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PROTECTING THE CHORA: THE GREEK TOWER AT MASLINOVIK ON THE ADRIATIC ISLAND OF HVAR - EXCAVATIONS IN 1987, 2011-2012, AND 2016-2018

Abstract: The author reports on the six field seasons of excavations at the Greek isolated square tower on Maslinovik hill situated within the chora of Pharos on the Adriatic island of Hvar. After a brief history of research of the tower, its position and viewshed, attention is paid to the specific features of the building technique, stratigraphy, analysis of artefacts that were found (predominantly late 4th – early 3rd century BC), compared with other isolated towers in the Greek world, its price and symbolic function, as well as the city’s notion of its importance in the defence of their territory.

Keywords: Maslinovik, excavations, Greek tower, defence, Pharos, masonry, stratigraphy, pottery, tiles.

Introduction

Some 36 years ago, Petar Popović and I published the preliminary results of our excavations at the site of Maslinovik (Olive Grove), in which we rediscovered (after 111 years) the remains of a Greek isolated tower (Kirigin, Popović 1987)¹. Although some observations in our report had to be corrected, we highlighted in it that an isolated tower could also have formed part of a defence system that was established to protect the *chora* and *eschatia* of a Greek polis: in our case the Greek settlement of Pharos founded by the Parians from the Aegean island of Paros in 385/384 BC on the c. 700 NM distant island of Hvar, in the Adriatic Sea (for more details see Kirigin 2006). We were also the first to use viewsheds to demonstrate the existence of this defence network (Figure 1; Kirigin, Popović 1987: 180, 183, Figure 10.3), which was confirmed by GIS analysis in 1991 (Gaffney and Stančić 1991: 77-81). This method was later developed by scholars as “networks of intervisible tow-

ers used in surveillance and signalling” (Morris, Papadopoulos 2005: 162 and note 29). Petar and I have also shown that the tower at Maslinovik was a public investment whose purpose was to protect the *chora* of Pharos.

After our first excavation campaign in 1987, we had to wait 24 years for the next one. The turning point was in 2008, when Pharos and its *chora* were put on the UNESCO list of protected cultural landscapes (Čavić 2016). Three years later, the Croatian Ministry of Culture supported additional excavations in 2011-2012 (when Petar was with us), albeit with modest funding, and again in 2016-2018, for a total of 5 seasons of fieldwork. In 2019 it was decided (without consulting the excavation team) to stop the unfinished excavations and to begin a partial reconstruction of the tower².

Maslinovik is a rare, if not unique, example of a small site that has been excavated over so many decades and yet has not been satisfactorily investigated. The discontinuity of work has created many

¹ The first mention of the Maslinovik tower was not in 1897 by G. A. Botteri (as we have mentioned on p.177), but 21 years earlier (Anonymous 1876), most probably written by Botteri. The site code of Maslinovik is JE0120.00 (Gaffney et al. 1997: 143)

² This unexpected situation has enabled our small team to have time to properly tidy up the documentation and the finds that are held in the Stari Grad Museum. The results of the reconstruction work can be seen, thanks to the efforts of Eduard Visković, on this site: <https://sketchfab.com/3d-models/grcka-kula-na-maslinoviku-stari-grad-na-hvaru-2762cf8b715f4c3d8d0d9f384cc620bf>

problems and some features could not be explored properly and remain enigmatic. However, olives live for millennia even when they are neglected over a long period of time. Maybe the tower at Maslinovik will have the same fate and will end up being fully explored, protected, and presented to the public, and will become an exceptional attraction for visitors. Despite the incompleteness of this report, it is a great pleasure for me to contribute to the publication that celebrates the work Petar has done for archaeology and numismatics. After getting to know him during my student days from 1966, we have become close friends and shared many exciting archaeological field projects on the Dalmatian islands and all the turbulent and horrible days in our recent history.

As far as I know there is a large number of isolated towers in the Greek world, with a circular or a rectangular plan, although only a few examples in Greece have been excavated (Fachard 2016a: 83)³. While the literature on Greek isolated towers is quite extensive⁴, the total number of these fortifications is still unknown. What we have is data about individual or regional isolated towers⁵.

³ It was not possible for me to see all the papers that Fachard mentions, as well as some others that I could not get hold of.

⁴ Exhaustively presented and discussed by Morris, Papadopoulos 2005: 209-225 and by Fachard 2016a: 86-88; 2016b, 200 and note 57.

⁵ For example, on the border area between Attica and Beotia there are 10 square and 5 round towers (Champ 1991, 197, sl. 69); in southeast Attica around the silver mines (Laurion) there are 7 of them (Morris, Papadopoulos 2005: 176, Figure 20); around Mantinea in central Peloponnese there are 9 square towers (Maher, Mowat 2018); on the island of Leukas in the Ionian Sea there are 12 round and 7 square ones (Morris 2001: 290-291, 337-338 and Figure 1 on p. 286). The situation in Epirus (Molossia) is unclear. Nakas (2016: 426) mentions some 200 various Greek fortifications but does not classify them. On the island of Thasos (an archaic Parian settlement) to the north of the Aegean Sea there are 30 of them: 23 are square and 7 round (Osborne 1986: 166-167), while on the very island of Paros (the mother-city of Pharos) only one round is known (Haselberger 1978/3: 354-375). On the neighbouring island of Siphnos there are 40 round towers (Young 1956). See also: Fachard 2016b:220 and note 57.

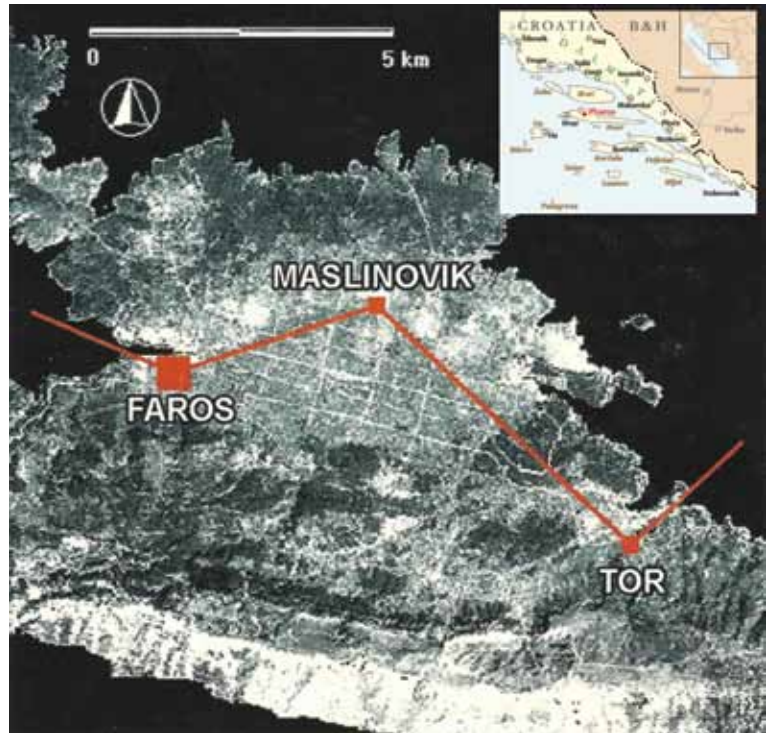


Fig. 1. Satellite image of the Stari Grad Plain with clear traces of the Greek land division. The red line indicates the visual communication between Pharos and the towers at Maslinovik and Tor.

From B. Kirigin 2003a and b, 21, Figure 16. Modified by B. Kirigin.

Isolated towers have been interpreted in various ways: they protected and kept under surveillance the borders of a *polis*, its agricultural or mining areas, roads and passes, and individual farms. Some towers also served as lighthouses. Most of them are dated to the 4th and 3rd centuries BC.

In what follows I will try to present the results of the excavations of the Maslinovik tower, the finds, and some observations about how it was built, its dating, and its functions in the Pharian community.

Position of the site

Maslinovik, at 66 masl, is situated in an Arcadian karstic landscape on the northern edge of the Stari Grad Plain, some 3 km as the crow flies north-east of Stari Grad town, the site of the Greek city of Pharos. The vegetation on the hill is sparse and mainly consists of various macchia, oak and wild olives. The hill is exposed to all winds. Various structures are located in the vicinity of the tower (Figure 2, no. 1). Some 10 m to the west there are the remains of a traditional



Fig. 2. Aerial view of the tower at Maslinovik and surrounding buildings made during excavations in 2017. 1. Tower, 2. Lime kiln, 3. Small drystone hut, 4. Drystone ramp. 5. Drystone house, 6. Station. Photo by E. Visković (numbers by B. Kirigin).

round drystone lime kiln c. 14 x 12 m and around 2-3 m high (Figure 2, no. 2). This kiln was built in late 19th/early 20th century and owned by the late Nikola Buratović - Rus from the village of Vrbanj, to which the area of Maslinovik and its environs belong administratively⁶. Tower blocks were built into its wall (one has a drafted edge). At some 2 m west of the south-western corner of the tower can be seen the ruins of a small rectangular shelter (c. 2 x 2m) used as a place of rest by workers at the

kiln (Figure 2, no 3). It is a drystone hut with a slanting roof made of typically thin irregular stone slabs supported by unworked wooden beams. Its northern side leans onto a drystone wall, a ramp, about 1-2 m wide (SU 38), also made of some larger tower blocks (Figure 2, no 4). This extends to the west for some 9 m. It was most likely built to make it easier to transport the tower's blocks towards the limestone kiln. Along the south face of the tower, at a distance of about 4 m, there is a rectangular dry-stone building, which was also owned by Nikola Buratović (Figure 2, no. 5). This could be a warehouse (now roofless, c. 5 x 4 m) with a door facing south; it was also built with some blocks from the tower. South of this is a smaller abandoned stone building (now roofless) built with mortar and with some large blocks, the so-called *stacija* (station), erected in 1899, which was part of an elaborate system for protecting the Stari Grad Plain from hail (Figure 2, no. 6). There was

⁶ This traditional drystone vault building (kiln) – *japjenica* in local dialect - was made out of limestone in which dry bush was set on fire continuously for, depending on the size, from five days to one month. Lime was made from the melted limestones. Our kiln could have produced some 30 tons of lime after 6 days of burning. According to Ivan Ljubić (born in 1941) from Vrbanj, the kiln was closed in 1905. It is very likely that the kiln was built after Botteri mentioned the tower in 1876. For the building technique of these kilns see: Zaninović 1980. For the history and method of making these rather complex kilns see: Blagajić and Burica 1990; Blagajić N. 2012; Blagajić M. 2012, and especially Puljak 2018.

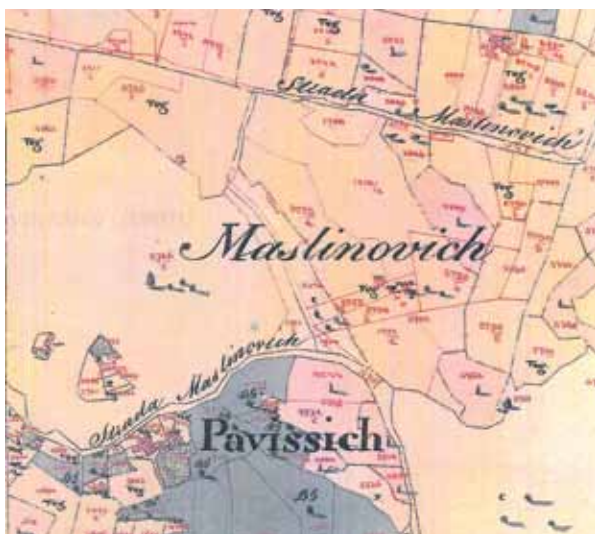


Fig. 3. Excerpt from the Imperial Austrian cadastral map from 1834. Courtesy of the State Archive in Split.

an anti-hail device in it (Moškateo 2008). In addition, there are smaller heaps of stones and dry-stone walls within this rocky terrain. A little further south, 50 m away, is the hamlet of Pavišići, which was established from the beginning of the 19th to the early 20th century (Figures 3 and 6). Among the buildings of this hamlet, one also finds blocks of the tower; one has a drafted edge.

To the south and west of Pavišići hamlet, all the way to the fields in the plain, are olive groves that probably gave the name to the hill. A Greek tombstone was accidentally found in 1905 at the site of Taveinac, at the south-western slope end of Maslinovik hill (Petrić 1998, 30, T. VI, no. 1). To the east is Škudljivac hill (74.7 masl), atop which lies a destroyed prehistoric mound (Vujnović et al. forthcoming). Somewhere nearby, the earliest hoard of Greek bronze coins, minted in Dalmatia in the 4th century BC, which still attracts lively attention (Goricke Lukić 2017 and references therein) was accidentally found in 1835.

A survey around the tower has shown that no other ancient structures were recorded indicating that the tower was an isolated building and not part of a farmstead or a place of refuge in case of danger (except if a timber enclosure was erected around the tower)⁷.

Access

The easiest access to the tower is from the west. When taking the old road from Stari Grad (Pharos) to Vrboska, the main W-E axis of the regular Greek land division system (For more details see: Slapšak 2002; Slapšak, Kirigin 2001; Popović 2020), towards the east for some 2 km, at the place of intersection of the two main axes of the land division (*omphalos*), one has to turn left and follow the road north for around 1.3 km, and then turn right where an upward path leads to the now abandoned hamlet of Pavišići (Figures 3 and 6). From there, to the left, after some 50 m, stands the tower, at a distance of c. 4.4 km from ancient Pharos. However, if one walks along the edges of the plain, the tower is at some 3.2 km from Pharos⁸, and as the crow flies it is 3.1 km from the city, less than an hour walking time.

Visibility

From the current height of the tower at 66 masl, one cannot see the sea towards the north or the bay of Stari Grad. On the south-western side, the southern part of Stari Grad town (the site of Pharos) is visible (Figures 1 and 4). Above Stari Grad and the village of Dol (Figure 4) is Purkin kuk at 275 masl (Figure 4), the site of the largest prehistoric mound on the island. The remains of a fortification/temple (?) have been incorporated into its western side. On the south side beyond the plain is the village of Vrbanj (Figure 5) below Hum hill (Figure 5), which also has a prehistoric mound, and the village of Vrisnik (Figure 5), to the rear of Vrbanj. At some distance to the east of Vrisnik is the bell tower of the village of Pitve (Figure 5). Further to the south-east is the hill on which the Greek tower Tor (235 masl) stands (Figure 1 and 5) above the town of Jelsa, some 7 km from Maslinovik as the crow flies. Behind Škudljivac to the east is Vetežnji hum with a prehistoric barrow (125.4 masl) and to the right is Tatinja hill (101.9 masl) also with a barrow. Some 3 km behind Tatinja is the Tor tower. Towards the north are the peaks (Vidova gora) and cliffs of the island of Brač (Figure 6) and the low hills north of Maslinovik encompassing the fertile area of Priloge (Figure 7), which was incorporated

⁷ On towers that form part of an enclosed area see Young 1956: 138; Fracchia 1985: 689; Morris, Papadopolous 2005: passim. Fortified Pharos was less than an hour's walk from Maslinovik.

⁸ Most of this path is visible. This could be a somewhat similar to the GIS suggested "least cost path across the cumulative coast surface between Maslinovik and the lower site of Pharos (Gaffney, Stančić 1991, 78-81, figures 50-52).



Fig. 4. View from Maslinovik tower towards Stari Grad from 10 m above the present ruins (2020). Inserted small photo is an enlarged image from the present level of the tower showing the positions of the churches in Stari Grad (2011).
Photos by E. Visković and B. Kirigin.



Fig. 5. View from Maslinovik from 10 m above the present ruins toward the tower at Tor with surrounding settlements (2020).
Photo by E. Visković (modified by B. Kirigin).

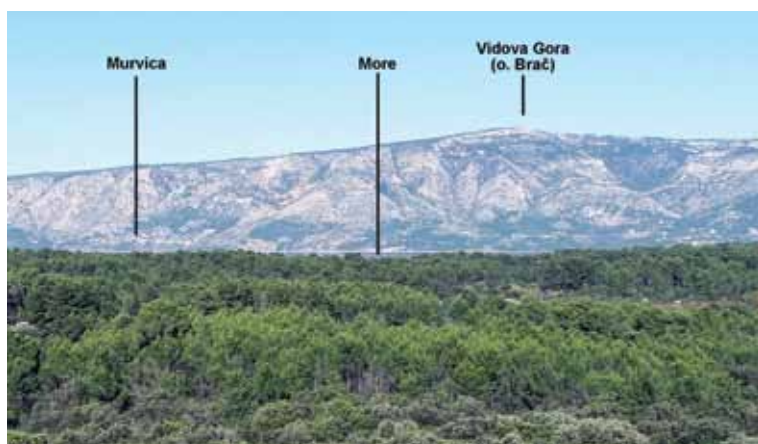


Fig. 6. View on the northern side of Maslinovik from 10 m above the present ruins showing the sea towards the island of Brač (2020). Photo by E. Visković (modified by B. Kirigin). (more = sea)

in the Greek land division system. Almost the entire Stari Grad Plain is visible from Maslinovik, Tor and Purkin kuk⁹.

In our case, visibility towards Stari Grad is especially important. From the current height of the Maslinovik tower, one can see the bell towers of the parish church of St. Stephen, and the monastery of St. Peter (whose bell tower, which stands at the highest southern point of the medieval city, probably lies on the foundations of a Greek tower). A little further south, one can see the church of St. Nicholas, which, according to oral tradition, was located in the middle of the ancient city¹⁰ (Figure 4).

