Shaping a city and its defenses: fortifications of Hellenistic Berenike Trogodytika

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Abstract: Key information on the location, size and dating of the Ptolemaic fortifications of Berenike Trogodytika comes from archaeological excavations carried out in 2013–2015, following the 2012 season when the presence of military architecture in the Red Sea harbor was first discovered and identified (Woźniak and Rądkowska 2014). Sections of a thick wall constructed of gypsum anhydrite blocks on a wide foundation were recorded in the northern part of the site (trenches BE-13/90 and BE13-93). The wall was part of the defenses protecting the harbor from the north, the only land access to the site through marshy ground on the fringes of the so-called "northern lagoon". Further work in trenches BE14-97 in 2014 and BE15-104 in 2015 uncovered the remains of a well-preserved early Hellenistic fortified city gate, built of gypsum anhydrite blocks and chunks of coral. The complex has no parallel at present anywhere in the Red Sea region. A series of shallow basins interconnected by pipes made of truncated necks of early Hellenistic amphorae, found east of the gate, probably collected rainwater. The water function? of the gate was confirmed further by a large basin or cistern, about 1 m deep, abutting the complex on the southwest. A subterranean network of four rock-cut chambers was discovered at the bottom of the internal gate chamber. A corridor in the east wall of the gate shaft, with a covered channel in the floor, led off to the northeast, in the direction of a rectangular anomaly observed on the magnetic map, a possible second rock-cut shaft.

Keywords: Hellenistic/Ptolemaic fortifications, Berenike, harbor, Red Sea, water installations

The search for the Ptolemaic town fortifications advanced significantly in 2013 with the recognition of magnetic anomalies observed on a geophysical map of the western part of Berenike Trogodytika (Woźniak and Rądkowska 2014: 516–523, for the map, see Herbich 2007: 24, Fig. 3-4). These were identified as a large fort, verified by excavation in 2012 (trenches BE 12-83, BE 12-85 and BE 12-86).[1] The excavators were attracted by an unidentified linear structure made of anhydrite blocks, fragments of which were visible on the surface in the northern

[1] Excavations of the remains of the northwestern tower in the northern courtyard of the fort were conducted in 2012 in order to reject the original industrial identification in lieu of the defensive character of this large building. The results of earlier archaeological work conducted by the Berenike Project in several places in the fort in 2000, 2001 and 2010 were reanalyzed in the light of the changed interpretation and presented in the first of three articles on the subject (Woźniak and Rądkowska 2014).

