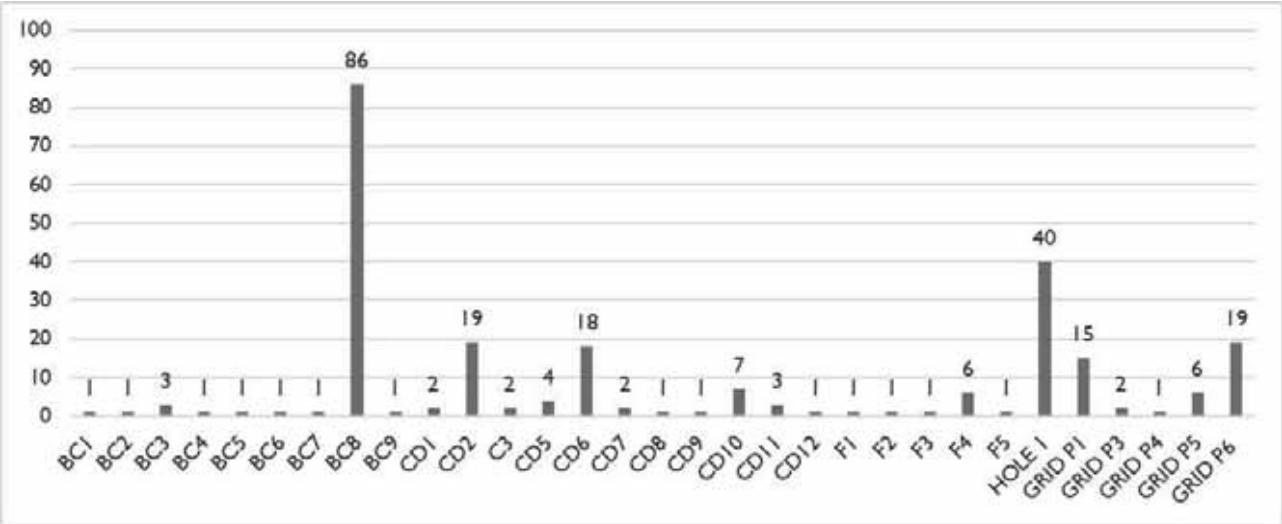


Figure 15: Summary of 2013 finds and their respective location.