One would think that the position of the tower would be better at a 10 m higher elevation on nearby Škudljivac hill, from where the view is wider, but from the latter spot any view of the Priloge area is not possible. One must keep in mind that the whole Stari Grad Plain was under cultivation, and without any fast-growing pine trees (*Pinus halepensis*), or macchia and oak trees, until 60 years ago. Predominantly pine and less so macchia now occupy 71% of the cultivated area, which encompasses some 1,200 ha (Andlar et al. 2018, : 4) Using a drone from an elevation of 10 m above the present level of the tower walls at Maslinovik, one can see a small area of sea on the north-western side to

⁹ The Greek style fortifications at Tor and Purkin kuk have been published by Zaninović (1978; 1981; 1982). I will address this subject in another paper.

¹⁰ Kirigin 1991: 14, no. 3 (based on an unpublished report by Mladen Nikolanci from 1968 in which this is mentioned). G. A. Botteri (1897) also writes: “È certo però che la *tradizione* colloca la Chiesa di San Nicolò nel bel centro dell’ *Antica Città*...”. See also: Kovačić 1994: 364 and note 27 with data from the 18th century; Popović: Devlahović 2018, 392.



Fig. 7. The northern part of the Greek regular land division with the position of the tower at Maslinovik and the site of Priloge.
Courtesy of Sara Popović.

wards Priloge and the island of Brač (Figure 6)¹¹. Even more could be seen if we eliminated the pine trees that are now at least 5-8 m high¹².

Orientation of the tower

The orientation of the tower is approximately in a N-S direction, with 12 degrees of deviation to the north-east, identical to the orientation of the regular Greek land division system that was laid down after the foundation of Pharos (Kirigin 2006: 88). The tower lies on the western side of plot D-18 of the regular Greek land division system (Figure 7)¹³. If this is not a coincidence, then the orientation of the tower and the land division system could have been planned and carried out concurrently.

The name of the tower

As was mentioned earlier, Maslinovik is the name for the hill, not of the tower at its top. If, by any chance, the tower had been preserved like Tor (*Turrium* in Latin, *Torre* in Italian) above Jelsa, it would certainly have been named. It is difficult to say when our tower became unrecognisable, but it is possible that it was already lost from view in Late Antiquity or in the Middle Ages (14th century) when today's toponyms in and around Stari Grad Plain were recorded (Kovačić 1993: 210). Yet, according to an anonymous writer, who said in his 1876 newspaper article (see note 1) that the wall of the tower at Maslinovik was 7.7 m tall (quite accurately), the tower must have been better preserved then when we partially rediscovered it 111 years later.

¹¹ The drone film from 10 and 12 m above the Maslinovik tower was made by Eduard Visković, an archaeologist from the town of Hvar. It will soon be available on YouTube.

¹² The above-mentioned Ivan Ljubić told us that when he was a child he could see the sea from Maslinovik, since there were no trees around.

¹³ These plots are not visible. This area most probably served as common pasture land: see: Popović 2020: 82.

Excavation results

Altogether, the excavated area covers some 10.5 x 10.5 m with an average depth of 1 m = i.e. some 90 m³. The excavations were not completed at parts of the lowest layers along the eastern, northern and western exterior faces of tower walls and also (deliberately) within the tower in the south-eastern quadrant (later SU 8 = the line between SU 2 and SU 1 on Figure 11) together with a smaller part along the northern interior side of the eastern wall (SU 15 on Figure 30).

According to the visible remains, the tower has collapsed mostly to the north-west and north-east, while for the southern side it is hard to tell as it is possible that the blocks from this side were taken away (*i.e.*, plundered) when all the nearby buildings, as well as the hamlet of Pavišići, were built. The preserved remains of the tower show an almost exact square measuring 7.55 (W) x 7.48 (N) x 7.48

on analogous isolated Greek towers, the tower on Maslinovik would have been at least 10 m high (see below). The preserved remains are only 10% of the original height of the tower. This is about a third of the height of the preserved remains of the similar tower at Tor above Jelsa¹⁴.

If we assume that the total length of the walls of our tower is 27 m and if we consider that they are preserved at a height of about 1 m, then we would be dealing with about 28 cubic meters of worked stone. If we assume that the tower was at least 10 m high, then about 270 cubic meters of stones were used to build the tower (not to mention the chips of the hewn blocks).

Excavations have shown that the walls of the tower were built on bedrock that is slightly sloping to the north-east. It is not completely flat or smooth, but has a lot of cracks, recesses, depressions and holes typical for the karstic landscape (Figure 9). What is interesting is that most of these

recesses within the tower, about 20 cm or more deep, have rounded edges (Figure 10). They are full of fine dark brown soil and some smaller stones (SU 0 = 24). At the bottom along the interior of the eastern wall in the SI quadrant there is a layer of horizontally placed thin white irregular stones with rounded edges mixed with dark brown soil that are put in a somewhat semi-circular shape (SU 15, Figures 10 and 30). These differ from the direction of the surrounding bedrock (SU 0 = 24). Two blocks of the eastern wall (SU 7) lay over them (Figure 10).

A similar situation is found in Pocket A (SU 11) along the eastern profile of the south-western quad-

rant and along the interior side of the southern wall (SU 4), with similar stones within dark brown soil (Džep A on Figure 11). On a higher level of this dark brown soil 33 sherds of prehistoric pottery (most probably Bronze Age) were discovered (see below). It is difficult to determine how these irregular thin white flat and rounded pieces of stone were formed. They look as if water has

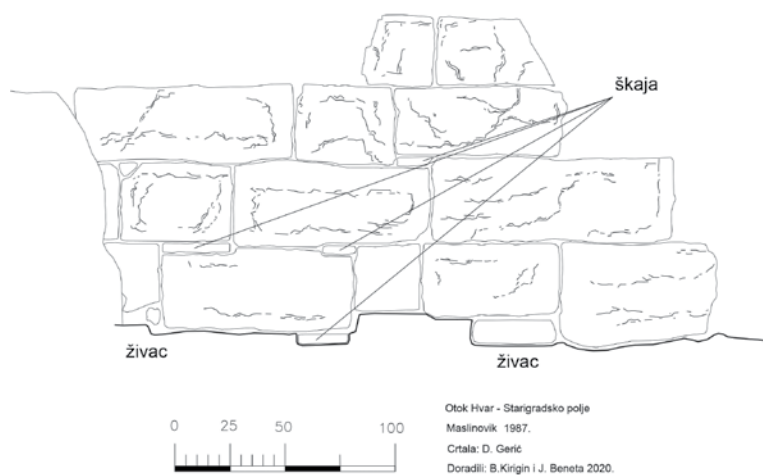


Fig. 8. Western part of the northern wall of the tower. Produced by Dunja Gerić in 1987, published in Kirigin and Popović 1988, 181, Figure 101 above; Kirigin and Olujić 2011, 692, modified by B. Kirigin in 2020, redrawn by Jasmína Beneta. (živac = bedrock)

(E) x 7.53 (S) m on the exterior face. The highest preserved height is about 1.5 m – the north-western angle - with 4 rows of blocks (Figure 8) and the lowest in one row at the inside northern face. The width of the wall is about 1.1 m, and the inside measures 5.5 x 5.5 m (= 30.25 m²). If we were to convert this into Greek measurements, that is to the foot measure of Pharos (= 30.21 cm) (Stančić, Slapšak 1987: 194), then the length of the exterior wall face could be 22 feet, the interior 18, and the wall width about 3.3 feet. Apparently, based

¹⁴ Estimated height to be from 6.3 m on the southern and 8 m on the northern side (Zaninović 1978-1979: 205-206; 1982: 63). These heights include the restored 5 layers of blocks.



Fig. 9. The bedrock within the tower. Photo by P. Popović (2011).



Fig. 10. The north-eastern square within the tower showing the bedrock and the eastern tower wall built on SU 15. Photo by P. Popović (2011).

been washing over them for a long time. The bedrock at the bottom of the southern trench (SU 24), as well as the southern part of the eastern wall, is flat and similar to the above-mentioned features. It is possible that here we have “boundaries” of two geological limestone formations¹⁵.

There are very rare signs that the bedrock was levelled out (hewn) for adjusting the first row of the tower blocks (Figure 8). It looks as if most of the blocks were adapted to the bedrock and at the north-western and south-eastern corners a stone socle was used (Figure 8 and 19).

¹⁵ Unfortunately, because of insufficient funding, we did not perform any palaeobotanical analysis to see what kind of vegetation existed before the tower was built. However, this kind of study is still feasible.

The interior of the tower

The course of research

After the exterior and interior edges of the western part of the southern and the interior face of the eastern wall of the tower were defined in 1987, the surface layer of soil, stones, bushes and grass, thicker on the western side, was removed in the same year. It also contained recent pottery (late 19th / early 20th century), mostly smaller fragments of Greek tiles, 4 animal bones (phalanx) and, in the deeper part, some burnt stones and scattered Greek tile sherds. These tiles appear in the north-eastern part of the quadrant, from which it appears that the fallen tower blocks were removed at some point. The northern part of the interior seems to have been mostly devastated in recent times, in some places to the bedrock (SU 18 on Figure 11). In the north-eastern part, a skeleton of a large animal (donkey?) was found below the surface layer together with recent pottery and Greek tile sherds. These animal remains were above a layer of smaller stones placed on the bedrock. In the north-western part of the interior the situation is similar. The area has experienced recent excavations (of tower blocks?) and

backfills so there are no traces of the cultural layer (later SU 2 and 25) that was found in the southern parts of the tower (Figures 11 and 13).

In the north-western part beneath the layer of humus there is a layer of small and large stones that were lying on the bedrock. Many small fragments of tiles were found in this stone layer - 107 in total (SU 18). Tiles were also found along the narrow and shallow ditch that was excavated in 1987 to define the exterior line of the northern wall and especially near the southern wall. Within the tower, in the subsurface layer, 185 tile fragments were found (Figure 15) together with 21 daub fragments with no traces of straw, which may represent remains of a clay floor and some remains of an oven (?) (Figure 13a).

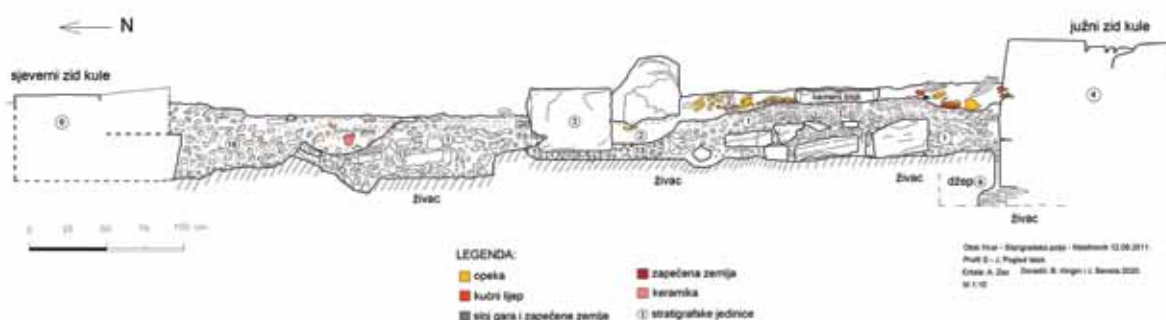


Fig. 11. The north-south section of the interior of the central part of the tower. Drawn by Asja Zec in 2011. a. surface layer from 1987. b. cultural layer excavated in 1987 (hypothetical reconstruction), modified by B. Kirigin, redrawn by J. Beneta.



Fig. 12. The start of the field season on Oct. 31st 1987. Team members Irena Radić, Petar Popović, Zoran Stančić and B. Kirigin, after cleaning the western tower wall, revealed the letter $\Phi = \text{Ph(aros)}$. Photo by Vinko Šribar.

cross-section: it is 10 cm wide and 20 cm long (Figures 11, 13, 14 and 28). On the eastern side of the central block there were several smaller blocks of stones in a vertical position that probably increased the stability of the square block on that side. The second larger dislodged and broken block of the tower was located on the western side of the square block, while next to the southern side of the square block there is a larger, also dislodged, whole block of the tower (Figures 11, 13 and 14). It could be seen that there was a pit around the square block (SU 20) into which the centre block was inserted (Figures 11 and 17, no. 1) Underneath this block

fragments of sea shells (*Murex brandaris*) were found.

After removing the surface layer within the interior of the tower, its southern, eastern and northern walls were completely defined. Almost all of them were preserved, more or less, at the same height. On the north-eastern, south-eastern and south-western exterior corners of the tower, drafted edges exist, while on the north-western corner a block with a drafted edge appeared during excavations. Under the surface layer a stone block with a finely worked top surface (50 x 50 x 40 cm) was discovered (SU 3), located in the very centre of the tower and in the centre of the diagonals (Figures 13, 14 and 17 no. 1). Around this nearly square block, on the southern side, are three larger dislodged tower blocks. On the southern side, a fallen (or shifted) block from the tower wall leaned on the square block, its western edge rests on the south-eastern tip of the square block. On the southern side of this block is a carved groove with a square

Beneath the surface layer (Figure 12) in most of the southern part there is a thicker cultural layer (Figure 11, no. 2) composed of compact brown soil mixed with small and large reddish daub, oven (?) fragments (Figure 13a), with many fragments of Greek tiles, course and fine wares and same small stones. Here, most of the tile sherds were found in a horizontal position (Figure 15). Within this layer, but not everywhere, is a dark area, in some places 10-15 cm thick, with traces of soot, possibly a burned wooden floor beam (?) (Figure 13), fragments of baked red clay (some are burnt on one side), tiles, an amphora, a few fragments of course and fine pottery (all in various positions), and a small bronze nail (Catalogue no. 79). In this layer the tile sherds are in various positions and are small. This layer overlies a layer of compact

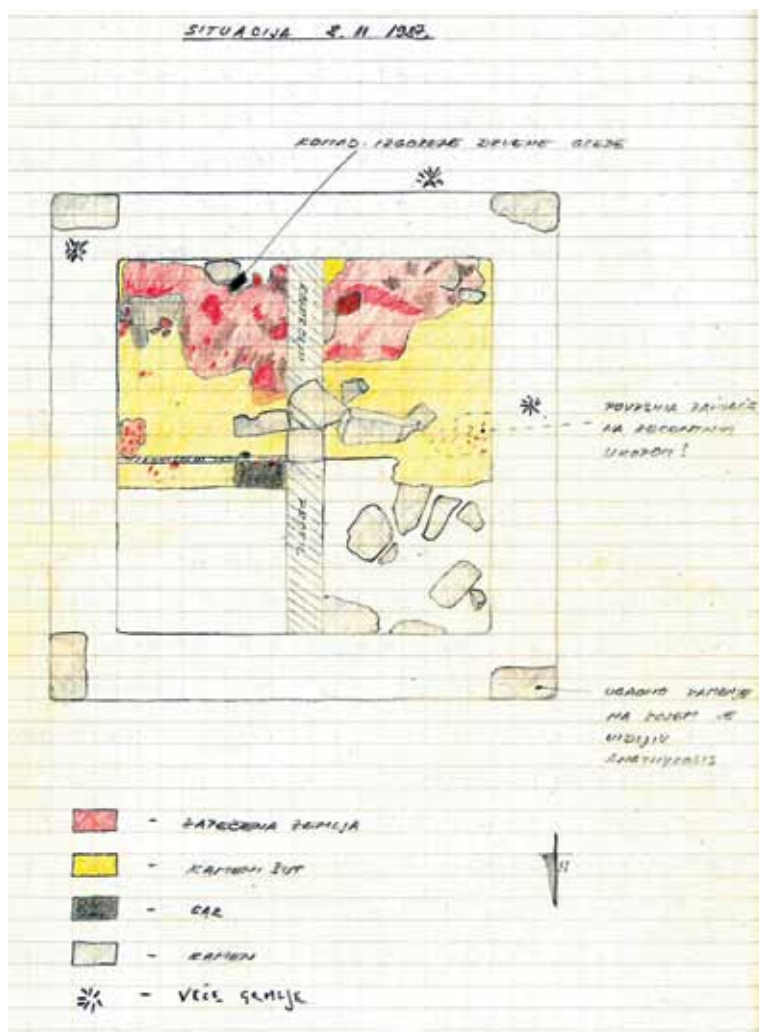


Fig. 13. Sketch by Irena Radić from the diary of excavations in 1987. Arrow indicating the position of the burned wooden beam. Daub and fired clay in red, stone rubble in yellow, burned layer in black, stones in grey. Small crossed lines for bush trees.



Fig. 13a. A large part of a ceramic object. Catalogue no 75a. Photo by B. Kirigin.

smaller stones that are spread all the way to the edges of the interior tower walls (SU 8) (Figure 13, in yellow). The surface has a dark appearance, resulting from burning.

On the sketched plan of the tower from 8th November 1987. (Figure 13) and the aerial pho-

to from the same year (Figure 14), the distribution of red burned soil/clay (floor and maybe an oven), the burned (ash) layers, bedrock in the north-western part, the central square block and the fallen blocks around it, the layer of smaller stones (in yellow), and the N-S section can be seen (see Figure 11 for details)¹⁶. The distribution of finds (except tiles) found in 1987 can be seen on Figure 16¹⁷.