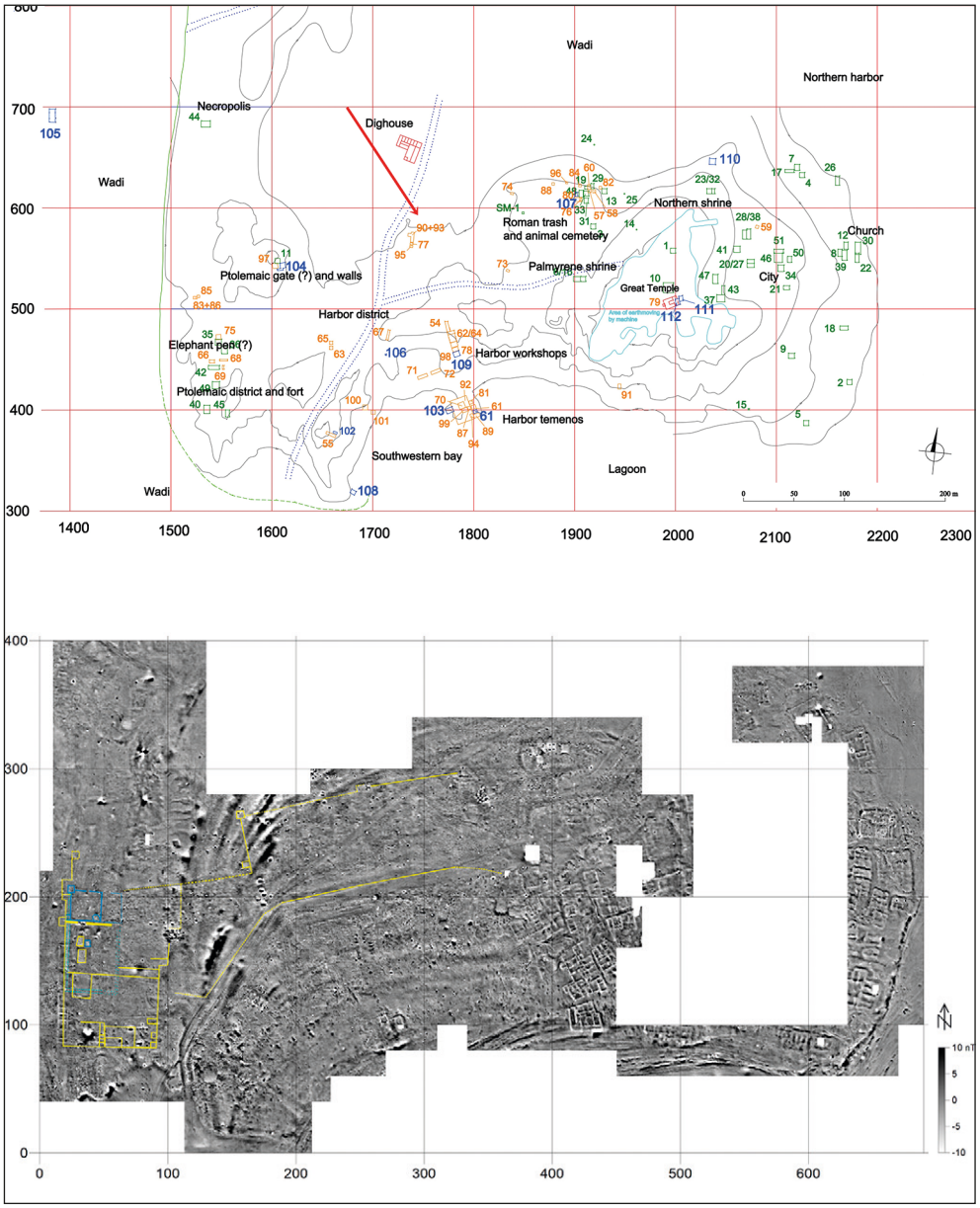


Fig. 1. Reconstruction of the main lines of the Hellenistic fortifications, the fort and the north wall with the south "harbor" wall, based on an analysis of magnetic anomalies; top, map with location of trenches with remains of Hellenistic military architecture (PCMA–University of Delaware Berenike Project/magnetic map processing T. Herbich, R. Ryndziewicz and D. Święch, 2014; interpretation M. Woźniak and J. Rądkowska; plan B. Wojciechowski, updated A. Szeszko)

part of the site (north of the presumed Hellenistic and early Roman harbor). The nature of the building material suggested an early date for this structure, Hellenistic or early Roman. The dating was corroborated by the results of excavation in the area directly to the south of it, interpreted as a Hellenistic dump with a small quantity of early Roman material (trenches BE 11-77, BE 14-95).

Excavation in 2013 (trench BE 13-90 and its extension BE 13-93) [*Fig. 1* top] revealed clusters of highly eroded blocks of anhydrite in more or less regular alignment [*Fig. 2*]. Stretching from east-northeast to west-southwest, these assemblages usually consisted of one course (two courses survived only in a few places) and were from 0.50 m to 1.50 m wide. The most interesting observation about the unearthed clusters of blocks and fragments of partly slaked anhydrite of various size was that they lay on the northern edge of a 2.50-m-wide strip of sand, which was, in fact, a large robber pit. It ran the same course as a stretch of anhydrite blocks suggesting that the two features were in some way connected. Lying at the bottom of the robber trench was a stretch of wall, one-meter wide, composed of blocks of diverse sizes, and broken fragments of anhydrite on a footing that was 1.60 m wide and made of the same material. The remains were at a depth of more than 1.50 m. Two of the largest blocks, both regular and quite well worked, measured 0.50 m in length and width, by 0.30 m thick; a third block was 0.70 m long, 0.35 m wide and 0.20 m

Fig. 2. Remains of the northern Hellenistic defensive wall: view looking east (PCMA–University of Delaware Berenike Project/photo S.E. Sidebotham)

thick. The other fragments were smaller and less regular.

