

Three Decades of Adventures with Honor Frost in Crete

*Elpida Hadjidaki**

**Director Phalasarna Excavations, PO Box 14, Kisamos, Crete 73400, Greece, hadjidaki@gmail.com*

This article describes the author's relationship with Honor Frost over 30 years, particularly their first visit to the archaeological site of Phalasarna, West Crete. Emphasis is placed on the finds of the 2015-2017 excavation seasons, which include a new section of the quay, a slipway, two new towers, a mechanism to support a chain that closed the harbour, and a merchant's house. Underwater excavations of a Classical shipwreck at Alonnesos, Northern Sporades, and a Minoan shipwreck at Pseira, East Crete, are also briefly described. Honor Frost was involved in all these projects.

Keywords: Phalasarna, Hellenistic, harbour, Honor Frost, Pseira, Alonnesos.

I met Honor Frost in the 1970s when I was a student in England trying to settle on a career. I knew it should combine history and the sea, but I had no role models for what I could become, until I met Frost. She was a diver, travelled the world, made discoveries, and was fearless. She became the most important influence on my professional life. We often travelled together, exploring archaeological sites, diving, or attending conferences together in places such as England, France, Bulgaria, and Cyprus (Fig. 1). I not only gained knowledge of diving archaeology from her, but I learned to share her lifelong passion for ships and harbours.

There are the three main lessons I learned from Frost: 1. Help the younger generation. 2. Be fearless and passionate. 3. Do serious and lasting work.

The harbour of Phalasarna

To illustrate some of these points, I will begin with the story of a day I spent with Frost in 1984. At this point we met regularly; I would stop off to see her in London when I flew to America where I was pursuing my PhD and she visited me in Greece in the summers.



Figure 1. The author with Honor Frost, Dokos Island, Greece (1991). (Photo K. Jachney).

When she came to see me in Chania in Crete in 1984, we decided to visit Phalasarna, a site located on the far western shores of the island. Phalasarna was an ancient town that Skylax described as an old city that had an artificial port and a temple dedicated to the goddess Artemis. I was settling on a topic for my dissertation. I had read Honor's articles on the Phoenician harbour-works along the coast of Lebanon at Tyre, Sidon, and Arward (Frost, 1972, 1973) and, after several brief trips to Phalasarna, I suspected I saw similar elements there in the uplifted and silted-up port – although most archaeologists at the time doubted there was a harbour there at all.

It was a very long day. We started by visiting Grambousa, an island off the north-western tip of Crete topped by a magnificent Venetian castle. An old fisherman agreed to take us out but, on the way back, the motor on his small boat broke and we had to row the rest of the way. Eventually, after four hours, we got back to Phalasarna. At that time nothing had been excavated but graves, and Frost was no more convinced than most other researchers that the harbour was in the location I had identified. It was marked then by nothing but small hills covered with bushes and carob trees. When we got back to the village, a few of the locals who had gathered around told us they hated archaeologists and said if we ever came back, they would shoot us. If anything, Honor found this amusing, and she proposed we have coffee with them. Death threats were not something to deter one of the world's first female divers, and the first female diving archaeologist.

That day became the starting point of the work I have been doing at Phalasarna ever since. There were many important lessons learned that day. One was to refuse to be governed by fear of operating in a hostile environment. Another was that archaeological work does not happen in isolation: it deeply affects people in the



Figure 2. Altar dedicated to the Phoenician goddess Astarte. (Photo E. Hadjidaki).

surrounding community and unless one becomes part of that community the work may not be possible. A third lesson was that it is one thing to suspect one has, say, found a Greek port with Phoenician influence, a *kothon*, and quite something else to prove it. This effort took many years.

I have continued to work at Phalasarna for three decades. All along, as the discoveries were slowly progressing, Honor's reaction was simultaneously intense scepticism and intense support. She challenged me to prove my suspicion that the Phalasarna harbour resembled a *kothon*, but she also encouraged me in the strongest terms to keep at it and never give up. Her extraordinary personal knowledge of archaeological sites and monuments was of great value. When she saw the 'throne' of Phalasarna (Fig. 2) she recognized it as an altar dedicated to the Phoenician goddess Astarte, for she had seen many similar altars along the Syro-Palestinian coast. Meanwhile, I argued it was dedicated to Poseidon since Poseidon's trident, and a dolphin, are the symbols depicted on Phalasarna's coins. Eventually she published her interpretation, and she was right as always (Frost, 1995: 19).