Further excavations within the tower took place in 2011, 24 years later. The whole western part of the interior as well as the north-eastern quarter were excavated to bedrock, leaving the 0.5 m wide N-S section (Figure 9 and 13) and most of the south-eastern quarter untouched. It was confirmed that that the central block was not placed on bedrock but on a thick layer of crushed sea shells (*volak/volci* in Croatian, *Murex brandaris* or *Bolinus brandaris* in Latin) mixed with smaller stones (SU 13), all laying on bedrock¹⁸ (Figures 11 and 17, no. 1). Also, the pit (SU 20) made for the placement of the central block that was dug into the layer of small and large irregular stones (SU 1=8), which rest on bedrock, became more evident. The surface of SU 1=8 is of small thin sharp-edged stones that have a dark appearance, a result of burning.

An amphora body sherd was found lying on it (Figure 17, no. 2), as well as some other sherds noticed in 1987 in the south-eastern quadrant (Figure 16). This surface of stones in some places consists of patches of encrusted lumps forming a compact mass of stones mixed with small crumbs of lime, probably because of weathering (SU 30). These

¹⁶ The burnt beam and wood, together with 11 samples of daub were taken to Ljubljana University in 1987 but all of them were subsequently lost.

¹⁷ The south-eastern quadrant within the tower was covered with plastic foil in 1987.

¹⁸ The central block was not removed during our excavations. The top surface is finely chiselled, clearly showing its square shape. The vertical sides are roughly trimmed especially on the northern side. The height of the block is 40 cm.



Fig. 14. Aerial photo from 1987 excavations. North towards top.
Photo by Vinko Šribar.



Fig. 15. Layer with tiles in the southern part of the interior of the tower from excavations in 1987. View from the north-east. Photo by Vinko Šribar.

encrusted lumps were formed before the soil layer came above it, otherwise the lumps would have soil within them that would prevent the water from flowing away. It is conceivable that these lumps were thrown here when the levelling of the interior of the tower was made and when the pit (SU

20) was dug in the centre for placing the central square block on a layer of crushed murex shells (SU 13)¹⁹. It is possible that the central square block (SU 3) was placed at the point from which all the measurements were taken for the positions of the tower walls. When this was done, and after the filling of the levelling layer of stones (SU 1) (Figure 11), the pit (SU 19 and 20) was dug to place the central block. The murex shells probably have some symbolic meaning, like in many cases when the building of structures started (Figures 11 and 17, no. 1). The composition of SU 1 allowed the water to run away from the tower basement and kept it dry.

There is a puzzling feature along the interior side of the southern wall. It looks like a semi-circular depression c. 1 m in diameter slanting towards the southern tower wall (Figure 17, no. 3). It was formed of irregular flat stone blocks some 10 cm thick (SU 29). It looks like these blocks were once the pavement of the ground floor. A few similar blocks were found within the southern half of the tower's interior (Figure 11). The layer around SU 29 is SU 1=8 (a fill of small and large stones) and the layer in it is SU 2 (soil with a few tiles, an amphora, CW and FW pottery, and daub). SU 29 overlies a layer of looser dark soil mixed with small stones (SU 8). It is hard to tell whether this depression was made for some purpose (to hold a pithos where water was collected and stored²⁰) or whether it was a result of natural sinking.

It is very possible that fire was responsible for the destruction of the tower. This can be traced, if I am correct, by looking at the surface layer of small stones that

¹⁹ Smaller murex shells were found complete.

²⁰ As Ober has suggested at the round tower (F) of Vathychoria (Ober 1987: 593, Figure 27, C). Body sherds of three different pithoi were found at Maslinovik (see below).

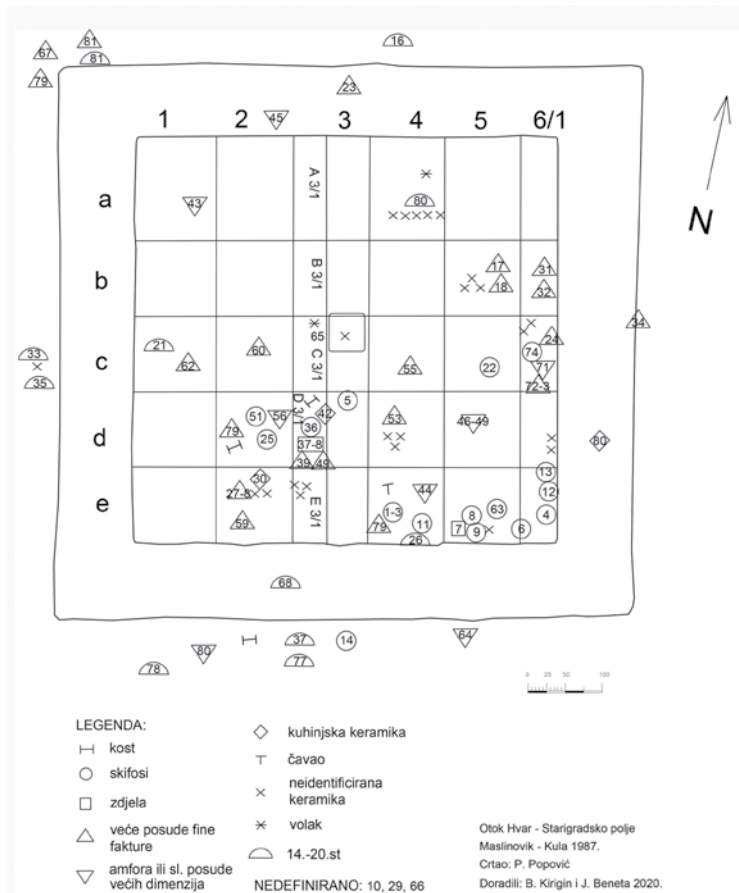


Fig. 16. Sketch of tower plan with position of finds (except tiles). Lines within the tower are 1x1 m grid squares. Made by P. Popović in 1987, redrawn by J. Beneta in 2020.

formed the basement level of the tower (SU 1). This layer was first covered with a burned layer (SU 8) and of fallen wooden interior floors and beams, pottery, tiles, daub and the clay oven (?) (SU 2 and 25) (Figures 13-15, 17, no. 2, no. 2-3). SU 25 may have been thicker as it could have been partly removed when the tower blocks were taken away to be used as spolia in various nearby structures, as can be seen by numerous finds in SU 23

in the trench along the southern wall (Figure 19). Also, the layer of tower blocks within the tower could have fallen on SU 2 later, during the abandonment of the tower. The surface layer could have been formed from the period when the removal of the tower blocks came to an end at the beginning of the 20th century, when the lime kiln was closed. Thus, the layers with mostly Greek tiles in the southern trench (surface and SU 23) could represent the period when the removal of blocks was at its greatest (in the 19th and early 20th century).

Trenches around the tower walls

In 1987, before the excavations of the interior of the tower, a shallow and narrow trench was dug along the exterior face of all the tower walls. A wider area was excavated at the north-western corner of the tower.

Southern trench

Along the southern wall (SU 4) a large number of Greek roof tiles were found in 1987. In 2011, a trench of 7.5 x 1.5 m was laid out and only the surface layer consisting of small stones and dark soil was excavated (SU 12 = 22). It contained small and large stones, dark soil and roots. At the upper part of this SU plenty of sherds of late 19th/early 20th century AD coarse cooking and glazed wares were recorded, while fewer of these were found in the lower part of this layer.



Figure 17. No. 1. View from the north at the central block (SU3): 1. SU1(8). 2. Plastic cover from 1987. 3. 1987 fill. 4. SU20. 5. SU3. 6. SU13. 7. Bedrock. No. 2. Type B amphora body sherd (yellow clay) on SU 8 in the south-eastern quadrant of the tower's interior. To the right is SU 29 (see Figure 18a). Photo: B. Kirigin (2016). No. 3. Depression next to the inner side of the southern tower wall. 1. SU 29, 2. SU 8, 3. SU 2, 4. SU 4. Photo (2012) and numbers (2021) by B. Kirigin.



Fig. 18. View on the tower from the south-eastern side and at the eastern part of the trench along the southern wall.
Photo by P. Popović (2012).

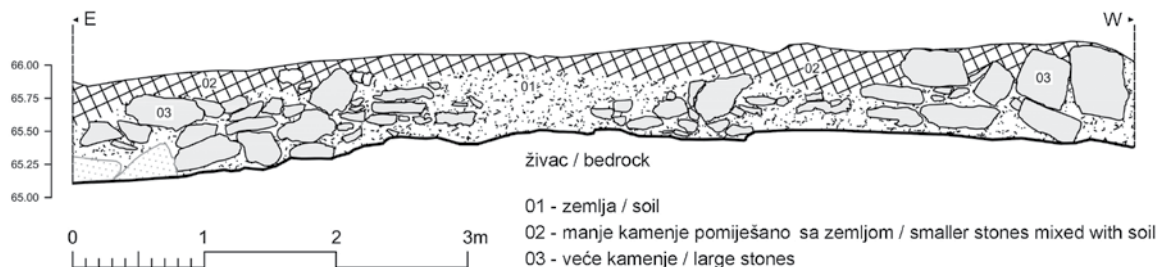


Fig. 19. Southern section of the trench along the southern wall. Made by Andrea Devlahović (2013).

In addition, some Greek tiles were found (Figure 19, no, 02) (Kirigin, Olujić 2012: 593) In 2012 and 2017, the whole trench was excavated to bedrock, which appeared at a depth of c. 0.8 m (Figures 18 and 19). The trench was divided into two parts, separated by a 0.5 m wide profile corresponding to the S-N profile in the interior of the tower (Figure 20). Below SU 22 is a thicker layer (SU 23) of dark soil, some bigger blocks of the tower walls and many Greek tile sherds, as well as Greek amphorae, plain and coarse, and a few fine wares, some 40 kg together (Figure 19, nos. 01 and 03). Only 4 recent pot sherds were found in this SU. Below SU 23 is the bedrock (SU 24), which consists of flat cracked limestone (some have polished

edges) with dark soil and roots. Pottery and tile sherds from SU 23 were found on the surface of this SU. A circular piece of bronze of 15 by 14 mm in size (3.17 g) with traces of a dotted border and flat smooth sides and an oblique edge was found in this layer (Figure 21). It could be a flan of an unstruck coin of the Pharian mint of the 4th century BC (For similar size and weight see Brunšmid 1898 [1998]: 41 no. 2; Bonačić Mandinić 2004: 64 no. 103).

Eastern trench

The southern part of this trench along the eastern wall (SU 7) was excavated in 2016 and the northern part, which was a bit on a higher level, in



Fig. 20. The central section in trench along the southern wall from the east. Photo by P. Popović (2012) SU layers marked by B. Kirigin (2020).



Fig. 21. Circular piece of bronze from SU 23. Catalogue no. 78a. Photo by Tonči Sesar (2013).

2017. It has the same dimensions as the southern trench. The stratigraphy is basically the same as in the southern trench, but with many fewer finds and less soil. In the northern part of the trench there are more fallen tower blocks appearing from the surface to the bedrock, which – because of their weight and the lack of a crane – prevented us from excavating the trench all the way to the bedrock (Figure 22, nos. 1 and 4; Figure 23).

Northern trench

In 1987 the western part of the exterior of the northern wall (SU 6) was excavated to the bedrock, mainly to find the north-western corner of the tower and to see how deep the bedrock was (Figure 8). The eastern part was excavated in 2017 and the central part in 2018 (Figures 22, no. 2; 23). The surface layer produced a few tile sherds. Below it is the same situation as along the eastern wall, with large fallen tower blocks and soil that is of a lighter colour and a few tile and pottery sherds and many roots from the nearby wild olive tree that fill the space between the tower blocks (here SU 33 = 23 in the south and 28 in the east). The finds consist of small amounts of tile fragments, mostly concentrated in the central part, fragments of amphorae, coarse and fine wares, house daub, seashells and animal bones, contaminated with a few modern pottery sherds.



Fig. 22, No. 1. View of the tower from the north-east and the trench along the eastern wall. Photo by Ivana Protulpec (2017). No. 2. View from the south of the trench along the eastern wall. Photo by Ivana Protulpec (2017). No. 3. View from the east of the trench along the northern wall. Photo by Ivana Protulpec (2017). No. 4. View from the north of the western wall with Igor Dužević and Nikša Vujnović in front. Photo by Ivana Protulpec (2018). No. 5. Petar Popović documenting the western tower wall in 1987. Photo by Zdravko Fističić.

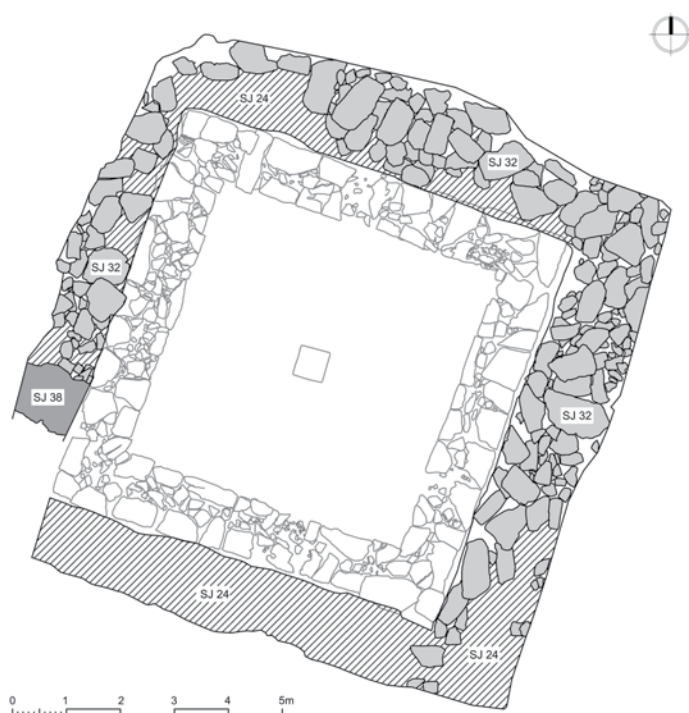


Fig. 23. All trenches around the tower after excavations.
Made by Andrea Devlahović (2019).

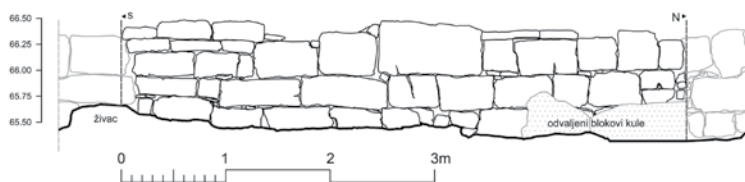


Fig. 24. Interior face of the western tower wall. Made by Andrea Devlahović (2019). (Odvajljeni blokovi kule = dislocated tower blocks). See also Kirigin and Popović 1988, 181, Figure 10.1 below.

Western trench

Most of the northern part of this trench along the western tower wall (SU 5) was excavated in 1987 (Figure 22, nos. 3 and 5), and the rest of it in 2018. What is characteristic is that underneath the surface layer, layer SU 34 differs from SU 33 on the northern side and looks like a fill that was contaminated with modern material (Fig. 2 no 4; SU 38 on Figure 23). In the deeper levels of this trench, together with standard Greek ceramics, a few body sherds of prehistoric pottery were found, the only ones found outside the tower. Near the southern end of this trench there is a uniface face south-facing drystone wall, using some tower blocks, that runs toward the lime kiln in the west (SU 38 on Figure 23; Figure 2, no. 4), partly incorporating the drystone hut described above (Figure

2, no. 3).

The very south-western corner has the lowest cornerstone with a drafted edge preserved (Figure 25, no. 1). It is slightly sloping towards the SSW. This happened, presumably, in recent times during the construction of the drystone hut built 2 m from the western wall of the tower (Figure 2, no. 3). While constructing this shelter, at one point the builders obviously had to remove some of the blocks along the south-western corner of the tower (Figure 25, no. 3). Then they pulled out not a block, but a part of the bedrock on which the lowest block of the tower was placed (Figure 25, no. 2). In order to prevent the corner block of the tower from collapsing into the recess below it, they stacked slab stones against it (Figure 25, no. 5). The original builders of the tower would never have done this, as it would have been too risky. They would have found a better solution. The corner block is massive; its dimensions on the southern side are 90 x 44 cm.

The exterior and the interior face of the walls of the tower

The tower was built using two types of limestones. One is a foliate type found on the surface or near it, and the other is a hard, compact type dug from deeper subsurface layers. The quarry was obviously nearby, most likely on the western side of the tower towards the lime-kiln. Foliate blocks were used only to build the walls, while compact, higher quality blocks were used for the exterior corner blocks (as well as the central block SU 3), but not for the interior angle one. The exterior corner blocks, usually more massive than the blocks in the walls of the tower, have drafted edges (often referred to as *anathyrosis*, *peritenia* or *kyphros*; in our local Dalmatian dialect *špigul*) (Figures 8 and 25, no. 1). The upper surface of these blocks was flat, so as to fit well with the next similar corner block that was above it. The drafted edge served



Fig. 25. The south-western corner seen from the west. 1. The corner block with drafted edge. 2. Bedrock. 3. Dislocated tower block. 4. Stacked slab stones. 5. Dark soil with recent pottery. Photo by B. Kirigin (2020).

the builders as they were the first ones to be placed in the position of the corners of the tower, separated by 7.5 m on each side. After that, the rectangular and trapezoid blocks of the wall were laid between these corner blocks²¹. The next row of blocks proceeded in this way too. The drafted edge helped to ensure the vertical line of the corners was always consistent (90 degrees)²². With the help of a plumbline, one could easily see that the edges fit the proper vertical line of the tower corner. In this way, the builders were sure that the blocks would not slip out and cause the tower to collapse. By doing this the statics of the tower would not be disturbed. In some places, as is the case at the south-eastern and north-western corners, the lowest corner blocks, due to the shape of the terrain, are in fact stone socles that are more prominent outwards than the main line of the tower, and parallel

²¹ This drystone building technique was in use in Dalmatia until recently: Bubalo, Frangeš, Šrajer 2016: 68.