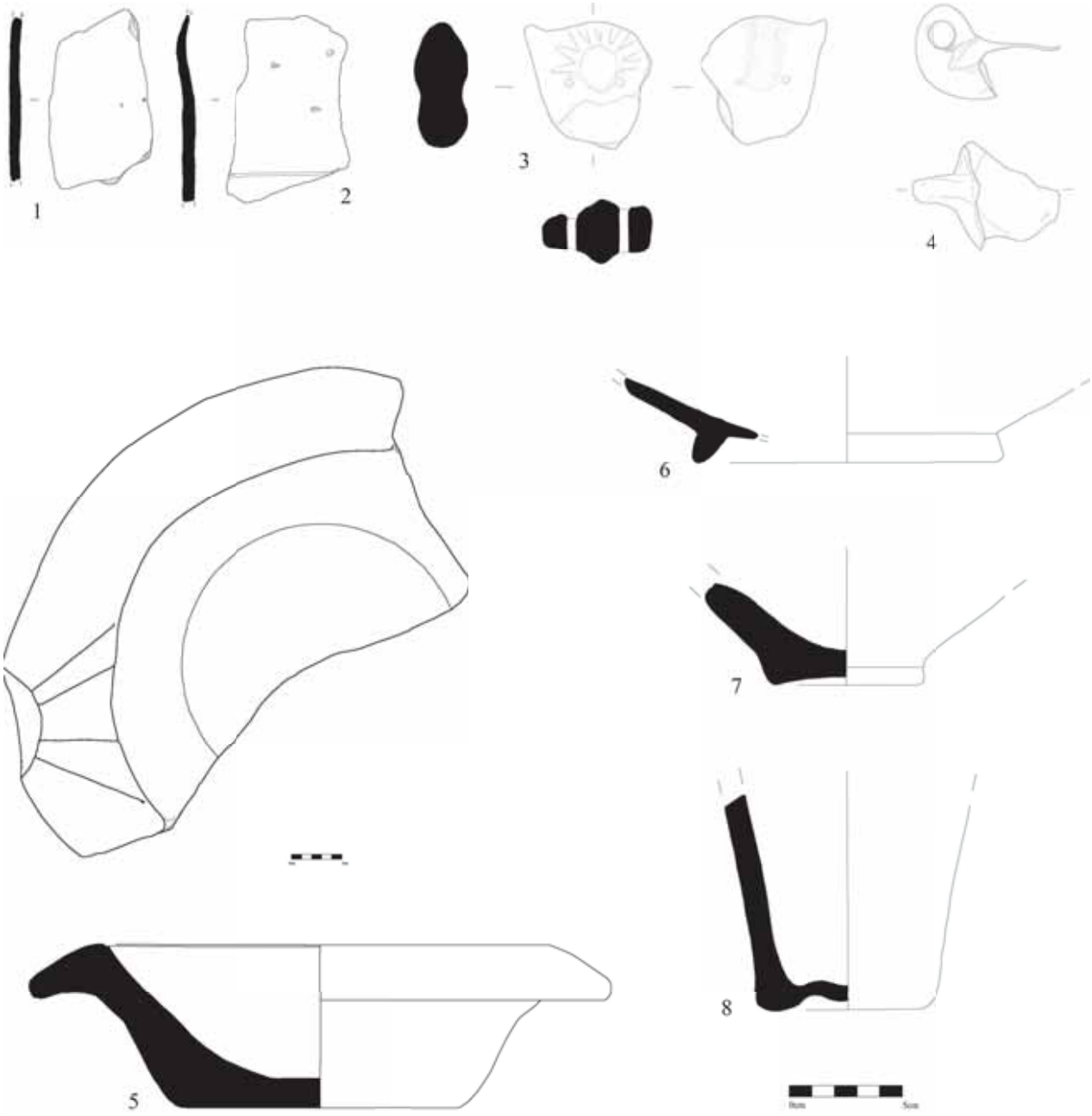


Figure 16: 1-2) Two amphorae sherds: MLH13/F1; MLH13/F5; 3) Pendant (MLH13/BC7); 4) Lamp (MLH12/F5); 5) Mortarium (MLH13/BC8); and 6-8) bases (MLH13/CD5; MLH13/BC8; MLH12/CD5) (Drawn by S. Said 2014).

Recovered artefacts

A high concentration of artefacts was recovered from the southern part of Haddow's Valley, between points B, C and D. Artefacts were also recovered from within the 'Crescent'. The grids, located in the northern section of the Valley, also produced a number of artefacts, along with Hole 1 (Fig. 15). All the artefacts consist of ceramics, and no metal or inorganic material was discovered during the 2013 season. The highest concentration was found at BC8, located close to the notch cut into the *Poseidonia* matte. The finds are divided between diagnostic and non-diagnostic, with a large percentage of finds being non-diagnostic (Fig. 14). It is important to note that all finds were abraded and