The evidence for the location of the harbour of Phalasarna is now overwhelming. Figures 3 and 4 provide overviews of the site. The discoveries of fortification towers and other elements of the harbour were described in Hadjidaki (1988) and Frost and Hadjidaki (1990), evidence of the Roman destruction was summarized in Hadjidaki (2001), and detailed evidence for a massive earthquake that raised the harbour more than 6.5 m above the sea is in Pirazzoli *et al.* (1992) and Dominey-Howes *et al.* (1999). I will review some of the most important finds with an emphasis on the three most recent seasons, 2015 to 2017.



Figure 3. Uplifted harbour of Phalasarna as it appeared in autumn 2017. (Photo Panagiotis Partsinevelos).

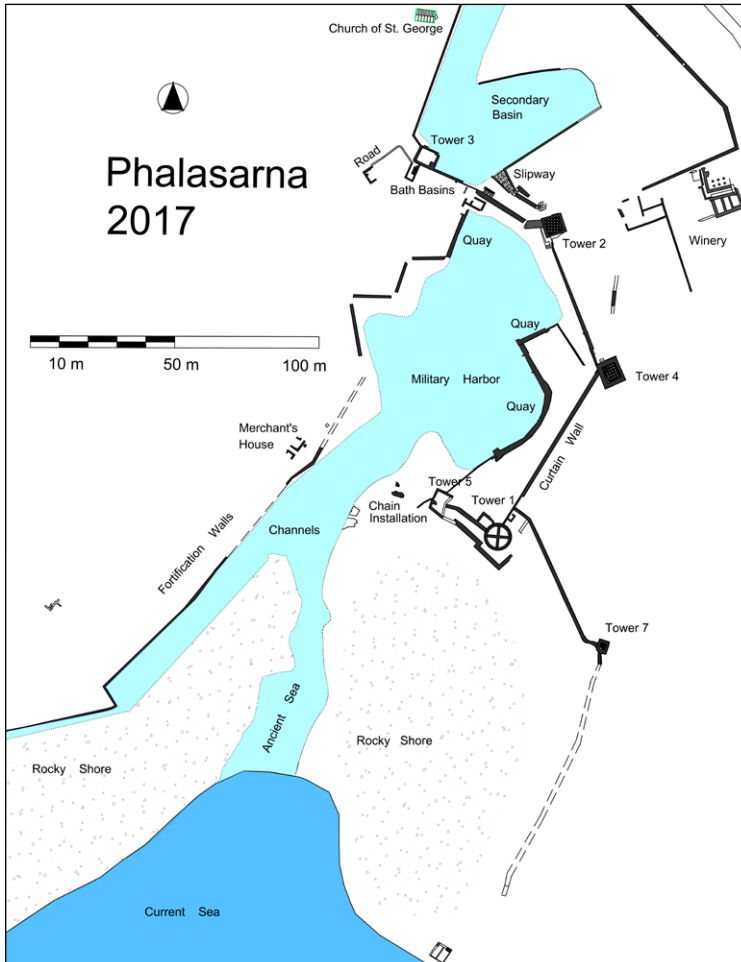


Figure 4. Plan of Phalasarna harbour site. (Drawing N. Hadjidakis & Michael Marder).

Harbour and defensive towers

Excavation at the harbour of Phalasarna began two years after that first visit with Honor, in the summer of 1986. In the very first excavation season we established the shape of the port and identified the fortification walls that defended it. It was exactly as Skylax had described it, ‘a closed port’ (*limen kleistos*, Skylax 47), it was encircled by the city’s fortifications and had a long artificially cut channel connecting the basin to the sea that could be closed off with a chain. The depth of the sea water in the basin was around 1.8 m.