²² This was told to me by the stonemason Ivica Stipičić - Cigo who carried out the restoration work at the tower in 2019. He has excellent knowledge of traditional stone building techniques. The same was observed by Yannis Pikoulas, who has studied the isolated towers in Agrolid, Arkadia and Laconia: "Pikoulas suggests that these drafted joints would have served as "guides" for the architects, presumably to ensure that the critical corner blocks did not shift when the courses of irregular polygonal blocks were laid": quoted from Maher, Mowat 2018: 479.

to the southern and northern walls of the tower and stretch out about 20 cm (Figures 8 and 18). There is no drafted edge on these blocks. These were most likely placed to make sure that the upper block with the drafted edge would not, due to the slope of the terrain or a gap in the bedrock, "fly out"²³.

In the walls of the tower, both on the outside and on the inside (Figure 24), the blocks are arranged in rows that are sometimes not completely horizontal and of the same height (the isodomic style). In order to obtain the same level between blocks that are not of the same height along their entire length, the lower block would be hewn or a smaller rectangular stone block would be inserted. These are called, in our local Dalmatian dialect, *škaja*, *škaica* or

kunj, as the professional stone mason Ivica Stipičić – Cigo from Brač told us (Figure 8)

The shapes of the blocks are most likely dictated by the layers of stone in the quarry. The upper and lower surfaces are in most cases flat, especially in the case of the corner blocks. The exterior face of the block is not specially worked while the rear faces of the blocks are in most cases left unfinished. Sometimes, the blocks at the ends would be carved so that they could better receive the side or upper block. This was most likely caused by the fact that no long layer of stone of the same height could be found in the quarry that would give the same height to all the blocks. The longest block to be seen in the tower is 128 x 38 cm (the western exterior face). The longest and the highest block is on the interior face of the western wall, measuring 100 x 50 cm (Figure 24). This method of masonry with different heights of blocks trying to obtain the same level is called the pseudo-isodomic style. It is possible that this method required less work. The face of the walls consists mainly of properly carved rectangles or trapezoids, of various lengths, but not always of the same height. Only the face of

²³ It is estimated that to make one corner block a stonemason would need 1 day of work. If the tower was 10 m high then 120 corner blocks would have been made by one stonemason in 4 months (information: Ivica Stipičić - Cigo).

the block was roughly worked, while more attention was paid to the upper, lower and side surfaces. In any case, care had to be taken that the blocks fit well on all sides since the tower was at least 10 m high (as will be discussed below). Invisible to the eye, the internal appearance of the blocks is irregular and, in most cases, untreated (Figures 14 and 30). The longest block of the tower wall is on the inside face of the southern wall, measuring 130 x 30 cm.

The core between the exterior and interior face of the tower walls

In several places on the surface of the tower walls as well as along the exterior face of the tower there were trunks and roots of various trees, primarily of spruces whose roots crept into the walls and decomposed and crushed the stones, especially on the preserved surface. It was very difficult to get rid of them because, surprisingly, inside the tower there is a lot of quality soil and clay that attracted the roots. This made it difficult to determine the true appearance of the core between the exterior and interior faces of the tower, that is, whether it was some kind of fill or that the blocks that belonged to the interior and exterior face of the walls, over time, cracked and were filled with soil and roots. However, we found that in the case of our tower, the technique of randomly inserting small irregular stones into the interior between two faces – a technique often, but incorrectly, called *emplekton* (Pedersen 2019) – was not used.

The internal appearance of the blocks of our tower is not regular, that is, they are not square in shape, as is the case with the construction of the foundations of Greek temples or more important buildings (Pedersen 2019). These are intertwined blocks whose interior parts, unlike the exterior face, are not cut or finely worked (Figures 14 and 30). Therefore, for the strength of the overall structure, suitable carved stones or suitably shaped ones were added between them in order to fill the surface space of each row of blocks, the so-called *škaca* in the local language. Since the blocks between the exterior corners of the tower are made of leafy limestone and have cracked over time due to the action of vegetation (spruce roots, holm oak trees, etc.) and the penetration of soil (humus) that we found when we first began excavating (and for

quite a long time struggled with the roots of these trees), it is possible that the blocks simply cracked and look like they represent some sort of fill of smaller stones. In addition, the space between the blocks was filled with moist reddish soil, which further strengthened the structure of the building²⁴. After we cleaned the surface of the tower walls, we could get the impression that in some places it looked like the builders had filled smaller untreated stones into the core of the wall (Figures 14 and 30). However, these are not two separate walls that are joined by some kind of fill (like some of the walls of Roman fortifications or other wider walls: *opus incertum*). Also, on our tower we have “binders” in some places, oblong not very regular or almost triangular blocks that make up both faces of the tower walls (Figure 14 and 30). Such finely cut blocks are called *diatonoi* (Pedersen 2019: 2). Therefore, the building technique used for the tower at Maslinovik could be called pseudo-*emplekton*. When cleaning the surfaces of the walls, the space between the blocks as well as the face of the tower, we did not find any fragments of ancient pottery deliberately inserted into the wall matrix²⁵.

The evidence indicates (at least to me) that after the building of the first two rows of tower walls, the interior of the tower was filled in with SU 1²⁶. The central square block is a unique feature among the isolated Greek towers known to date. Thus, it is hard to interpret its function as well as why it was laid at all and why on SU 13 and not on the bedrock that is almost flat or easy to level? One might think that it was meant to be a base for a wooden pier that would support the wooden floor of the tower where heavier things had to be placed (pithoi, amphora, oven (see below), things for maintaining the tower and other equipment necessary for the guardians of the tower - *chorophilakes*.

²⁴ Good quality impermeable pinkish soil/clay is found at the nearby natural pond in Dračevica within the Stari Grad Plain. When exposed to sun, the clay becomes dust. During rainy days it absorbs moisture and stops water and moisture from entering the interior of a building.

²⁵ Potsherds used in this way have been found during excavations of the walls of Pharos (Katić 2000: 127, sl. 29).

²⁶ Due to the finds of prehistoric sherds below SU1 it was thought that SU1 might represent the remains of a barrow, as similar ones are found on the surrounding hills around the Stari Grad Plain (Kirigin 2006, 14, Figure 8), but it was found that SU1 is not present outside the tower walls while in the inside it is clear that it is a fill.



Fig. 26. Dislocated tower block with a square slot. Photo by B. Kirigin (2018)

Tower height

Considering the number of blocks around the tower and those dismantled for spolia in various surrounding buildings, it can be said with some certainty that the entire tower was built of stone blocks²⁷, and that the roof was made of flat tiles - the so-called Corinthian type (Figure 28 and Pl. 6 and 7), and polygonal and curved tiles - the so-called Laconian type cover tiles (Pl. 8, nos. 70-72). Based on the width of the tower walls and analogies with other isolated towers in the Greek world (e.g., Mazi and Vathychoria in western Attica or Poros on the island of Leukas) it can be assumed that the tower could have been about 10 to 12 m high, the exact height cannot be determined but it was certainly more than 7.5 m high²⁸. If we assume that the square stone block in the middle of the interior of the tower served as a base for a wooden pier for the first tower floor (which is quite probable but for which we have no comparanda), then the tower certainly had one floor. As the area inside the tower measures about 25 m², parts of it had to be reserved for housing, event cooking, and space for food and

water, rest and equipment for the garrison. If it was necessary to guard the *chora* for 24 hours, then the garrison had to consist of 4-5 people. It is possible, if there was a door on the ground floor, that the space was intended as a stable for keeping a mule, donkey or a horse, while on the first floor there was a kitchen and a place for storing food. Above that a dormitory, and above it a covered attic look-out space. This would mean that the tower had a ground floor and three floors connected with wooden ladders (fixed and/or removable). Thus, the height of the tower could have been between 10 and 12 m. The tower must have been high enough to be seen clearly from Pharos (Figure

4), at a distance of some 3 km as the crow flies, as well as from Tor (Figure 6), at a distance of some 7.2 km as the crow flies.

Excavations have shown that there are no traces of a door on the ground level, which some towers have (Ober 1987: 592, Figure 26, 594, Figure 28). Thus, the function of the ground floor is not clear. The absence of a door on the ground floor could indicate that the door was on the level of the first floor, a feature also known among isolated Greek towers²⁹. If this was the case, then our tower was accessed via a removable wooden ladder. Among the dismantled blocks outside the tower there is a broken part of a block that has a square slot (20 x 20 cm and 3-3.5 cm deep) that could have been part of a door jamb (Figure 26) (For a similar one see: Morris and Papadopoulou 2005: 188 and Figure 21). The tower must have had windows (or similar openings) to illuminate the interior and to get fresh air. No lintels were found, nor lamps. If the ground floor did not have a window, does this mean that the ground floor of the tower was not in use, or was used in special situations (protecting valuables)?

²⁷ As is the case at the tower of Tor and elsewhere in the Greek world. Regarding the isolated towers that protected the territory of Mantinea, the upper parts of the towers were built using bricks. It is estimated that these towers were 8 m high (Maher and Mowat 2018, 479-484).

²⁸ Fachard 2016b, 220 states, based on Ginouvès (1998, 24) "By definition a tower is a rectangular, square or round construction, the height of which is distinctly greater than its width or diameter".

²⁹ For example, Agia Marina on Keos (Morris, Papadopoulou 2005 158, Figure 4, and 190 for two other towers). During the reconstruction of the tower at Tor, a doorway was made on the level of the first floor. It is not known whether the doorway was here in the first place. Old photographs do not support the existence of a doorway on the southern side.



Fig. 27. Dislocated fragmented of tower block with a carved groove of a square cross-section, 10 cm wide and 20 cm long (the place where it was found is on Figure 13). Photo by B. Kirigin (2016).

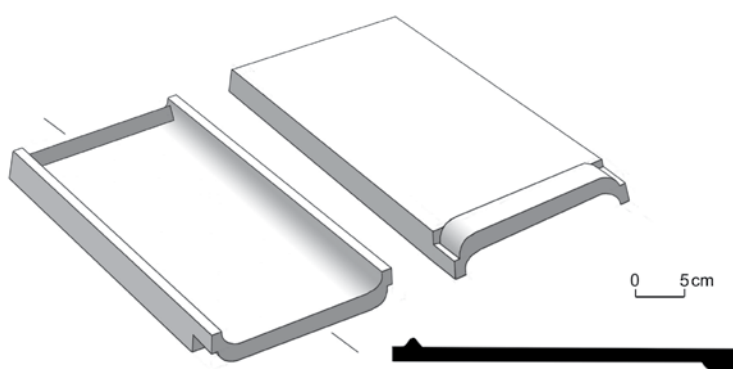


Fig. 28. Hypothetical reconstruction of a flat roof tile from Maslinovik made by P. Popović in 1987, redrawn by the late Zoran Podrug (2021).

The floors and the roof

Only one big chunk of a burned beam was found (Figure 13), next to undefined large and small fragments of charcoal (now lost). Whether it is a floor or a roof beam is not possible to say. The only other evidence is the abovementioned block with a carved groove of a square cross-section, 10 cm wide and 20 cm long (Figures 13, 14 and 27). No other architectural elements for floor or roof beams that formed part of the tower construction were recorded. To bridge the 5.5 m space the floor beams had to be 6.5 m long as they had to be inserted into the tower walls at least 0.5 m. The beams were most probably made from local hewn pine trees (*pinus nigra* or *pinus halepensis*) that had a cross-section of 16 x 14 cm, and had to age for at least one year before use. These beams would carry a floor without the support of a central pier from below, otherwise they could be of c. 12 x 12 cm which is similar to the space on the carved groove on Fig. 27. In SU 23 (trench along the southern wall) five fragments of large very rusty nails were found (Pl. 8, nos. 79-80).

Due to the abundant number of sherds of tiles (mostly flat tiles) found within and around the tower, in 1987 it was estimated that there are some 5 m² of flat tiles and some 3-4 more were recovered during later excavations, it is evident that the tower had a pitched roof covered with tiles. Still, it is unknown whether the roof sloped on one side, two or four sides. This is mainly because we have found altogether not more than 8-9 m² of tile sherds and not a single one that we could wholly complete (Figure 28). Rare preserved whole flat roof tiles – in shape identical to our ones – come from the neighbouring Greek settlement of Issa on the island of Vis. It measures 66 x 52 cm and weighs 15.2 kg³⁰. According to my estimates, the flat tiles from Pharos are of 10 kg, and 3 tiles are c. equal to 1 m². Therefore, if we had a roof with one sloping side (for rainwater runoff) one would need c. 180 tiles (2.736 kg or 2.052 kg) and roof beams to cover an area of some 64 m². If the tower had two slanting sides then to cover 78 m², c. 235 tiles would be needed (3.500 kg or 2.625 kg) with more roof beams. If the tower had four slanting sides, to cover c. 62 m², some 187 tiles (2.842 kg or 2.131 kg) would be needed and even more roof beams would be employed. A roof with four slanting sides is the most complicated type of roof to construct. If the roof was covered on one sloping side (for rainwater runoff) then it would have had an area of about 64 m³¹. As we have only c. 8-9 m² of preserved roof tiles and we did not find any tile that was cut to fit oblique joint side of a four sided slanting roof, and we also did not find any stone blocks that were cut to fit two slanting roof sides, it is not possible

³⁰ These measures are based on Greek tiles that were used in grave 90 at the necropolis of Vlaško njiva at Issa, dated to the late 4th/early 3rd century BC (Ugarković 2019, 44-46). These are by shape and size almost identical to those produced in Pharos (Kirigin, in preparation). For the weight calculation of 15.2 kg of the tile from Issa, I am grateful to my colleague Boris Čargo.

³¹ For these measures, I am grateful to Meludin Kadrić – Braço, construction contractor from Hvar.

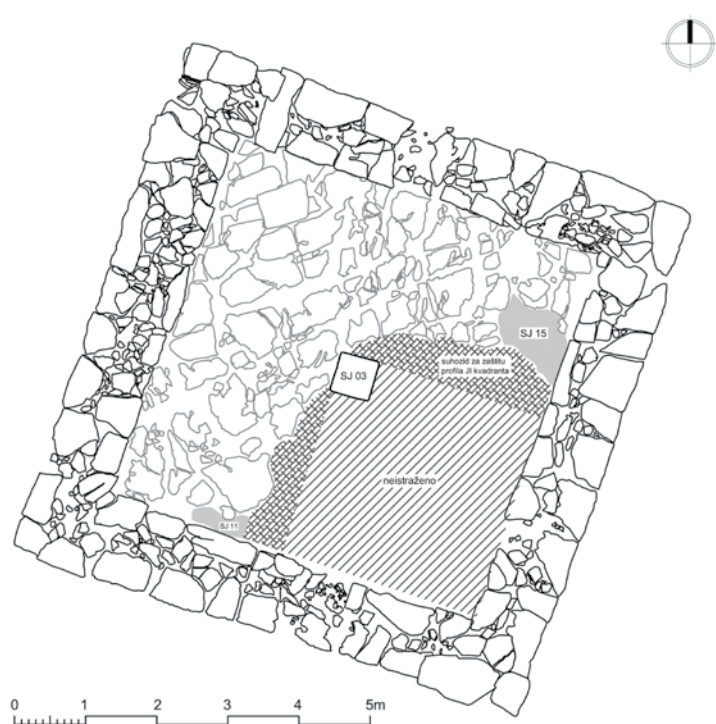


Fig. 29. Plan of the tower interior with the position of unexcavated south-eastern square (hatched), our drystone wall that protects the western and northern sections (reticulated), and positions of SU 11 and 15. Made by Andra Devlahović (2019).

to say what kind of a roof we had at our tower³². Aside from the mentioned iron nail, no metal fittings (clamps) were found that would join the roof or floor beams. The hypothetical reconstruction of the roof for the signal towers around Mantinea (Maher, Mowat 2018: 484, Figure 18) seems not to stand due to the weight of the tiles and the force of the wind. To me it looks more likely that the uppermost story, the attic of the tower, had larger windows on all sides that could be closed with shutters (Ober 1987: 577, Figure 8, 603, Figure 31) depending from what side the wind blew. Above it, a tile roof of whatever shape stood. Also, it is not known if the roof was used to collect rain water. Fragments of pithoi and amphorae indicate that water was stored, but whether it was brought to the tower or if a water collection system existed within the tower like at the tower at Vathychoria in Magaris (Ober 1987: 591-594, Figure 27 C) remains unknown. The presence of natural springs or of a cistern in the broader area around Maslinovik has not been recorded.

³² According to Ober's reconstructions of some artillery towers on fortification walls, they have two-sided slanting roofs and windows (Ober 1987: Figures 5, 14, 16, 30).