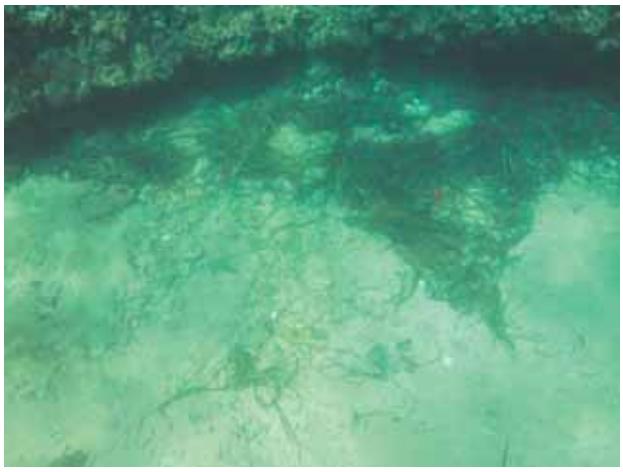


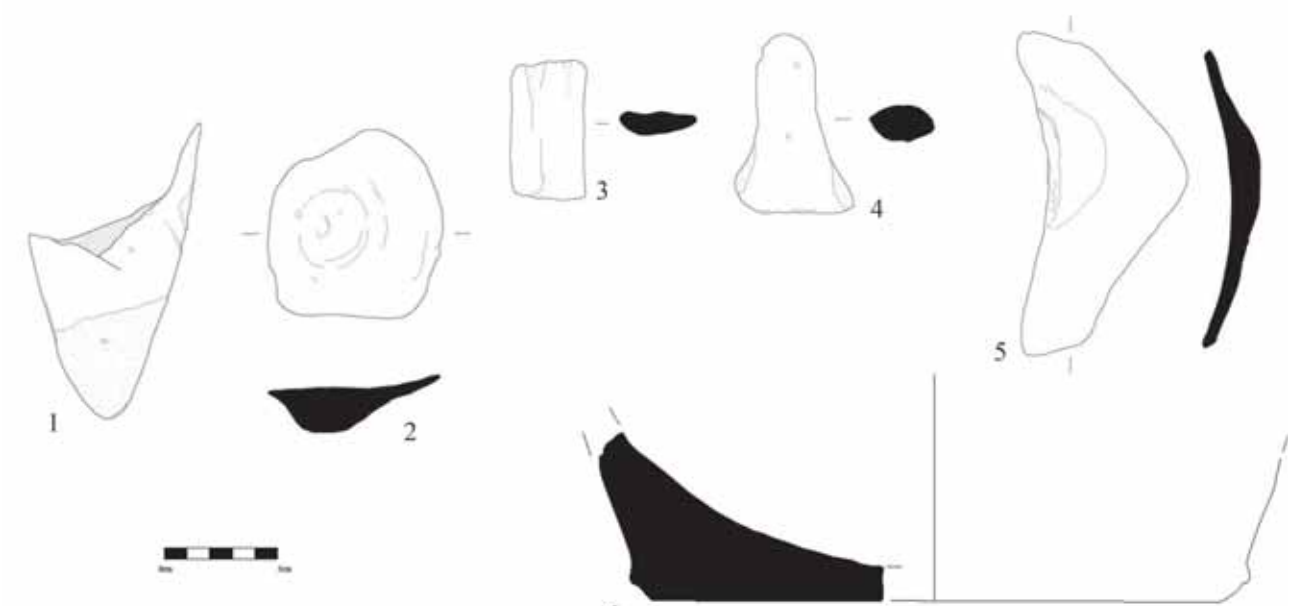
Figure 17: Location of artefacts within the 'Lake Bed' area (Photo by G. Mattson 2014).

smoothened, except for the larger pieces whose fabric was gritty and contained large inclusions. This is expected due to the weight of the larger pieces, since this would make these finds less susceptible to being moved around on the seabed.

The larger pieces generally consisted of mortaria sherds. The central section of the Valley produced no finds, however, material was located in Hole 1, which is adjacent to the central area of Haddow's Valley. The bulk of finds was collected from the area between point C and D, with BC8, CD2 and CD6 producing the majority. However, out of 123 finds only 12 were diagnostic. The 'Crescent' produced the lowest number of finds, however, with the largest sherds belonging to amphorae and a small lamp (Fig 16.1-2, 4). The diagnostic sherds consisted of rims, handles, sherds with partial handles, bases and mortaria pieces, with the largest groups comprising handles, followed by mortaria pieces, rims and bases. Frost presents most of the pottery sherds as being 'of a standard North African (Tunisian) type' (Frost 1969, 15), which Frost uses to suggest that the ship may have been exclusively loaded in North Africa (Frost 1969, 15).

The most intact finds were the small lamp (F5) and pendant (BC7), along with a mortarium (BC8) (Fig. 16.3-5). The mortaria sherds were the heaviest pieces and those least likely to be transported by sea currents, and these were located in Grid position 6, Hole 1 and BC8. The handles were located in all areas and the rims were found in BC8, CD3 and F4. The three bases were located at CD5 and BC8, with one particular base found to be containing rosin (Fig. 16.6-8). The large percentage of non-diagnostic finds consisted of sherds and a handful of concretions, which were irregularly shaped, grey

Figure 18: 1-2) Two ceramic bases: MLH12/Grid 1A2; MLH14/LB5; 3-5) Three ceramic handles: MLH14/HV2a; MLH14/LB5a; MLH14/unknown; 6) Mortar base: MLH12/HV2b (Drawn by S. Said 2014).