We uncovered the lower 5 m of a magnificent round tower with a decorative moulding around the third course, *kymation*, reminiscent of an Ionian column. It was constructed during the third quarter of the 4th century BC, was originally around 18.4 m tall, and guarded the entrance to the port (Hadjidaki, 1988). As the 1980s proceeded, we found the lower courses of more towers that had been part of the fortification walls forming a ring around the harbour (Frost & Hadjidaki, 1990; Hadjidaki, 2001). The new towers were rectangular in shape and, in addition to the *kymation*, the stones were decorated with drafted edges, *periteneia*.

As the years passed, more and more towers and other monumental structures were uncovered, all in the impressive style of elaborate Hellenistic public buildings. In the excavation seasons of 2015 to 2017, two new towers were uncovered. One of the towers adjoined the north-east fortifications of the harbour, and we refer to it as the North East Tower or Tower 4. This North East Tower guarded the northern quays thus protecting the most important part of Phalasarnian daily life – their ships and their cargoes. It has so far been excavated to a depth of three courses below modern ground level. A bottom



Figure 5. Base of Tower 4, showing carved moulding and entranceway. (Photo M. Bendon).

layer of headers is followed by a layer of stretchers and then by an uppermost layer of headers (Fig. 5). Its eastern side measures 7.9 m and its northern side 9 m. The stones measure up to 2 x 1.5 x 0.5 m, and the interior has a heavy rubble fill which provided good mechanical stability. We estimate that the height of the tower was approximately 18.4 m, with three chambers and three windows. An angled stone from the roof was recovered, indicating a pitched roof with gables. Stones from a crenellated parapet were also found. As in the case of previous towers, the stones had drafted edges and a large



Figure 6. Marble pediment from fill of Tower 4. (Photo M. Bendon).



Figure 7. Overview of Tower 7. (Photo Angelos Nakasis).

number of fragments from the *kymation* course were recovered scattered inside and around the collapsed structure.

One of the most impressive finds was lying inside the rubble fill. It belonged to a part of a carved marble pediment originally made for a large 5th-century-BC funerary monument (Fig. 6). The artistry shows obvious signs of Attic influence, and the pediment is likely to have come from an earlier funerary stele, which had been dismantled during the hasty 4th-century-BC construction of the tower. Thucydides describes this process concerning the Athenians in 478 BC, after the Persian defeat:

In this way the Athenians fortified their city in a very short time...many pillars taken from tombs and fragments of sculpture mixed in with the rest...sparing nothing.' (1.89.93)

This emphasizes that although the architectural remains we find today date from around 333 BC and later, this city-state had bloomed centuries before as an economic power with a rich artistic tradition.

The second tower is connected to the seaside fortifications at the south-western end of the port, and we refer to it as Tower 7 (Fig. 7). It is rectangular, measures 7.2 x 6.2 m, and was constructed directly on flattened bedrock from local sandstone. The interior of this tower, unlike the others, did not have an extensive rubble fill, but rather cross walls built of stones of varying sizes, with some rubble in between. The tower is the meeting point of two lines of fortifications – one that runs parallel to the coast and then encircles ancient quarries on the outskirts of the town, and one that heads straight towards the sea.

It seems doubtful that what we see today is the structure built on this spot in the 4th century BC. The construction is much rougher, the stones of varying sizes, and refined architectural features are missing. The overall dimensions are smaller than the other rectangular towers. A tower originally built on this spot may have been completely destroyed, and later hastily rebuilt from some of the remaining intact stones.

What this structure allows us to observe is the flattened bedrock that served as the foundation for the towers. This was observed in places for other towers where the rubble fill was removed, but it was not possible to see in its entirety. This tower will make it possible to study that feature of ancient engineering more completely.

Quays

The most convincing response to those who doubted the location of the harbour of Phalasarna was the discovery of three lines of stone quays surrounding the eastern side of the port. The first 17-m-long segments, called the northern quay, were found in the 1990s (Hadjidaki, 2001) and additional portions have been located in successive excavation seasons.