Surface finds around the tower

In an area of some 50 m around the tower, only a few Greek pottery or tile sherds (c. 20) were recorded, mostly near the southern and western parts of the tower.

Date of the tower

No simultaneous or later adaptations or buildings can be seen in or around the tower. There is no evidence that it was part of some enclosure or a farmstead. Its isolation indicates that the function of the tower was not modified for the same or some other purpose (except that it has been used as a source of stone since the late 19th to the early 20th century AD). It, therefore, functioned for a limited period, which, according to archaeological finds, can be dated from the mid-4th to

mid/late 3rd century BC (predominant number of finds). From the 2nd century BC there are only a few sherds: one amphora neck and 4-5 sherds of fine grey clay wares (Pl. 2, no. 25), and from the Roman period there are also only a few fine ware sherds. One belongs to the Early Roman period (Pl. 2, no 27a) and two belong to the Late Roman period (Pl. 2, no. 29; Pl. 3, no. 29; Pl. 8, no. 76) (see below under Finds).

Price of the tower

Morris and Papadopoulos (2005: 155, 164) state that the round tower of Cheimarrou on the island of Naxos (near Paros), which had an original height of 53 rows of blocks, about 15 m (and is preserved at a height of 42 rows today), was 9.2 m in diameter and had a 70 cm thick wall, with a brick roof, cost 8,000 drachmas. At that time, a construction worker in Athens received a daily wage of 1 drachma. Such a wage met the minimum needs of a family (Franke 1999: 59-60). If the tower at Maslinovik was 1/3 smaller than the tower of Cheimarrou, then the price of Maslinovik tower would be c. 5,340 drachmas. If the Athenian daily

wage were transferred to Pharos, then it would have taken 15 construction workers about a year to build a tower on Maslinovik, and 30 workers could have built it in about half a year³³. In any case, it was a large investment that the city had made to secure their protection.

Comparisons with the neighbouring Adriatic and Balkan areas

Fortifications of Greek and Hellenistic masonry have been recorded at several sites along the north-eastern Adriatic coast, from Uljein (Olkinion) in Montenegro in the south to Osor (Apsorus) on Cres in Croatia to the north. Some 45 years ago, Aleksandra Faber published the first comprehensive study of these fortifications (Faber 1976), based mainly on a sequence of masonry styles. However, this approach is unreliable, as has recently been pointed out (Frederiksen 2011: 63-65; Maher 2017: 41-43). The problem is that there have been no modern stratigraphic excavations at these sites, and even if there are some similarities in masonry, the conclusions are arbitrary, especially if there are no context analyses of excavation finds and historical arguments. A striking example comes from the recent excavations at Pharos, where the presumed city walls, which used to be dated to the early 4th century BC (a dating that I myself once supported), have been proved to have been built in the late 3rd/early 2nd century BC. This wall was built of reused block of the original early 4th century BC fortification walls that have still not been found *in situ*. (Popović, Devlahović 2018).

Many fortified sites in north-western Greece and in Albania were also built in a pseudo-isodomic manner. Yannis Nakas has mentioned that there are 153 fortified settlements, forts, blockade walls and towers in ancient Epirus (southern Albania and north-western Greece) and that only very “few studies of their architecture, topography and history have been undertaken” (Nakas 2018: 426-427). Unfortunately, this is true for northern

Albania as well (Ceka 2008, Dausse 2008, Nakas 2016, Bogdani 2020 (summary on Academia.edu); Sphuza 2020).

The Ionian islands towers at Leukas (Morris 2001) and Kephallénia are among those that have been studied in more detail. The closest masonry analogies can be found in Randsborg’s classification of masonry stiles on Kephallénia, within his group D in which types of wall nos. 19-22 are built using the drystone technique from worked trapezoidal blocks of unequal sizes, built in a pseudo-isodomic style (Randsborg 2002: 232-245). This very detailed classification based on the findings on the island of Kephallénia is supported by numerous examples from other parts of Greece, especially from Epirus and Attica: the walls of the Pleuron and Thermon fortifications in Aetolia and Thorikos in Attica, dated between c. 425 and 200 BC (Randsborg 2002: 232-238, 251-253; 2014). From what can be seen in the illustrated examples, these walls do not use small rectangular blocks (our so-called *škaja*, Figure 8) that fill the gaps between the heights of the larger blocks³⁴, which is a relatively common case at the tower at Maslinovik, but is seen less often at the Tor tower (Zaninović 1978/1979: Figures 3-5, 7), as well as in the fortification wall of Issa (the Greek settlement on the neighbouring island of Vis) (Kirigin and Marin 1985: 55-56, Figure 9; Kirigin and Marin 1988: 137, Tav. 29, 2), at Tragurion (modern Trogir) (Kovačić 2002, 387, Figure 5) and Epetion (modern Stobreč) (Neuhauser et al. 2014 and Figure 9), both on the mainland near Split. None of these fortification walls have yet been reliably dated. Also, in Kephallénia, as well as on Leukas, the walls seem to have only one face, i.e., they were built with one row of blocks (Randsborg 2002, 256; Morris 2001), which also seems to be the case with other isolated towers in Greece. Therefore, our two isolated towers would, for now, be unique examples.

Comparanda: Sicily and Southern Italy

It is tempting to think that the Syracusans who helped the Parians to establish Pharos also helped them to build the fortifications, especially bearing in mind the impressive fortifications that Dionysius

³³ This calculation lacks the price for the mason, scaffolding to build the tower, equipment, time for quarrying and preparing the blocks, etc. According to master Ivica Stipičić – Cigo, who, in 2019, carried out partial reconstruction work on the tower of Maslinovik, it would take 6 men (a master and his assistant and 4 workers) in ideal conditions (without using modern tools and devices) 2 years to quarry and prepare the stone, and build the tower.

³⁴ These appear on the tower at Agia Marina on the Aegean island of Kea (Keos): Morris, Papadopoulos 2005, 158, Figure 4.



Fig. 30. No. 1. Petar Popović analysing the roof tiles from Maslinovik at the church of St. Marko in Hvar town, 1987. No. 2. Pithoi body sherd nos. 41 (above left), 42 (bottom left) and 43 (right). No. 3. B type amphora handle with impressed stamp (no. 54 in catalogue). No. 4. Cover tile fragment from the 1987 excavations.

the Elder made during his reign, particularly at Syracuse³⁵. However, as was mentioned earlier, the tower at Maslinovik was most probably built after the Syracusans had left the island. No similar isolated towers (of whatever function) are known to me from Southern Italy or Sicily (Sconfienza 2005; Pope 2014; Mertens and Beste 2018; Visonà 2019 (but see Visonà 2016 re. Contrada Palazzo di Cittanova); Jonasch 2020).

Symbolic function of towers

If we agree that the tall towers on Maslinovik and Tor had the function of protecting valuable agricultural resources from field fires that could endanger the harvest, and from possible pirate or other seaborne attacks and lootings, and that they were built bearing in mind the conflict that erupted a year after the founding of Pharos (385/4 BC) and after the withdrawal of the Syracusans, who helped the Parians to defeat the Illyrians, we can

³⁵ Diodorus Siculus book XIV, 18, 2-5; XVIII, 8; Mertens, Beste 2018: 11-15. For the possibility that the Syracusan fleet wintered at Pharos, see Kirigin 2006: 67 note 98.

also assume they certainly had other functions, too. Thus, for example, by their very appearance (monumentality and their dominance in the landscape), they could have projected a sense of security for the inhabitants of Pharos and those who worked in the fields and used the space belonging to the city. The towers were landmarks and orientation points that could be seen from everywhere: Tor has effective control of the eastern maritime approaches to the *chora* and Maslinovik is seen from everywhere within the *chora*. They could also have fostered the notion of belonging to a community among the settlers and evoked a sense that the *polis* was looking after them and the wealth they produced. The towers also proclaimed the supremacy of the city over the surrounding indigenous population, very well presented by Müth (2020). We can, therefore, assume that the towers did not have

to be very high, but that it was important that they be visible. One does not need towers to send a warning by fire, smoke or sound³⁶.

The finds

Prehistoric pottery

Most of the prehistoric sherds (46 of them) were found in the lowest SU 15 and in SU 11 (36), both near the bedrock, while in SU 34 (12) and in SU 8, 10, 18 and 25 one or two were found. Altogether, we have some 104 sherds (583 gr), although only 2 can be recognised: a rim and a handle (PL. 1, 1-2). It looks like there are two types of pots, a large and

³⁶ Regarding smoke signals, there is an interesting example from the mid-20th century AD from the nearby island of Brač. When the people of Pučišća (a village on the northern coast facing the mainland) had completed the work on the limekiln and “When the lime kiln was burned down, we would make a great fire, whose smoke signal would be visible all the way to Mimica (some 3.2 NM from the mainland, or 7 km, like from Tor to Maslinovik). This represented the sign for the shipowner to start the journey towards our dock. And he would also respond with a smoke signal. Signalling that he was starting the journey” Puljak 2018: 70.

a small one. Three fabrics can be distinguished: **1.** Dark brown clay with tiny, unevenly distributed holes on the surface, **2.** Dark brown clay with an ochre yellowish surface, and **3.** Dark brown clay with calcite grits. One of these has a polished surface. They all appear to be from the Bronze Age. Although it is difficult to explain their presence, it is possible that a barrow existed here, as they do on all the hills around the Stari Grad Plain (Kirigin 2004: 25-35, 264, Pl. 4, B.; Kirigin 2006: 12-22, Figure 8 on p. 14).

Greek pottery

The earliest FW pots (skyphos, larger pot, two bowls and a lekanis (nos. 3, 13, 14, 16 and 17), due to their pinkish clay and a slightly higher quality black gloss (BG), could be the earliest among the finds, but not earlier than the mid-4th century BC. The skyphoi ring foot (profiled and round) and rim sherds (all everted), or their fabrics, do not support the idea that they might be from the first half of the 4th century BC³⁷. More likely is that they are from the second half of the 4th and possibly even the early 3rd century BC (Ugarković 2019, 85-8, Figure 108, with updated bibliography. The skyphoi with everted rims from Gravina are dated c. 335-300 BC (Prag 1992: 117-121). A similar dating can be applied to the painted Alto-Adriatico style sherds (Pl. 1, no. 11 and 12), which can also be dated to the second half of the 4th and early 3rd century BC (Ugarković 2019, 67-70, with updated bibliography).

Amphorae

Some 105 sherds of amphorae have been recorded. Of these, there are sherds of 13 rims, 12 handles, 4 toes and 76 body sherds.

Rims: 1 is pinkish, 9 are light pinkish-brown and 2 are of yellow clay (two joined). All are of the type B amphora (Pl. 4, nos. 47-52).

Handles: 1 red and 10 light pinkish-brown (not joined) and 1 ochre. All are flattened oval shape in section. One is almost complete (Pl. 5, no. 53) and one has a stamp with the Greek letter Σ (Fig. 30, no. 2). This stamp is known on type B amphorae dated to the late 4th and early 3rd century BC. The most similar to ours is Koehler's no. 431 from

Corfu, dated to the late 4th century BC, which has the stamp on the base of the handle (Koehler 1979, 249-250. See also her other Σ stamp nos. 424-436 on pp 248-251, all similarly dated), while ours is on the shoulder.

Bases: One yellow and three light pinkish-brown (Catalogue nos. 56-59). The moulding of the bases is different. One (no. 56) has an elaborated groove at the beginning of the toe, one less elaborate (no. 57) and on two (nos. 56 and 57) the groove is hardly visible.

Some of the 76 body sherds may also belong to larger table amphorae. One would expect more amphorae body sherds, as is the case at Pharos (Kirigin 2018).

The treatment of the rims, the longer vertical arch handles and the piriform body indicate the 4th and 3rd century BC (Koehler 1979: 183-205; Koehler 1992)³⁸.

Pithoi

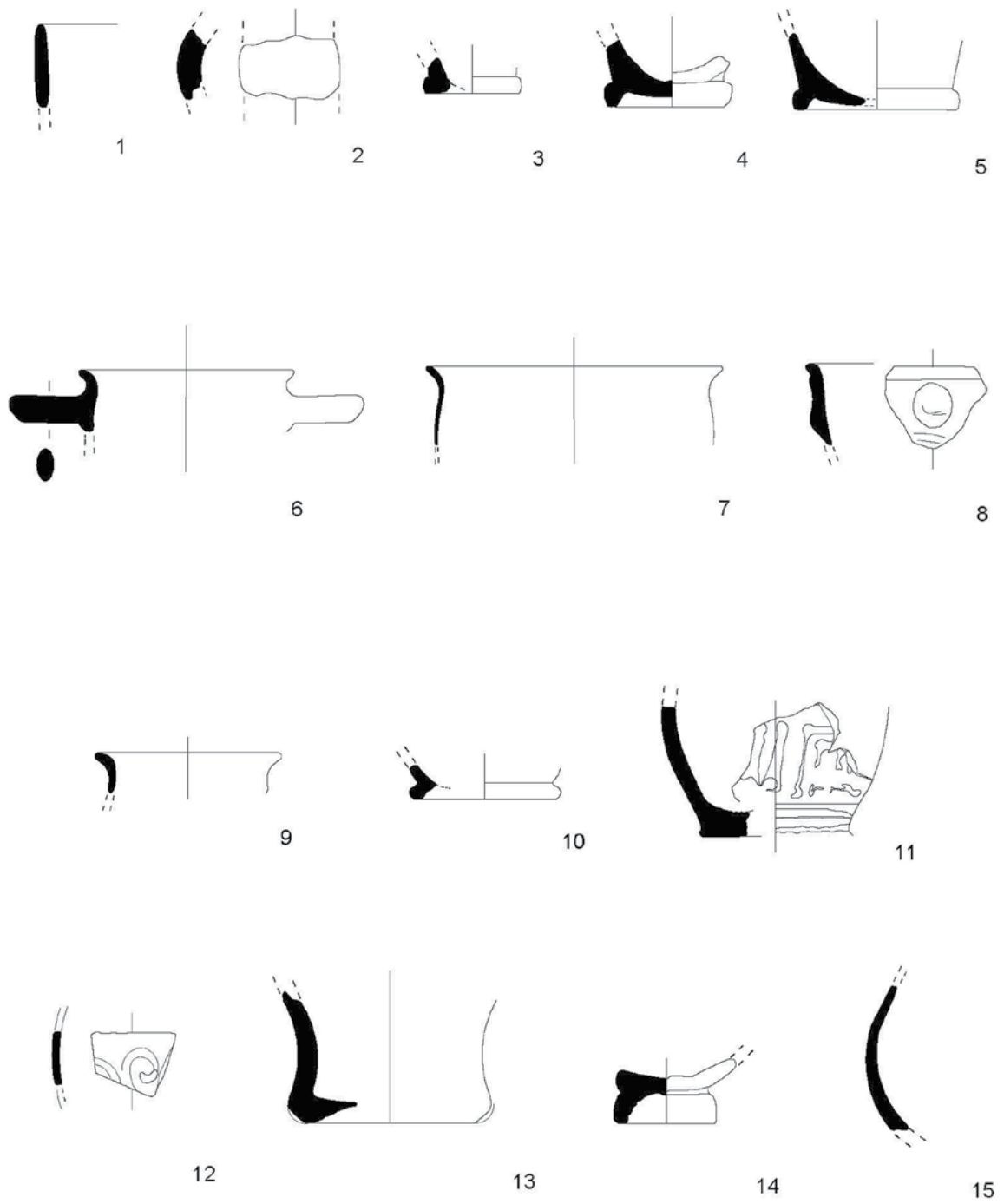
Only three body sherds and three lid sherds are preserved. Catalogue nos. 41 and 42 are two different large pithoi and no. 43 is of a smaller one (Fig. 30, no. 2). Of the lids (Pl. 4, nos. 44-46) 46 is of c. 56 cm in diameter, indicating that it covered a large pithos. One, not illustrated, also from SU 23 and of the same fabric, has a groove where the missing rim would have started. Additionally, a sherd (not illustrated) of the same fabric and thickness has a conical hole (1 x 2 cm). Two of the pithoi sherds (nos. 41 and 42) are thick in section indicating that they could have been rather large. It is difficult to date these jars as no rims are preserved. The fabrics are similar to the Greek pithoi found at Pharos (Kirigin 2017).