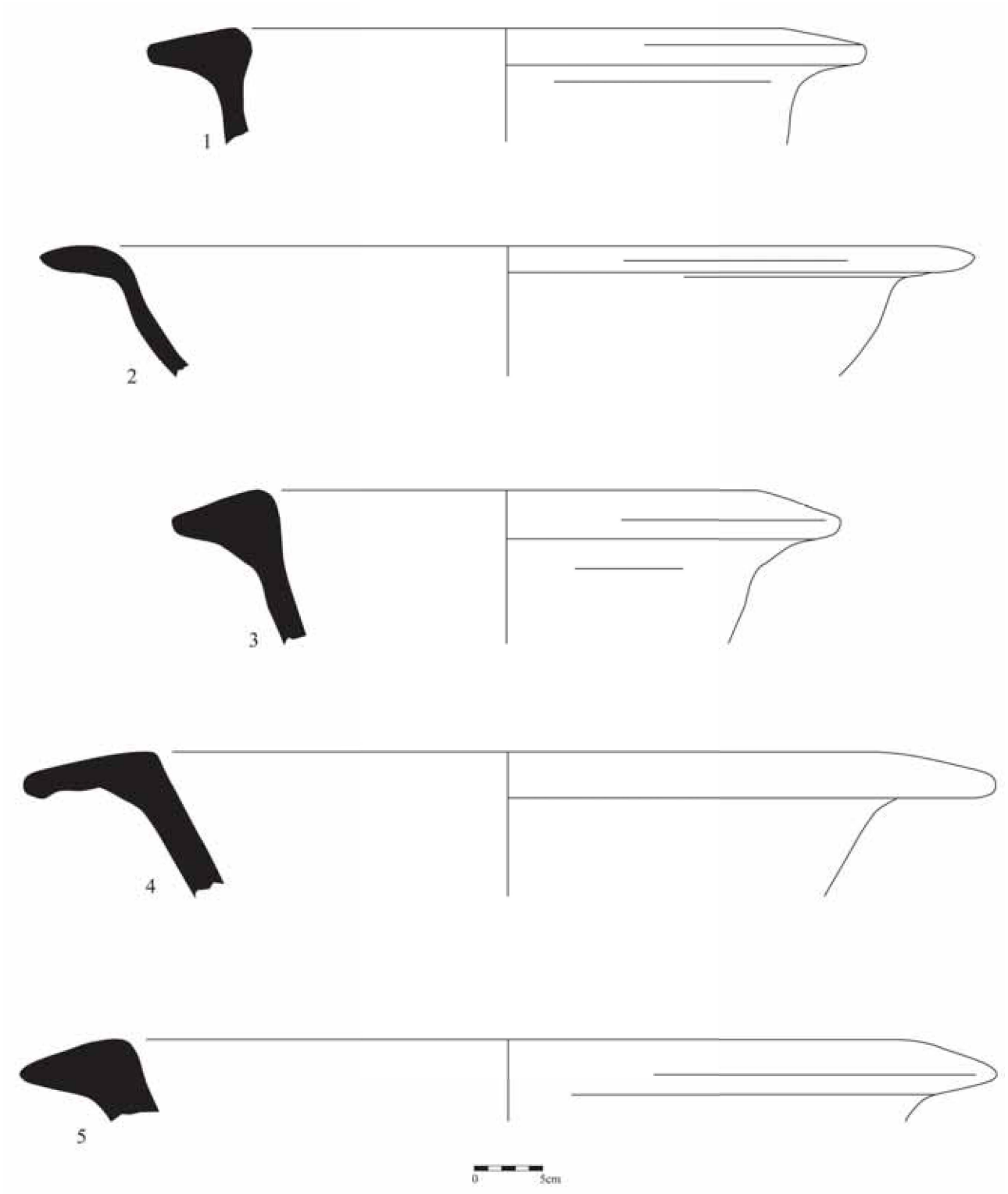


Figure 19: Five mortaria rims: 1) MLH/unknown; 2) MLH14/HV1; 3) MLH14/LB4; 4) MLH14/LB6; 5) MLH14/LB9 (Drawn by S. Said 2015).