One of the new segments, the eastern quay, is 36 m long and was built on top of an earlier construction in a semi-circular shape reminiscent of an amphitheatre (Fig. 8). Three bollards protrude from this quay and have carved rectangular holes, unlike the northern quay where the bollards have round holes (Hadjidaki, 2015). Furthermore, the whole eastern quay was built at an elevation 0.5 m higher than the earlier northern quay, indicating that the sea-level in the 2nd century BC had risen, possibly due to subduction of western Crete (Pirazzoli *et al.*, 1992; Dominey-Howes *et al.*, 1999).



*Figure 8. Semi-circular quay.
(Photo Nike Marder).*

*Figure 9. North-east quay
with post hole. (Photo Koula
Borboudaki).*





Figure 10. Arrowhead inscribed with monograph BE. (Photo E. Hadjidaki).

The last section of the quays along the eastern side of the port was excavated in 2016 (Fig. 9). It is 10.5 m long and seems to have been connected to Tower 4 by means of a wall, still unexcavated. No bollards existed here, but five post holes were found in the seabed, near the foundations of the quay. Many copper nails, charcoal, and catapult stones with Roman numerals within the same stratigraphic layer, suggest the existence of a wooden platform perhaps burned by the Romans in 69 BC, when they destroyed the city of Phalasarna. The length of the wooden jetty must have been c.9-10 m. and its width 3.5 m.

Many bronze artefacts have been recovered from the ancient seabed at the base of the quays including arrow heads, coins, and nails. One arrowhead is inscribed with the monogram BE, of Queen Berenice II, wife of Ptolemy III Euergetes, possibly commemorating her marriage to the Egyptian king c.245 BC (Fig. 10)(Guarducci, 1939: 221-222; Sekunda, 2017: 88). Cretans were famous as mercenaries and archers; this arrowhead likely belonged to someone who served in the Ptolemaic army and brought it home. The profession of mercenary Cretan archers reached its peak during the Hellenistic period as they served the powerful Hellenistic kingdoms, but their reputation goes back centuries before.

Ceramic artefacts were also recovered from the same areas of the ancient seabed, many belonging to local and imported transport vessels from most of the Aegean wine production centres, such as the islands of Thasos, Samos, Chios, Kos, Rhodes, Skopelos, and Corcyra, as well as the coastal regions of the north Aegean, western Anatolia, south Italy, Sicily, and north Africa (Valle, 2015). This fact illustrates the breadth of Phalasarna's maritime trading network and gives support to the declaration found in an inscription of a peace treaty between Phalasarna and the strong neighbouring city-state Polyrrhenia that 'Phalasarna rules the seas' (Markoulaki, 2000).

Channel entrance and chain

Two artificially carved channels connected the harbour to the sea, one for the passage of ships, and the other for desilting. In 2015, we uncovered a pair of rock outcrops with holes carved in them near the main channel entrance. Because of the location of the stones and the configuration of the holes, we believe they constituted part of the mechanism for opening and closing the harbour. An attempt to explain the mechanism is illustrated in Figure 11: the chain comes from the channel, wraps around a groove and passes through a hole in the leftmost boulder, wraps around a groove in the second boulder, passes through a second hole, and from there winds around a thick vertical wooden pole, for which the socket is preserved. Green metallic residue is still visible