Minimum number of pottery shapes

Of the total finds, fine wares are represented with 8 skyphoi, 5 jugs, 2 bowls, 1 lekanis or related, and 1 bigger vase (krater?). Among the coarse or table wares there are 2-3 large table amphorae and 1 smaller, 4-5 jugs and 1-2 cooking pots (?). There are 4-5 transport amphorae, two large pithoi and a smaller one. If we take into consideration these sherds, we can almost be sure that some 90% of each vessel is missing. This could indicate that there were even more pots. Be that as it may, it is

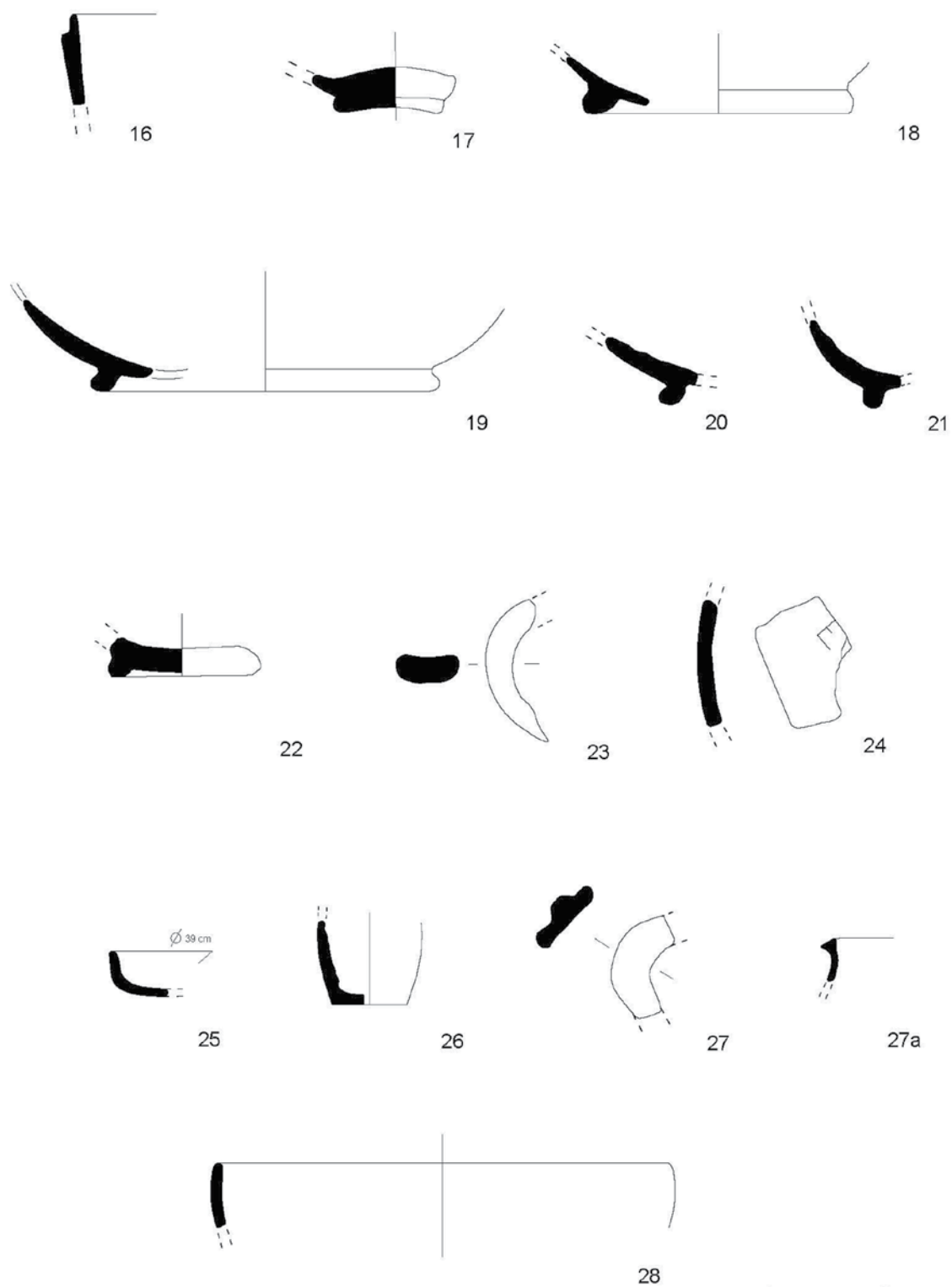
³⁷ Fine wares from the first half of the 4th century BC, as well as amphorae, are known from Pharos: see Katalog Pharos 1995: passim; Kirigin 2018; Kirigin, Barbarić 2019.

³⁸ .

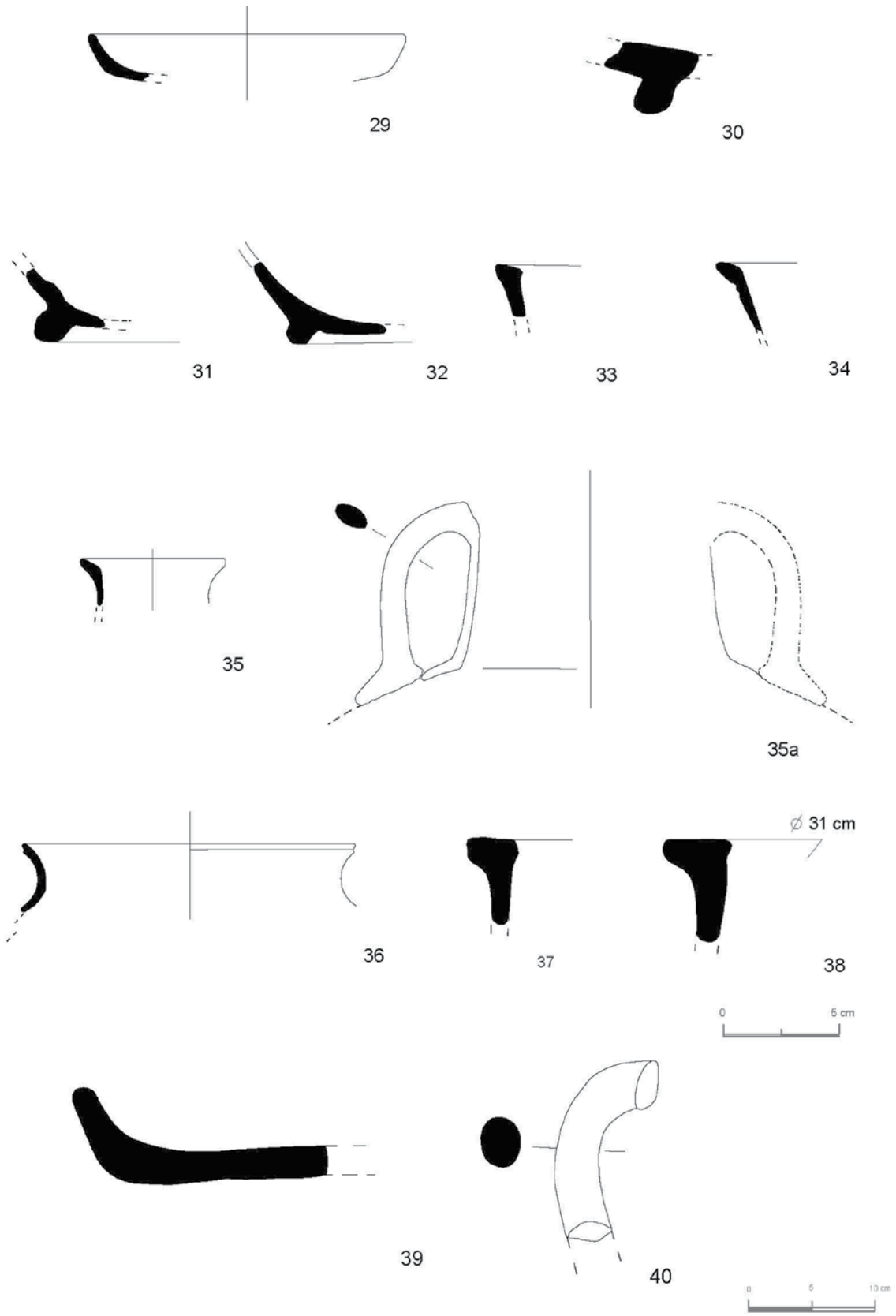


Pl. 1

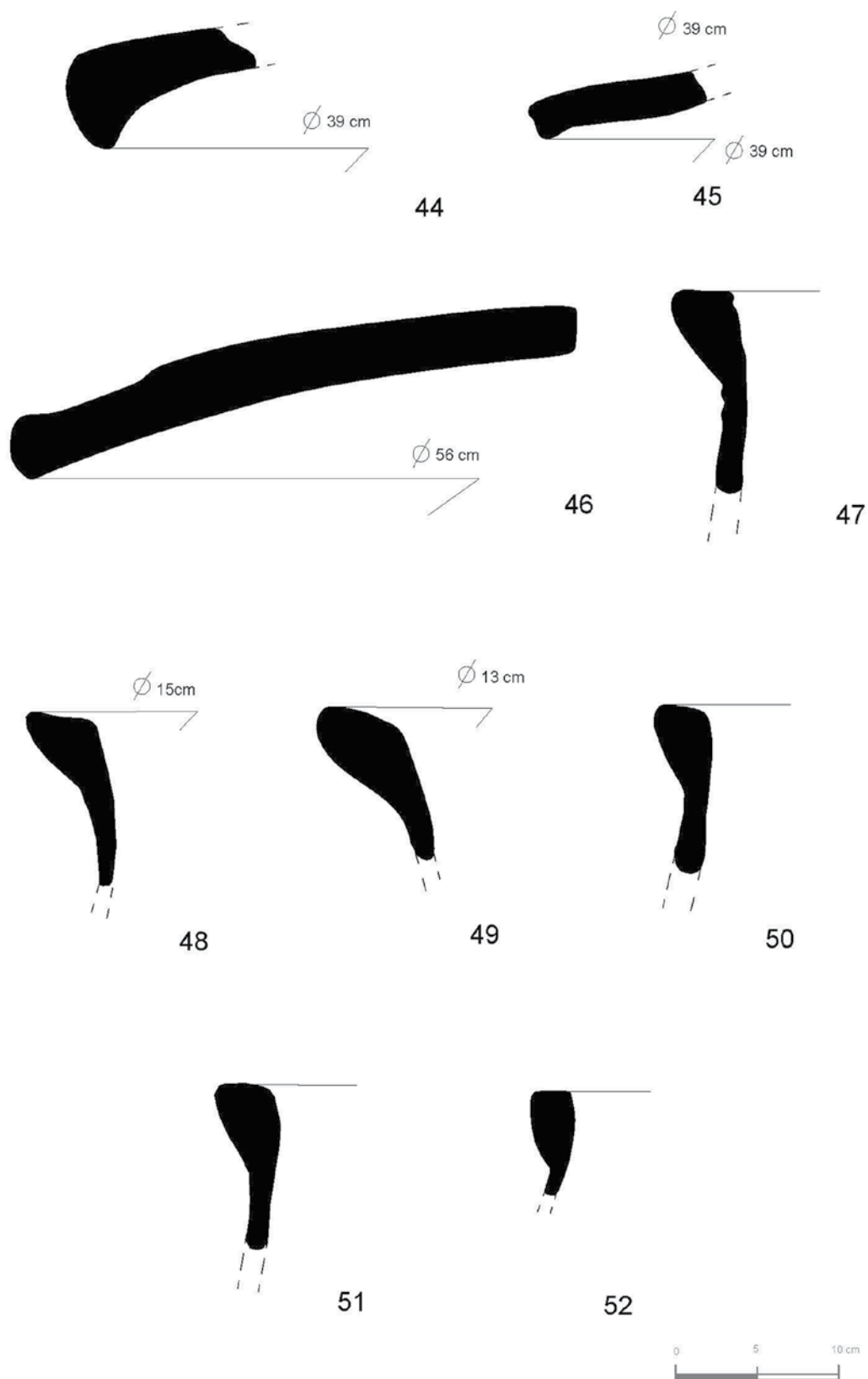
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Material culture in South-Eastern European Archaeology



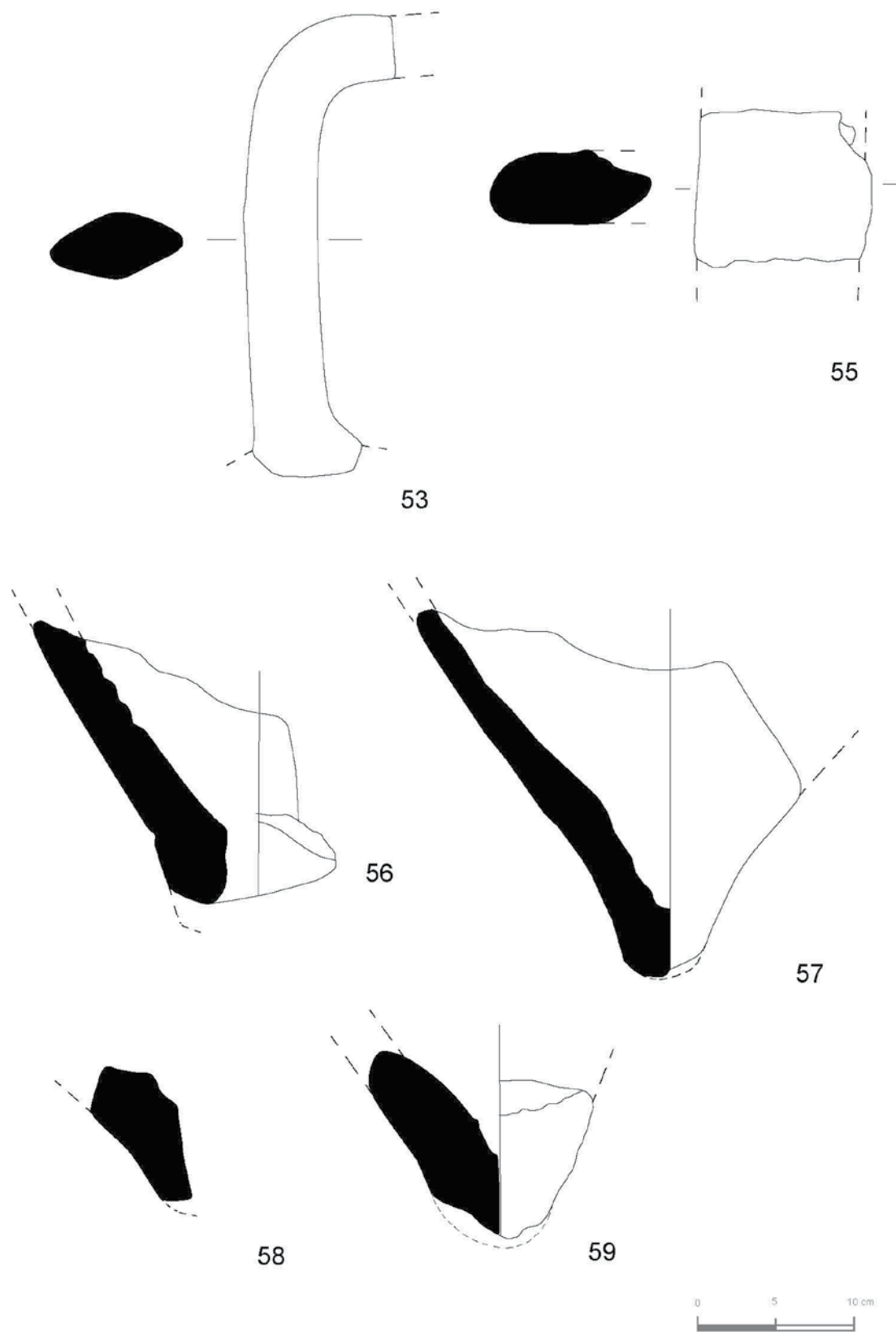
Pl. 2



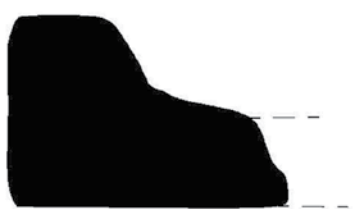
Pl. 3



Pl. 4



Pl. 5



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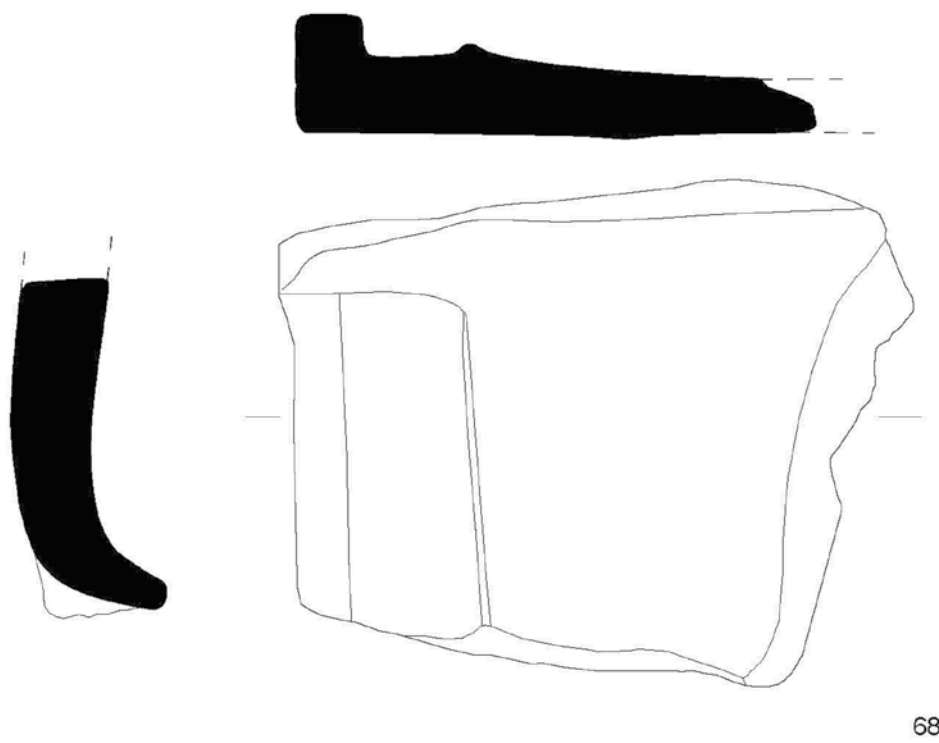
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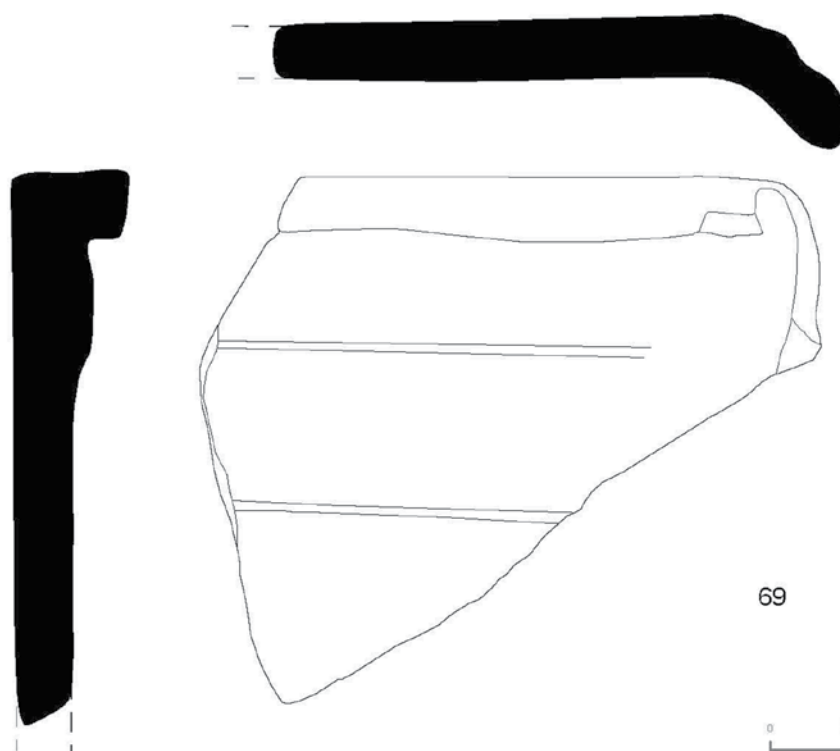
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Pl. 6