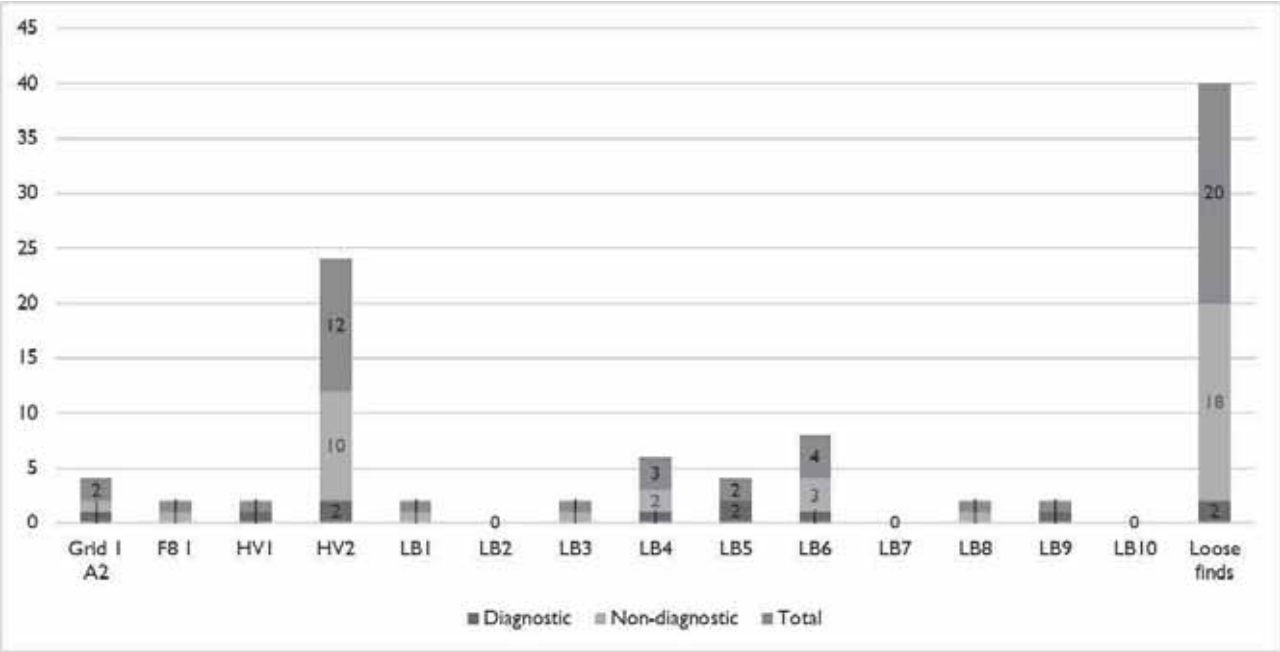


Figure 20: Percentage of diagnostic and non-diagnostic finds and their location.

in colour and small in size. The large number of sherds varied in size and colour, from a light creamy pink, and reddish brown to grey. Some sherds contained inclusions in the fabric, including white, black and shiny flecks. A majority had a smooth fabric, whilst others were grittier. A good number of sherds contained rosin on the inner surface, most of which came from the areas between points B, C and D. The presence of rosin on the inside of these ceramic fragments points to wine-carrying amphorae.