The best-preserved eastern half of the uncovered wall clearly displayed its zigzag course, with the northwestern end situated about 1.50 m to the northwest of the southeastern one. Apart from a 2.50-m-long stretch (measured from the eastern face of the turn), stone robbers had completely destroyed the excavated portion of the northwestern part of the wall. All that remained were a few small (about 15 cm in diameter) and irregular pieces of anhydrite and one large fragment (about 0.80 m long, 0.60 m wide and 0.40 m thick) which must have broken off from one of the huge blocks that had formed this part of the structure. Moreover, the lower part of a smaller robber pit, of earlier date than the main one and running perpendicular to it, indicates the possible existence of a smaller structure branching off in a southeasterly direction from the middle of the northwestern part of the uncovered wall. This pit was partly visible in the lower part of the southern cross-section of the trench BE 13-93, next to the point where it joined trench BE 13-90. The present position of the trenches and the size of the main robbers' pit precluded an investigation of this tentative structure.

Tracing the uncovered fragment on the magnetic map of the site placed the structure in the middle of the length of a linear structure which further on, that is, northeast of trenches BE 13-90 and BE 13-93, runs straight on northeast for several dozen meters and disappears under a thick layer of early Roman rubbish (Sidebotham and Wendrich 2007: 44–54; Sidebotham and Zych 2011: 12–13) [***Fig. 1*** bottom]. Southwest of the above-mentioned trenches the structure (once probably a wall, now only its negative) runs directly west-southwest for about 120 m, then makes a 90-degree turn to the south-southeast. After about 45 m it turns back west-southwest and finally, after about 100 m, reaches the northeastern corner of the northern courtyard (*tetrapyrgion*) of the large fort building (Woźniak and Rądkowska 2014: 517–521). Evidence from the geophysical map suggests the existence of two additional square features, one at the first turn (approx. 5 m x 5m) and a second at a corner to the southeast. It remains uncertain whether these are towers or other structures.

Judging by the uncovered fragment, the whole of this structure was probably a stone wall. Its outline, visible on the geophysical map, suggests that it could have been the north defense wall of Hellenistic Berenike. First, it cuts through the rocky plateau where the fort stood (Harrell 1998: 121–131; Sidebotham and Wendrich 2007: 30; Woźniak and Rądkowska 2014: 516–523), forming the eastern part of its north wall, to the east of the northeastern corner of the *tetrapyrgion*. Then it runs more or less along the southern border of the flood plain, south of the northern lagoon. Its northeastern part probably adjoined the northern extent of a circular reef on which the Roman city was built later on. The remains unearthed in trench BE-10 (north of the so-called Serapis Temple) suggest that some unidentified buildings could have existed there already in the Hellenistic period (Sidebotham and Wendrich 2007: 56). This hypothesis is confirmed by the fact that the defense walls appear to protect this area from being accessed from the northwest (that is, the terrain with shallow waters and possibly

land that was flooded only temporarily),[2] which also indicates that some buildings existed there not only in the late Hellenistic period, but earlier as well.

This northern circuit turned the whole area between the wadi west of the fort and the northern lagoon and the open waters of the bay into a kind of inner city deployed on two elevated points: a rocky plateau occupied by the fort, and a circular reef on which the Roman city (and a Hellenistic residential quarter) stood, connected by a sandbank lying to the north of the southern lagoon. Surrounded by water on three sides, it was accessible by land only from the northeast by crossing the plateau. Rubbish dumps containing an abundance of pottery dated to the 3rd–1st century BC (R. Tomber, personal communication) occupied the sandbank bounded on the north by the middle section of the defense wall and on the south by an unidentified structure of earth and stone (referred to in reports as a "ridge") encircling the southwestern bay.