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Pl. 7



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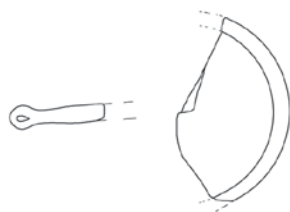
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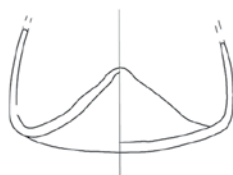
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80



Pl. 8

evident that, at some point, there was a need for a permanent team at the tower and that the pithoi and amphorae could have contained foodstuffs needed for difficult times.

Roof tiles

As mentioned earlier, about 8-9 m² of roof tile fragments were found at Maslinovik. Most of them are flat tiles of the so-called Corinthian type that have various flanges on their longer sides and are made from various fabrics. The fabric that is mostly represented in our finds is made of fine clay with a yellow surface and a pinkish core (Pl. 6 and 7). Cover tiles comprising three shapes are much less frequent (Pl. 8, nos. 70-72.).

Greek tiles, except decorated ones or those with stamps, have yet to be comprehensively studied. Similarities in shape and dates are to be found among the tiles from the Ionian island of Kephallénia (Randsborg 2002, 149-152). The same types of tiles are found in Pharos, where those unearthed at our site must have come from³⁹.

As mentioned above, some 67 m² of tiles were needed to roof the tower. This would mean that we are missing c. 70% of the tiles that were used. The way in which these tiles were interlocked has yet to be discerned. The tile fragments found in 1987 include a distinctive cover tile that, on its inner side, has a straight vertical edge of a flange with a platform on one side and a rounded low edge on the opposite side (Figure 30, no. 4)⁴⁰. No stamps or other marks on tiles were recorded.

Late Hellenistic pottery

Next to the plate rim (Pl. 2, no. 25) there were only 4 more grey FW body sherds (all 25 gr) found (3 from SU 28 and 1 from SU 25). These may represent typical deep bowls. Together with a beaker sherd (Pl. 2, 26), the jug handle (Pl. 2, no 27) and the neck sherd of a presumed Lamboglia 2 amphora from the 1987 excavations, found along the southern wall (Fig. 16, no. 64), these may be the only evidence of some presence at the tower in the period from the second half of the 2nd to the mid-1st century BC.

Early Roman Period

Only one recognisable sherd belongs to this period (Pl. 2, no 27a). It is close to Riley's no. 499, dated to the 1st century AD (Riley 1979: 259, Figure 102).

Later Roman period

Only five small sherds can be attributed to this period. Next to nos. 28 and 29 (Pl. 2 and 3), two body sherds and a very small ring foot sherd were found. No. 28 is Hayes form 50b, dated from the mid-4th to the early 5th century AD or later, and no. 29 is Hayes form 64, dated from the late 4th to the late 5th century AD. Additionally, a glass base could belong to this period (Pl. 8, no. 76). No other finds from this period were recorded.

Glass finds

Most of the glass sherds are of a recent date. Few belong to the Late Roman and/or Medieval periods (Pl. 8 no. 76 and 77).

Metal finds

Very few metal finds were found. They consist of a small bronze disc (possibly an unstruck coin flan?) (Figure 21), 1 smaller bronze nail with a large circular head (Pl. 8, no. 78) and a long, very corroded, iron nail also with a large circular head (Pl. 8, no. 79) that could have been used to secure the wooden floor beams.

Animal bones and shells

These are also very rarely found, indicating that meat was not consumed much by the tower occupants. Little can be added to the analysis of the faunal remains made by Mario Jurišić in 1989 (Jurišić 1989). His main observation is that the sample is rather specific as it consists exclusively of far distal sections of feet. The sample consists of 13 phalanxes and 1 astragalus of sheep/goat, 10 phalanxes of cow, and 2 phalanxes of pig. One cow phalanx is perforated and might have been used as a pendant. In later excavations we also found a few bones and a few phalanx bones and 4 astragali (SU 9, 18 and 25). In trying to find an explanation, I have considered that these bones could have been used as gaming pieces for the guards of the tower who whiled away the time in this manner (Kirigin 2004: 113; Kirigin 2006: 91. For animal bones from Pharos see Gastra 2016. For games using

³⁹ Overfired tile sherds were found in Pharos indicating local production: see Kirigin, in preparation.

⁴⁰ Unfortunately, the tile sample from the 1987 excavations was lost at some point.

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astragali see Dandoy 1996; Tahberer 2012). Next to the large number of crushed murex shells that were found below and around the central square block (SU 3) within the tower, only three oyster shells have been found in SU 33, together with a few *Monodonta turbinata* found in SU 12 and 33.

To end this section, I note in passing that no fragments of millstones, loom weights, frying pans or braziers, lopades (although some body sherds indicate their existence), lamps, coins, metal parts of dress, arrowheads or tools were recorded.

Concluding notes

This is how I perceive the process of the building, occupation, destruction and abandonment of the tower (Fig. 31). The site was chosen as it has a good view from the north of the *chora* of Pharos and has visible contact with the *asty* of the *polis* to the south-west and with the tower at Tor to the south-east. On almost flat bedrock that has cracks and recesses, dressed stone blocks were placed. Where necessary, in some places the bedrock was cut so the blocks could fit better. When the first 2-3 rows of blocks were erected, the interior of the

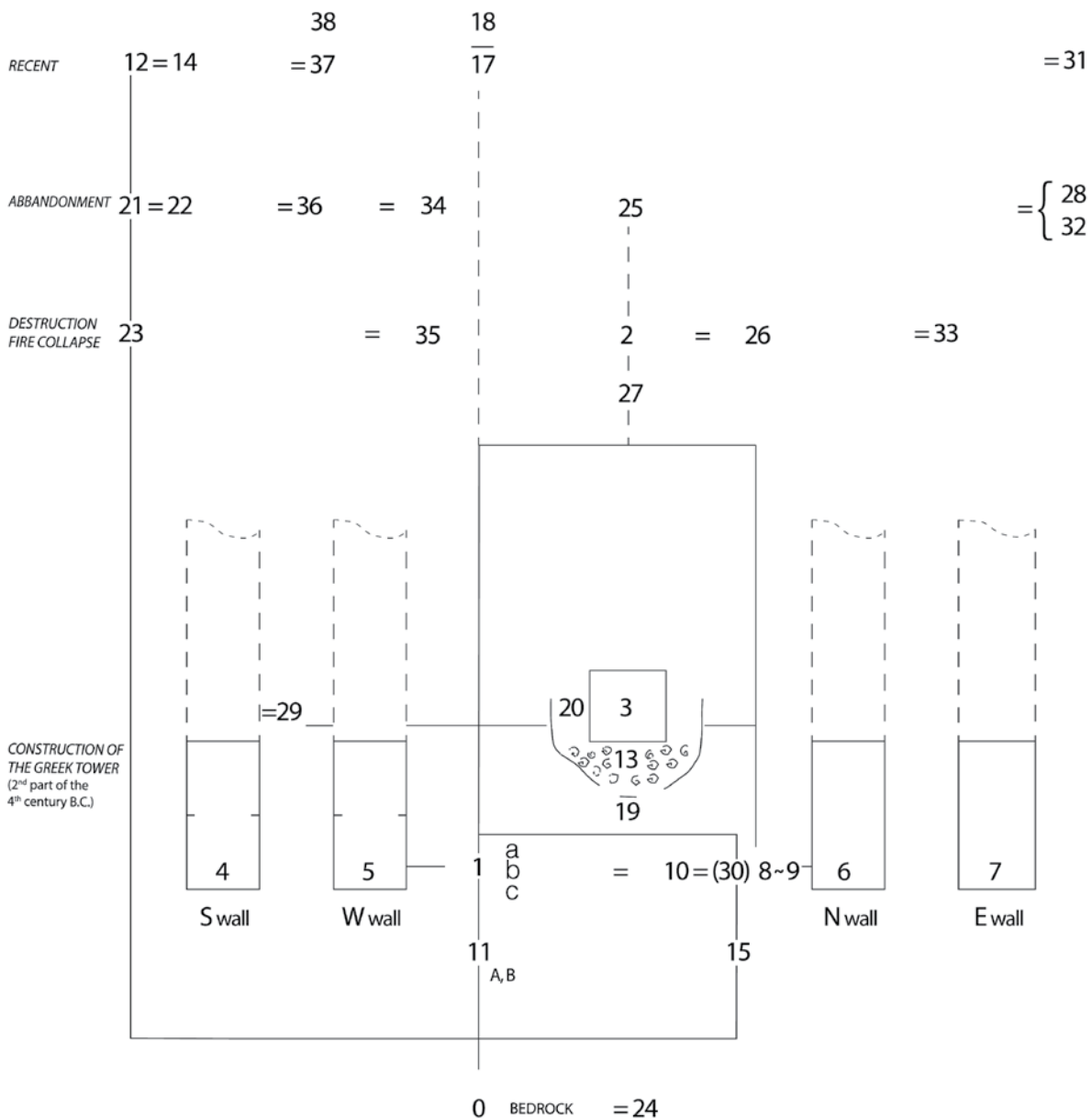


Fig. 31. Matrix of Maslinovik excavations. Made by Asja Zec (2020).

tower was filled with rubble consisting of small and large stones with some soil. After this, a pit was dug in the centre of the tower in which to place the central stone block. The building of the tower continued to the first floor. Square cuttings were made on tower blocks for wooden beams at the level of the first storey and a large wooden (?) pier was positioned on the central block that supported this wooden floor. The building of the tower continued to the second and maybe the third storey, an attic that was covered with wooden rafters and roofed with tiles.

As there are no traces of a door on the ground level, it is most probable that the door existed on the first storey. Amphorae, pithoi and other pottery sherds for cooking(?) and serving food and drinks indicate that on the first or second storey there was a kitchen and a storage area, including maybe an oven. A fire occurred at some point (remains of burned timber from 1987 and the burnt layer) and everything collapsed onto the ground floor. It is not known whether any repairs were made. As the tower ceased to have any purpose, tower blocks began to fall off, too. This stage lasted for a long period of time. There are several sherds from the 2nd/1st centuries BC, 1 sherd from the Early Roman period, and a few from the Late Roman period; almost insignificant when compared with the number of Greek and Early Hellenistic pottery sherds. This state lasted until the end of the 19th and early 20th century, when several buildings and the hamlet of Pavišići were erected in the vicinity, all using tower blocks. The dislodging of the tower blocks ended at the beginning of the 20th century. After 80 years, we have the situation that we encountered in 1987.

Considering the amount of soil within SU 2 (destruction layer) and SU 25 (abandonment), it looks as though these layers were formed over a long period of time. What we find in SU 22-24 along the southern wall (SU 4) – the most numerous finds –, could be the result of the removal of SU 25 within the tower towards the south when the tower blocks were moved to be incorporated into other structures. The situation in the southern trench is, thus, different than that along the other walls, where tower blocks were not removed when they had, at some point, fallen down.

It is also known that the pseudo-isodomic style is well attested in north-western Greece, Albania, Montenegro, Bosnia and Hercegovina and along the Croatian coast and its islands, making it a

trans-regional phenomenon. However, the way in which the pseudo-isodomic style of the exterior and interior faces of the tower walls at Maslinovik was combined has no parallels, as far as I am aware. Therefore, I suggest that this technique could be called pseudo-*emplekton*. How it came about remains unknown, for the time being, but it could have derived from narrow dry stone boundary walls that were used while building walls with two faces, a *longue durée* feature on karstic Mediterranean landscapes.

The Greek towers at Maslinovik and Tor are local Adriatic phenomena. Such or similar isolated towers are not attested on other parts of the island of Hvar (Gaffney et al 1997; Vujnović et al, forthcoming) nor on the neighbouring island of Vis (Issa) or, as far as I know, around Dyrrhachion and Apollonia, the only other Greek poleis in the Adriatic region.

The pottery described above gives prominence to the period from the second half of the 4th to the early-mid 3rd century BC. The supply in food and other necessities would not have been a problem, as Maslinovik is at most an hour's walk from Pharos. Thus, the presence of amphorae and pithoi is somewhat unusual and may be due to some reason that is, as yet, unknown to me⁴¹. At Maslinovik there are no indications that a farmstead existed nearby as is the case at other sites, for example on the Ionian island of Leukas (Lefkada) (Morris 2001 with other examples). The same pottery from all these periods at Maslinovik is found at Pharos, but regarding the Greek fine wares, Pharos has pottery from the first half of the 4th century (Katalog Pharos 1995; Kirigin 2018; Kirigin, Barbarić 2019) that is not present at Maslinovik.

According to these dates, it is possible that the tower was built in the second half of the 4th century BC, some 40 years after the foundation of Pharos. It is hard to tell for how long the tower was occupied, but it may have been in use in some way until the mid-1st century BC, although there is no material evidence from the mid/late 3rd to the mid-2nd century BC (the period of the three Illyrian wars). The absence of material evidence for this period might be explained by the change in the organisation of the defence of the *chora* of Pharos.

⁴¹ These containers would be more appropriate for the tower at Tor that is at a much higher elevation and at some 2 hours' walk from Pharos. For the finds from Tor see: Zaninović 1982.

From Greek inscriptions it is known that pirate attacks from the sea were also made during night time, so it is possible that there were permanent garrisons at the towers within the *chora* of Pharos. Officials responsible for the protection of the *chora* could have also existed (Chianotis 2008).

It is well known that the primary concern of Greek communities was the protection of the territory and the *polis* itself, not only in the motherland but also far away from home – in the *apoikiai*. The *chora* was the backbone of the *polis*. The agricultural production of the *chora* of Pharos, visible through the regular land division grid, the discovery of large number of type B amphora (imported and local) and pithoi, and coin iconography (the head of Demeter, the kantharos, the grape cluster), strongly indicate the potential wealth of Pharos in the 4th and 3rd centuries BC (Kirigin 2017 (pithoi); Kirigin 2018 (amphorae)). This wealth needed protection.

As we have seen, Pharos' territory was guarded by two isolated towers. The viewshed from Maslinovik provided by Google Earth Pro is slightly different from data presented here. This is because the elevation of Maslinovik in Google Earth Pro is at 52 masl, making Pharos and some other parts of the *chora* not visible. However, the official geological *height* of Maslinovik is at 66 masl, 14 m higher than that given by Google Earth Pro, thus making the visibility much greater.

Historical background

Except for the conflict with the natives a year after the foundation of Pharos (384 BC) described by Diodorus (XV, 14) and the battle mentioned on an 4th century BC inscription (CIG II 1837c), no other important conflicts are recorded in ancient literary sources prior to the 2nd Illyrian war in 219 BC, when the Romans “razed it (Pharos) to the ground” (Polybius III, 19). It is, thus, possible that there was a period of peace from the mid-4th to the late 3rd century BC, i.e., these towers protected the Pharians for some 120 years, or 4 generations. The archaeological evidence does not suggest that Maslinovik was occupied from the late 3rd century to the first half of the 2nd century BC (no Greco-Italic amphora, late Gnathia, or similar pottery has been found)⁴². Some minor activity at

Maslinovik is attested from the second half of the 2nd to the mid-1st century BC (Lamboglia 2 amphora and grey wares), as well as in the Early and Late Roman periods.