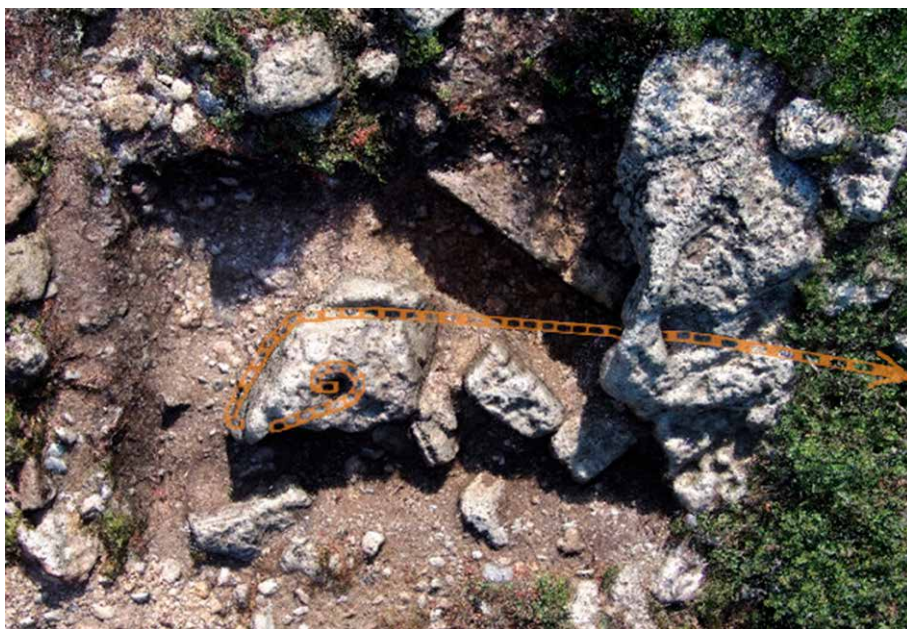


Figure 11. Rock outcrop carved to support the chain that closed the harbour. (Digital image, G. Liestøl and M. Marder).

within the grooves on the boulders. Whether the harbour was closed by a chain that could be lowered into the channel, or instead by a wooden gate that opened and closed, has not yet been determined.

Dock

Behind the military port to the north, separated by a wall, lies a smaller secondary basin. Pirazzoli *et al.* (1992) used carbon dating of organisms that live at the sea water's edge to determine sea-level over time. The story is complex; in 330 BC, when the currently existing harbour facilities were built, the harbour sea-level was around 5.5 m higher than present but rose gradually to 6.5 m higher than present by 365 AD, after which the sea dropped nearly to its current level during an enormous earthquake. The secondary basin was below sea level when the port was built, flat and ringed by walls, most of which are still unexcavated. Thus, we associated it with docking facilities and slipways. Part of a long, supporting sea wall was excavated in the 1990s that exhibited erosion and watermarks from the ancient sea-level (Hadjidaki, 2015).

Excavations in 2016 and 2017 uncovered the rest of the sea wall, which was constructed of blocks of uniform size and shape (isodomic style), 1.5 m high and 35 m long (Fig. 12). The south-eastern end of the wall adjoins a large stone structure which we believe to have been a slipway. The slipway is around 10 m long and 5 m wide at the base where it met the sea. The base would have been around half a metre under water in the Hellenistic period, but the structure slopes upwards at 13° so the top end was half a metre above the water. The slope is created by a series of broad steps; each of the stones that comprises it is laid flat. Wooden beams would have been laid on these steps to make them function as a slipway. A curious feature of the slipway is that it narrows as



Figure 12. Slipway and docking facility. (Photo E. Hadjidaki).



Figure 13. Sandstone pediment carved with Triton and a dolphin. (Photo E. Hadjidaki).