Results of the geophysical survey also indicated the existence of several linear structures, probably walls, inside the said ridge. The longest one is located the farthest to the north and corresponds to the northern and northwestern edges of the earth-and-stone ridge observed on the surface. The position and length of this feature suggest its function as a wall enclosing the area of the harbor lying on the northern bank of the southern lagoon (Sidebotham and Zych 2011: 23, Fig. 3-4, 26, Fig. 4-2). The anomalies traced on the magnetic map place the eastern end of this structure by the western edge of the reef on which the Roman city was built later,[3] while the southwestern end turns at a 270-degree and runs straight west as far as the east wall of the fort. This position could point to its Hellenistic origin since the fort went out of use at the end of the Hellenistic period and most of it was pulled down at the beginning of the Roman period to salvage building material (Woźniak and Rądkowska 2014: 522). Pending future archaeological investigation, the feature may be hypothesized as a parallel wall to the northern circuit, protecting the city from the direction of the harbor.

Hellenistic structures continued to be excavated in 2014 in Berenike, in the area directly to the south of a prominent mound composed of layers of drifted sand and ash, mixed with pottery and small fragments of anhydrite. The mound was enclosed, at least from the east and south, by a low wall (about 0.80 m high), measuring from 0.50 m to 0.55 m in width and built of porous white stone.[4] It separated the new trench BE14-97 (which adjoined

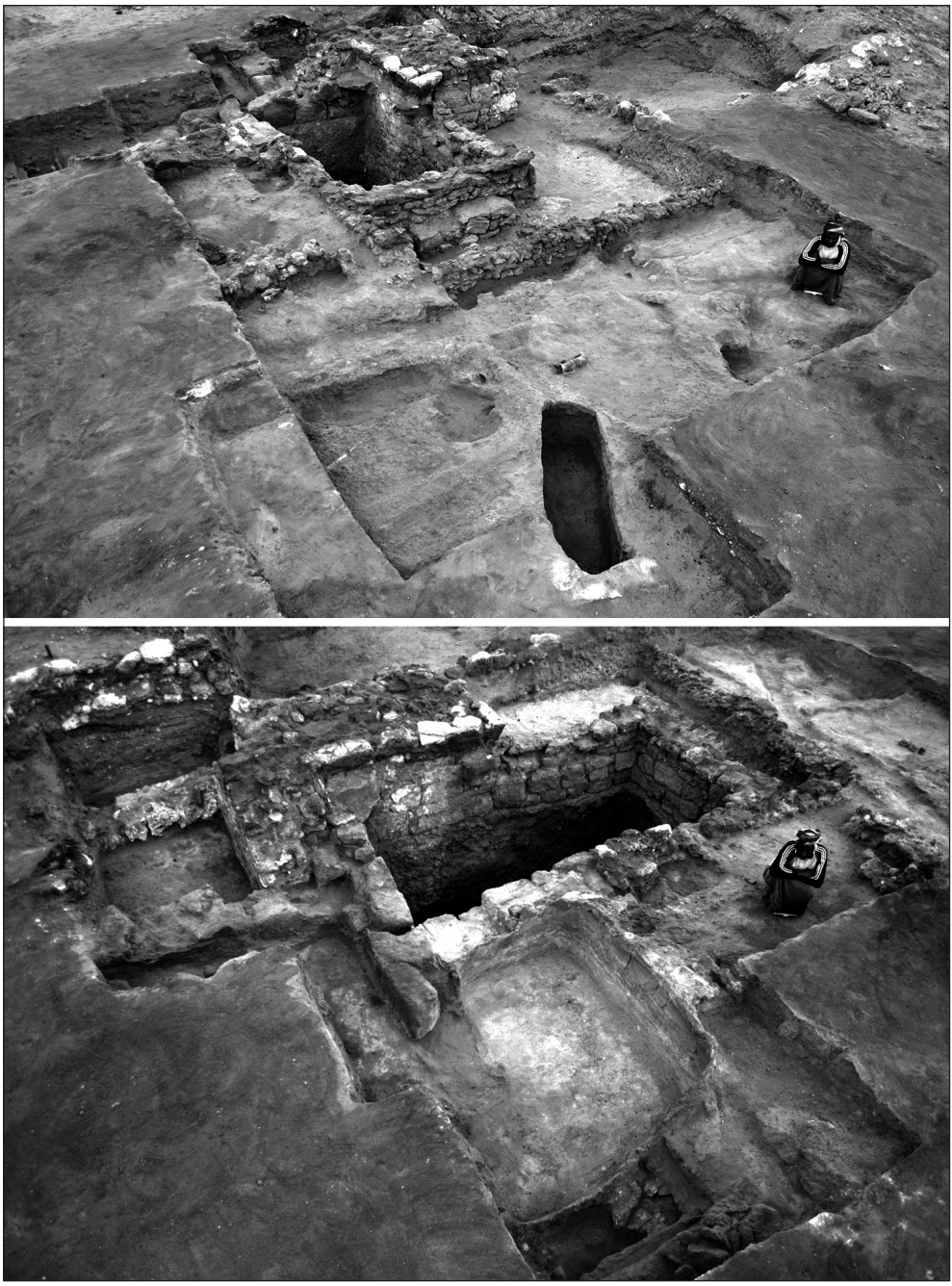
[2] Today the area north of the site is a low-lying wetland similar to the shores of modern lagoons surrounding the site, which are no longer inundated, but which lie just beyond the reach of the highest waves. It would have been regularly submerged at high tide in antiquity, even if the ground was no more than half a meter lower. Geological testing revealed thin alternating layers of gritty windblown sand and steel blue silt characteristic of shallow lagoon bottoms at a depth of approximately 0.70–0.60 m below the present ground level. There are no visible archaeological traces in all of the area to the north and northeast of the site (i.e., north of the line of early Roman and Hellenistic rubbish dumps), which could attest to the presence of wetlands there once.