While it is tempting to connect the same orientation of the tower and the Greek regular land division within the *chora* of Pharos and, use the dating evidence from the Maslinovik tower, to date the initial date of the layout of the grid, more evidence is needed to support this hypothesis.

Given that the current state of research on Greek and Hellenistic fortification walls in Dalmatia and along the eastern Adriatic coast lacks firm dates and as Faber's paper from 1976 needs a thorough revision, the data provided from the excavations at Maslinovik can be a good starting point for future research.

Afteword: While my paper on Maslinovik was handed over to the publisher I have in the meantime written and published an extensive paper on the ancient tower at Tor (see Kirigin 2022). I thought that it would appear after the tower Maslinovik was published.

Acknowledgements

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⁴² This is in contrast with the finds from the Tor tower (Zaninović 1982). Future excavations at Tor will certainly clarify this.

Select catalogue (Plates 1 - 8)

Abbreviations Max. height = maximum height, Est. diam. = estimated diameter, Max. dim. = maximum dimension, BG = black gloss

Prehistoric pottery

1. Pl. 1, 1. Prehistoric rim sherd from SU 11 (Džep A = pocket A). Max. height 3.3 cm, 0.5 thick. Fabric 2. 6 gr.

2. Pl. 1, 2. Prehistoric handle sherd from SU 11. Max. height 3.9 cm. Fabric 1.13 gr.

Greek and Hellenistic fine ware⁴³

3. Pl. 1, 3. Skyphos ring foot sherd from SU 34. Ochre clay with pinkish surface and rare small white grits. Soapy⁴⁴. Est. base diam. 4 cm. No gloss visible. 7 gr.

4. Pl. 1, 4. Skyphos ring foot from SU 23. Ochre clay. Soapy. Base diam. 4.8 cm. No gloss visible. 24 gr.

5. Pl. 1, 5. Skyphos ring foot sherd from SU 23. Ochre clay. Soapy. Est. base diam. 7 cm. No gloss visible. 18 gr.

6. Pl. 1, 6. Skyphos rim and handle sherd from SU 23. Ochre clay. Soapy. Est. diam. 11 cm. No gloss visible. 8 gr.

7. Pl. 1, 7. Skyphos rim sherd from SU 23. Yellowish clay. Soapy. Est. diam. 14 cm. No gloss visible. 5 gr.

8. Pl. 1, 8. Skyphos rim sherd with handle root. Worn BG on rim. Pinkish clay. Soapy. Est. diam. 13 cm. No gloss visible. 7 gr.

9. Pl. 1, 9. Skyphos (?) rim sherd from SU 25. Hard fired brown clay with rare mica and tiny white inclusions. Est. diam 11 cm. No gloss visible. 2 gr.

10. Pl. 1, 10. Skyphos (?) ring foot sherd from SU 28. Ochre clay. Soapy. Est. base diam. 7 cm. 5 gr.

11. Pl. 1, 11. Jug (?) sherd with a flat bottom from SU 23. The slightly profiled edge of the base has been chipped off all around the preserved part. Worn BG meander ornament above a band. Worn BG on inside. Ochre clay. Soapy. Meander motif. Max. height 5.2 cm. 27 gr. Alto-Adriatico style.

12. Pl. 1, 12. Body sherd of a skyphos(?) from SU 23. Worn BG spiral ornament. Ochre clay. Soapy. Max. dim. 3.4 cm. 2 gr. Alto-Adriatico style.

13. Pl. 1, 13. Base (?) sherd of a large closed vessel from SU 23. Worn BG on the outside and below. The base ring (?) has been chipped off all around the preserved part. Light pinkish-brown clay with one white inclusion. Max. preserved dim. 9 cm. 51 gr.

14. Pl. 1, 14. Ring base of a bowl from SU 23. Traces of BG on base ring. Light pinkish-brown clay. Diam of base 3.9 cm. 17 gr.

15. Pl. 1, 15. Body sherd of a bowl from SU 25. Worn BG on both sides. Light pinkish-brown clay. Soapy. Max. dim. 5.7 cm. 12 gr.

16. Pl. 2, 16. Rim sherd and handle root of a lower part of a lekane or a related pot from SU 18. Fine BG on both sides. Pinkish clay. Max. dim 4.5 cm. 8 gr.

17. Pl. 2, 17. Slightly concave bottom of a bowl from SU 23. Finer BG on both sides. Pinkish clay. Base dim 4.4 cm. 29 gr.

18. Pl. 2, 18. Base of a jug (?) from SU 23. Ochre clay. Soapy. Est. base diam. 11 cm. 15 gr.

19. Pl. 2, 19. Base of a jug (?) from SU 23. Ochre clay. Soapy. Est. base diam. 13 cm. 18 gr.

20. Pl. 2, 18. Base of a jug (?) from SU 28. Ochre clay. Soapy. Est. base diam. 11 cm. 17 gr.

21. Pl. 2, 18. Base of a jug (?) from SU 23. Ochre clay. Soapy. Est. base diam. 6 cm. 11 gr.

22. Pl. 2, 23. Ring foot of a jug or bowl (?) from SU 23. Ochre clay with rare traces of BG. Soapy. Base diam. 6.3 cm. 36 gr.

23. Pl. 2, 23. Handle sherd of a jug from SU 18. Light pinkish core with ochre surface. Max. height 5.8 cm. 23 gr.

24. Pl. 2, 24. Body sherd of closed tableware pot from SU 18. Graffito on wall, single letter (E?) or symbol. Ochre clay with rare white inclusions. Max. height 5.5 cm, 0.5 thick. 10gr.

Late Hellenistic fine wares

25. Pl. 2, 25. Rim sherd of a plate from SU 2 found in square E5 within the tower in 1987. Light grey clay with worn grey slip on the outside and dull, dark slip inside. Soapy. Max. dim. 5 cm. 7 gr.

26. Pl. 2, 26. Sherd of a beaker (?) from SU 33. Ochre clay with worn thin, dark slip. Soapy. Max. height 3.3 cm. 12 gr.

27. Pl. 2, 27. Jug handle sherd with ribs from SU 33. Light brown clay. Soapy. Max. height 3.3 cm. 15 gr. 4 gr.

Early Roman coarse ware

27a. Pl. 2, 27a. Rim of a small cooking pot from SU 33. Triangular rim. Hard fired pinkish clay with mica. Est. diam.. 8 cm.

Late Roman fine ware

28. Pl. 2, 28. Rim sherd from SU 28. Pinkish clay with rare tiny white inclusions. Hayes (1972) form 50b. Max. height 5.8 cm. 9 gr.

29. Pl. 3, 29. Rim sherd from SU 34. Pinkish clay with tiny white inclusions. Hayes (1972) form 64. Max. Dim. 4.5 cm. 15 gr.

Greek and Hellenistic table and coarse ware, pithoi, amphorae, and tiles**Table and coarse ware**

30. Pl. 3, 30. Ring foot of a large jug or a table amphora from square C4, no. 55 (SU 2) found in 1987. Light pinkish-brown clay. Max. dim. 5 cm. 32 gr.

⁴³ Seven Greek sherds that are not included in this list were published in Kirigin, Popović 1988: 182, Figure 10.2.

⁴⁴ This could mean that the sherds that are soapy have been in moist soil a long time.

31. Pl. 3, 31. Ring foot of a large jug or a table amphora from western part of the interior of the tower, no. 48 (sub humus) found in 1987. Pinkish clay with rare white inclusions. Max. dim. 7.5 cm. 36 gr.

32. Pl. 3, 32. Ring foot of a jug from SU 32. Light pinkish-brown clay. Max. dim. 7 cm. 40 gr.

33. Pl. 3, 33. Rim sherd of a bowl (no. 37) found in 1987 outside the western wall. Pinkish clay. Max. dim. 3.4 cm. 7 gr.

34. Pl. 3, 34. Rim sherd of a bowl from SU 34. Light pinkish clay. Max. dim. 3.5 cm. 6 gr.

35. Pl. 3, 35. Rim sherd of a bowl from SU 8. Dark burned clay on surface. Brown fabric with tiny white inclusions. Max. dim. 3 cm. 2 gr.

35a. Pl. 3, 35a. Handle and neck of a jug from SU 23. Eleven joined sherds out of 83. Brown-pinkish clay with traces of yellowish slip on handle. Core of handle pinkish. Some body sherds grey on both sides. Clay with small dark inclusions and voids. Soapy. Est. diam. of neck 13 cm. 561 gr.

36. Pl. 3, 36. Rim and neck sherd of a cooking pot (?) from SU 23. Pinkish clay. With small white inclusions. Max. dim. 4.3 cm. 7 gr.

37. Pl. 3, 37. Rim of a larger bowl or a mortaria from SU 23. Light pinkish on inside and ochre yellowish on outside. Est. diam. 35 cm. 54 gr.

38. Pl. 3, 38. Rim of a large open pot from SU 23. Brownish clay with small, rare white inclusions. Est. diam. 40 cm. 64 gr.

39. Pl. 3, 38. Base and wall of a pan/platter (?) from SU 2. Light pinkish clay with pinkish and brown inclusions. Est. diam. 34 cm. 144 gr. Three parts have been mended.

40. Pl. 3, 39. Round handle of a larger jug(?) from SU 23. Pinkish clay with greyish core. Max. height 8 cm. 38 gr.

Pithoi

41. Figure 31, no. 2, upper left. Body sherd of a pithos found on surface near the south-west of the tower. Pinkish surface on both sides with many large and small white and dark inclusions. Core greyish. Max. dim. 12 cm. Thickness 2.3 cm. 236 gr.

42. Figure 31, no. 2, upper right. Body sherd of a pithos with small white and dark inclusions. Core ochre-greyish. Max. dim. 10 cm. Thickness 3 cm. 236 gr.

43. Figure 31, n/o. 2, bellow. Body sherd of a small pithos from SU 23. Brownish clay with many irregular white and pinkish inclusions, especially on the inner side. Max. dim. 16.7 cm. 1.7 cm thick. 340 gr.

44. Pl. 4, 44. Two joined rims of a pithos (?) lid from SU 23. Ochre pinkish clay with tiny white inclusions. Est. diam. 39. Max dim. 15.5 cm. 221 gr.

45. Pl. 4, 45. Rim of a large pot lid. Ochre pinkish clay with small white and pinkish inclusion. Est. diam. 39.

Max. dim. 11.4 cm. 86 gr.

46. Pl. 4, 46. Rim of a pithos lid from SU 23. Ochre pinkish with dark inclusions all over. Core light grey. Est. diam. 56 cm. Max. dim. 17.2. cm. 418 gr. with two joined sherds and one non-joined.

Amphorae

47. Pl. 4, 46. Rim of a type B amphora from SU 34. Two grooves below rim. Ochre clay. Max. dim. 7.2. cm. 70 gr. Two joined sherds.

48. Pl. 4, 47. Rim of a type B amphora from SU 23. Two grooves (?) below rim. Ochre clay with very rare mica. Max. dim. 8 cm. 38 gr. with 1 joined and 1 non-joined.

49. Pl. 4, 48. Rim of a type B amphora from SU 23. Ochre clay. Max. dim. 9 cm. 42 gr.

50. Pl. 4, 49. Rim of a type B amphora from SU 23. Ochre clay with very rare mica. Max. dim. 6.2 cm. 26 gr.

51. Pl. 4, 50. Rim of a type B amphora from SU 23. Yellow clay. Max. dim. 7 cm. 27 gr.

52. Pl. 4, 51. Rim of a type B amphora from SU 23. Pinkish clay. Max. dim. 4.5 cm. 11 gr.

53. Pl. 5, 52. Handle of a type B amphora from SU 23. Pinkish core, ochre surfaces. Oval in section with pinched edges. Height 14 cm. 168 gr.

54. Fig. 31, no. 3. Handle sherd of a type B amphora with a stamp – letter Σ – in an oval or iron like field from SU 23. Oval in section. Ochre clay. Max dim. 5.6 cm. 29 gr.

55. Pl. 5, 54. Handle sherd of a type B amphora. Oval in section. Pinkish surface, greyish core. Max. dim. 5.8 cm. 45 gr.

56. Pl. 5, 55. Body and base sherd of a type B amphora from SU 23. The top of the toe is missing. Groove separating body from toe. Wheel marks. Oval in section on inside. Yellow clay. Max. dim. 13 cm. 233 gr.

57. Pl. 5, 56. Body and base sherd of a type B amphora from SU 23. The very top of the toe is missing. Shallow groove separating body from toe hardly visible. Ochre clay. Max. height. 12 cm. 345 gr.

58. Pl. 5, 57. Toe sherd of a type B amphora from SU 23. The top of the toe is missing. Shallow groove separating body from toe is hardly visible. Ochre clay. Max. dim. 6.8 cm. 51 gr.

59. Pl. 5, 58. Toe sherd of a type B amphora from SU 23. The top of the toe is missing. Shallow groove separating body from toe is almost invisible. Ochre clay. Max. height. 6.5 cm. 116 gr.

Roof tiles

60. Pl. 6, 60. Sherd of a longer part of a tile with a straight vertical inner side of lower flange with platform. Surface find at north-western corner of the tower. Pinkish clay with yellow strips at core. Core also grey with rare dark, large and white inclusions. Max.

dim. 16 cm. 448 gr.

61. Pl. 6, 60. Sherd of a longer part of a tile with curved inner side of a lower flange with platform. Surface find at north-western corner of the tower. Yellow clay with rare small, dark inclusions. Max. dim. 17.5 cm. 568 gr.

62. Pl. 6, 62. Sherd of a longer part of a tile with rounded rim on the straight inner side of a lower flange with platform, from SU 2. Pinkish clay with grey core and rare dark inclusions. Max. dim. 10.5 cm. 243 gr.

63. Pl. 6, 60. Sherd of a longer part of a tile with slanting inner side of a low flange with platform, from SU 23. Greyish clay, possibly overfired. Max. dim. 12.3 cm. 283 gr.

64. Pl. 6, 60. Sherd of a longer part of a tile with a curved inner side of a low flange with platform. From SU 18. Pinkish surface and greyish core with rare white inclusions. Max. dim. 11.5 cm. 263 gr.

65. Pl. 6, 60. Sherd of a longer part of a tile with straight inner side of a lower flange with platform and a low square ridge on the body, from SU 23. Ochre fine clay. Max. dim. 11.5 cm. 361 gr.

66. Pl. 6, 60. Sherd of a longer part of a tile with straight inner side of a lower flange with platform and “nose” next to it, from SU 23. Yellow surface and pinkish core, fine clay. Max. dim. 10 cm. 245 gr.

67. Pl. 6, 67. Sherd of a shorter side of a tile with a moulded ridge close to the edge, from SU 23. Pinkish clay with rare large red and white inclusions. Max dim 21.2 cm. 490 gr.

68. Pl. 7, 68. Corner sherd of a tile from SU 23. On the lower side, there is a groove along the short side of the tile. This groove ends on the corner of the longer side of the tile. Ochre fine clay with pinkish core. Max. dim. 22.5 cm. 1135 gr.

69. Pl. 7, 69. Same as 68. This has no groove on the reverse, as 68. It could be the other end of 68. Max. dim. 25 c. 921 gr.

70. Pl. 8, 70. Sherd of a curved cover tile from SU 18. Ochre-pinkish clay with rare white inclusions. Max. dim. 13.4 cm. 226 gr.

71. Pl. 8, 71. Sherd of a polygonal cover tile from SU 2. Pinkish clay with rare tiny white inclusions. Max. dim. 13 cm. 255 gr.

72. Pl. 8, 72. Sherd of a cover tile with triangular edge. Yellow clay with rare tiny white and larger dark inclusions. Max. di. 19.2 cm. 451 gr.

Miscellaneous

73. Pl. 8, 73. A large sherd of a round shaped object with a higher thick base, a stand (?), from SU 23. Smoothed top and conical side. Pinkish brown clay with dark clay inclusions, Max dim. 16.5 cm. 466 gr. with two non-joined smaller sherds.

74. Pl. 8, 74. Rim (?) of a large basin (?) from SU 23. Ochre clay with small rare dark inclusions. Max. dim. 7.8 cm. 86 gr.

75. Pl. 8, 75. Rim (?) of a small tile (?). Ochre clay with rare dark inclusions. Max. dim. 5.2 cm. 30 gr.

75a. Figure 13a. A large part of a ceramic object (30 x 13 x 12 cm) from SU 25. Dark core, one stone and smaller inclusions. More red-orange on one side than on the other (interior?), found in 2016.

Glass finds

76. Pl. 8, 76. Part of a base of foot of a calix glass (?) from SU 31. Greenish colour. Est. diam. 5 cm. 5 gr.

77. Pl. 8, 77. Base sherd of a taller glass vessel with a concave base, from SU 31. Green core with worn patina, silver shine in places.

Metal finds

78. Pl. 8, 78. Bronze nail with a large round head found in square B5 (SU 2) in 1987. 2.2 cm long, head diam. 1.5 cm. 4 gr.

78a. Figure 22. Circular piece of bronze of 15 by 14 mm in size with traces of a dotted border and flat smooth sides and an oblique edge, from SU 23. 3.17 gr.

80. Pl. 8, 80. Upper part of a large iron nail, from SU 8. Very corroded. Head diam. 3.7 cm. 18 gr.

81. Pl. 8, 81. Upper part of a small iron nail, from SU 23. Very corroded. Head diam. 2.1 cm. 4 gr.

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