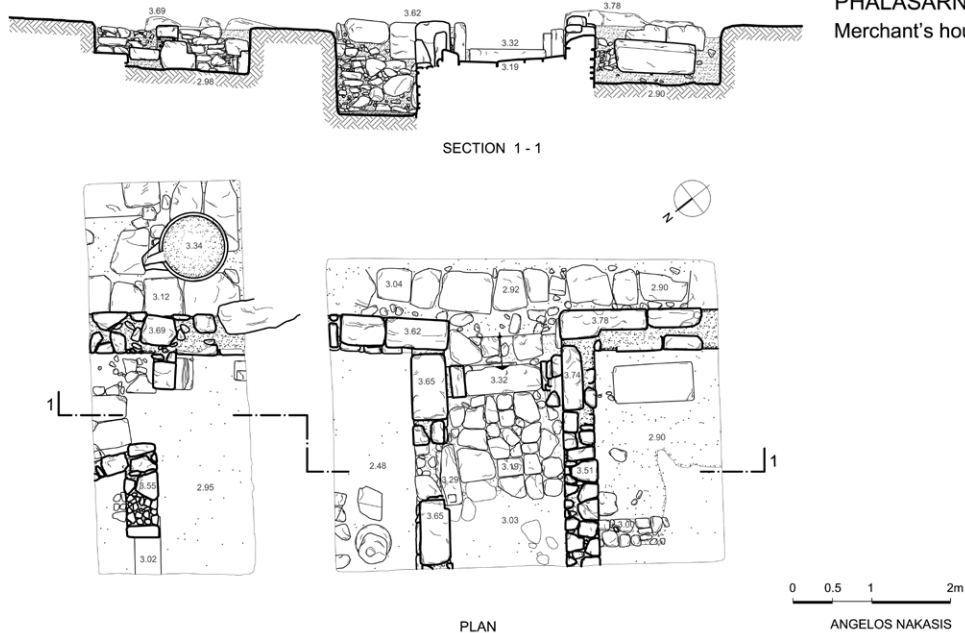


Figure 14. Plan of merchant's house. (Drawing A. Nakasis).

it goes up, and at the top it is only 2 m wide. It is not completely clear whether this was a feature of the original construction, or whether it is due to a wall being put down on it at an angle at a later period. Most indications are that this is the original construction, in which case the most likely explanation is that the prows of the ships would have fitted onto the slipway, allowing goods and passengers to be loaded and unloaded from the platforms on either side.

The slipway was deliberately covered with rubble at some point in antiquity, and on top of the rubble were tsunami deposits (Pirazzoli *et al.*, 1992), from within which in 2017, we excavated a magnificent sandstone pediment (Fig. 13). It measured $1.27 \times 0.87 \times 0.47$ m and the interior was carved with an image of Triton and a dolphin. It is an original piece dating to the 4th century BC, and it is likely it came from a nearby altar, the rest of which has yet to be found.

Merchant's house

In the summer of 2017 during an attempt to locate Tower 6, a building was uncovered on a slope near the channel entrance (Fig. 14). Excavation is still ongoing, but what has been uncovered so far suggests these were the living quarters of a rich merchant. The building comprised at least two rooms divided by a passageway, each more than 4 m in extent, with a paved courtyard. Among the artefacts recovered were a large stone mortar, a large press for wine or olive oil, over 20 bronze and silver coins, both local and foreign, three engraved rings, elegant tableware, large storage jars, and Phoenician stamped amphoras. Most of the finds date to the 4th and 3rd century BC, but it is likely that earlier material will be found in the deeper stratigraphic layers.

Situated simulation

In 2010, chance brought Gunnar Liestøl, a professor at the University of Oslo, as a tourist to Phalasarna. His specialty is situated simulations, which is a novel form of ‘mixed reality’ (Liestol & Morrison, 2013; Liestol & Hadjidaki, 2019). Using an iPhone or iPad, simulations are constructed that show a reconstruction of an area of a site that adjusts according to the orientation of the user, as if one had a window onto the past. To perform this task, the software makes use of all the cell phone sensors, including GPS, magnetometer, accelerometer, and gyroscope, plus video-game tools for realistic simulation. This technology was particularly interesting for Phalasarna, since the combination of Roman destruction and massive earthquakes in AD 66 and AD 365 makes the remains difficult for the casual visitor to understand (Pirazzoli *et al.*, 1992).

After years of exceptionally productive and respectful collaboration, a first release of a Phalasarna application is freely available on the Apple Store (Phalasarna, 2018). The simulation only opens and operates when a user is situated within the archaeological site, where it makes three historical layers available. The first layer shows the present, but with the addition of icons that a visitor can tap to hear a narration, as if from a virtual tour guide. The second layer provides a reconstruction of Phalasarna in 333 BC, when the harbour had just been built and the city was at its peak. The third layer shows the city in 69 BC surrounded by Roman soldiers, and includes a simulation of the Roman attack (Fig. 15).