Results: 2014 season

During the 2014 season Haddow's Valley was re-explored along with the exploration and documentation of three other areas. These were 1A-1C (Figure of Eight), 2A-2B (Lake Bed) and 3A-3B (Snake Pit), with only area 1A-1C already previously explored by Frost (1969, 6) (Fig. 12). In the 'Figure of Eight' area the seabed consists of a sandy bottom, demarcated by *Poseidonia* sea-grass. The depth is approximately 10.5 m, and sondages were excavated, reaching a depth of 1.5 m. However, no cultural material was retrieved, with the exception of one fragment of frit, the base of an amphora containing rosin and a glass fragment. The 'Lake Bed' area is located to the south of Haddow's Valley and the seabed here consists of exposed bedrock on the western half and sand on the eastern half. The western edge is marked by a 1.2 m *Poseidonia* matte, whilst *Poseidonia* sea-grass is found along the eastern edge. Depths in this area range from 4.9 m in the north to 6.4 m in the south. Of interest here is that the majority of finds were located in this area, found scattered over the surface towards the north-western side of the area and consisting mainly of metal fragments and ceramic sherds (Fig. 17).

The 'Snake Pit' area is located approximately 45 m west of Haddow's Valley, with depths ranging between 11-12 m. The seabed consists of sand and the area is demarcated by *Poseidonia* sea-grass. No cultural material was retrieved from this area.

Recovered artefacts

The highest concentration of finds was located within the 'Lake Bed' area, with a total of 13 finds, five of which were diagnostic pieces, and all lying exposed on the seabed. Overall, there were more non-diagnostic finds than diagnostic. The diagnostic artefacts consisted of an amphora base, one ceramic base, three ceramic

handles, five mortaria rims and one mortaria base (Figs 18-19). The number of finds and their respective locations are presented in figure 20. One glass fragment and one frit fragment were located within the 'Figure of Eight' area, and other non-diagnostic artefacts consisted of ceramic sherds, metal fragments, a porous stone, metal conglomerations and two small wooden fragments.

Discussion and conclusion

When it comes to the site formation processes of the Mellieħa Bay wreck, it can be deduced that the area is highly dynamic, with the reef located in the centre acting as a hazard to vessels navigating and anchored in the bay. The scattered nature of the finds reflects a high-energy zone, and given the prevailing north-easterly winds, it is highly likely that the vessel struck the reef and proceeded to founder in the area under investigation. The growth of *Poseidonia* occurred after the foundering event and it can be assumed that the vessel broke up and spread during, and after, the foundering. In addition, for a significant period of time the objects on the seabed were periodically exposed to the high-energy nature of the bay, with the eventual growth of *Poseidonia* sea-grass stabilising the site. The finds retrieved from Haddow's Valley and the surrounding areas can be characterised as being in a secondary deposition position. This is evident from the worn, smoothened and often abraded character of the finds, further indicating mobile depositional and post-depositional processes. Additionally, the retrieved finds were located at the bottom of the *Poseidonia* matte, indicating that there is a high potential of material evidence still within or under the mattes, as indicated by the anomalies detected during the magnetometer surveys. In fact, during the 2014 season material remains were found to be re-deposited in Haddow's Valley over the course of the winter months. It is being postulated that these are being dislodged from the *Poseidonia* matte, and that the notches cut by Frost on the bottom of the matte have facilitated this process. The high-energy nature of the site, already evident in the 2013 season, is clearly spreading objects beyond Haddow's Valley, as attested by finds recovered from the 'Lake Bed' area.

Thus, on the basis of what was explored and investigated in the 2013 and 2014 seasons it can be confirmed that this is a chronologically homogenous site with all objects dating from the third century AD. Of particular interest is the 'pendant', which possibly represents Sol Invictus, the cult of the official sun god, first made official by Emperor Aurelian in 273 AD (Leppin 2011, 102). The 2008-2010 discovery of five shipwrecks, close to the Italian island of Ventotene, sheds further light on the possible layout of the Mellieħa wreck. The Ventotene III wreck is located in deep waters and has remained relatively undisturbed over the millennia due to the gentler currents at these deeper depths. Here the mortaria were placed on the upper levels of the cargo sections, with the lower levels comprised of amphorae, and from the evidence gathered it would seem the Mellieħa wreck had a similar layout.

Thus, it can be said that 'the major part of the wreck still lies beneath the dunes of dead weeds […]. This report will have served its purpose if it stimulates future marine archaeologists, who will have acquired improved techniques and accumulated more experience, to pursue the research' (Frost 1969, 30).

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