I wonder how Frost would have reacted to this attempt to use technology to make Phalasarna comprehensible. She was one of the world’s earliest adopters of scuba diving technology, and her book *Under the Mediterranean*, published in 1963, was aimed squarely at a popular audience. However, she once told me that she took a rather dim view of her early efforts to communicate with a wider audience and dismissed it years later as a product of youthful ambition. So, on balance she most likely would have



Figure 15. Situated simulation showing virtual reconstruction of Roman attack on Phalasarna. (Digital image G. Liestøl).



Figure 16. Amphora mound from the Classical shipwreck at Alonnesos. (Photo S. Piskardelis).

scuffed at this method of presentation, which does not yet embody the same level of accuracy that is customary in the best academic work.

Underwater projects

During the 1990s, as the Director of the Department of Maritime Antiquities in Greece, I started excavating a large Classical shipwreck off the coast of Alonnesos, in the Aegean, that had a cargo of some 4000 amphoras (Hadjidaki, 1996; Fig. 16). Frost was the first to arrive at the site and excavated daily with me. The excavation of the Alonnesos ship was never finished, but nevertheless it taught the world that large ships carrying over 150 tons of cargo of wine, oil, pottery, and other products for export, were possible. History records ships carrying battle towers constructed in Athens in the 5th century BC called ‘*myrioforoi*’, which means that they carried a burden of 10,000 talents or 250 tons. We read in Thucydides (VII 25.6) that the Athenians used these ships in their naval assault against Syracuse’s forces during the Peloponnesian War, but we could not prove it. The Alonnesos shipwreck was a cargo ship, not a military vessel, but it leaves little doubt that ships of the size described by Thucydides were possible.

In 2005, I started excavating a Minoan shipwreck near the ancient harbour town of Pseira island in the Mirabello Bay, east Crete (Hadjidaki & Betancourt, 2006). Honor had been there many years before, participating in a 1955 survey of underwater remains together with a team from the British School in Athens (Leatham & Hood, 1959). She wrote an account in *Under the Mediterranean* (Frost, 1963: 103-104) and we often discussed her impressions of the collapsed sunken town that was lying on the seabed in this region. I never imagined during those discussions that years later I would return to Pseira, find and excavate the first-known Minoan shipwreck (Bonn-Muller, 2010).



Figure 17. Pseira amphora.
(Photo L.R. Martin).

The ship appeared to have capsized, and there were no wooden remains, which is not uncommon for prehistoric ships. However, the total of 140 ceramic transport vessels that we recovered make the largest collection for the Middle Minoan IIB period. The collection included 46 oval-mouthed amphorae, 41 spouted jugs, and 11 hole-mouthed jars, most of them homogeneous in type, fabric and date (Hadjidaki & Betancourt, 2006; Hadjidaki *et al.*, forthcoming) (Fig. 17). In addition, we found various vessels that belonged to the crew, such as 14 cups, three cooking tripods, ten stone tools, and fishing weights. We also found a rock-cut quay under water near the Pseira land site. Altogether, finds from the shipwreck and from the nearby shore confirm the existence of a daring society that sailed around northern Crete and across the Aegean, and built rock-cut harbour-works, as Honor always maintained. There is abundant evidence of Minoan trade with Egypt and the Levant (Watrous, 2005) and with western Anatolia (Betancourt, 2003). Thus, there can be little doubt that the Minoans constructed a fleet of ships that enabled them to connect extended domestic and international trading networks (Hadjidaki *et al.*, forthcoming).

Conclusions

Honor Frost did not measure what she did in terms of formal educational degrees or conventional recognition. She wanted a life of adventure and I never heard her express any interest in an academic position. Maybe this is why some academics did not fully accept her or her findings. But when it came to knowledge in the field, she was unmatched.

Each new generation has to make its own way. It can be difficult to recognize or appreciate the contributions of those who came before. But there is a right time for it, and this is the time for me to express my thanks and gratitude to the world's pioneering female diving archaeologist, a person who inspired me to study harbours and hunt for the first Minoan shipwreck. When the ship was found in 2005, she was already 88 years old, her health was failing and, despite her insistent desire to visit the wreck, I did not let her dive to see it as it lies at the depth of 45 m. Five years later, my mentor and my friend, Honor Frost, died, but she will live in my heart forever.

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