[3] The wall may have continued southeast for about 60 m, along the western edge of the reef in the direction of the northern bank of the southern lagoon, but this cannot be ascertained due to the presence of later buildings in this area.

[4] It is clear from an analysis of the magnetic map that wall *004/009* was the south side of a square structure enclosing the mound of ash and pottery. The north wall of this feature is buried under drifted sand and ash spilling out from the mound, while the east one was partly uncovered in trench BE96-11 (locus *003*).

Fig. 3. Remains of the fortified northern gate of Hellenistic Berenike Trogodytika, view from the northwest. In the foreground, the western "pylon" with the destroyed remains of a retaining wall protecting the northern portal of the gate against sand and water. Main chamber of the gate behind the pylon, enclosed by later walls and with the northern and southern thresholds raised to protect it (PCMA–University of Delaware Berenike Project/photo S.E. Sidebotham)

Fig. 4. (opposite page) Remains of the fortified northern gate of Hellenistic Berenike Trogodytika: top, view from the east; bottom, view from the southwest (PCMA–University of Delaware Berenike Project/photos S.E. Sidebotham)
Top, foreground: earthen installations for accumulating rainwater with early Roman graves cut into them. In the background, the rebuilt east wall of the inner chamber of the gate (the only remains of the original first phase of the wall are the four large blocks in its central part). In front of it stands a late Hellenistic east wall built of small irregular stones. It was erected already after the destruction of the east curtain wall. which had originally run between the first Roman grave seen in the foreground and the northeastern corner of the trench where the human scale is seen.
Bottom: a large pool (not yet explored) seen in the foreground and to the north of it, the inner chamber of the gate with the western "pylon". The main west curtain wall is visible in the top left corner and in front of it there is the footing of the rampart connected with the northwestern corner of the "pylon". East of the "pylon", the wall blocking the northern portal, raised twice; note the threshold.



it from the south) from the older trench BE96-11, which had been opened inside the mound in order to examine its structure and contents (Sidebotham and Wendrich 1998: 101–108) [see ***Fig. 1*** top]. The wall was marked as locus *009* in BE14-97 and as locus *004* in BE96-11. Excavations in 1996 demonstrated that it was founded on layers of ash mixed with sand and potsherds, and that it was most probably a kind of fencing built around the mound (Sidebotham and Wendrich 1998: 104). Lack of any other structures inside the area enclosed by walls *003* (in trench BE96-11) and *004/009* (in the new trench) would support this interpretation.

Trench BE14-97 was opened on the southern side of the mound because traces of a massive structure built of large fragments of anhydrite and coral could be seen there under a thin layer of loose sand mixed with grey ash. After exploration, the structure (locus *005* in trench BE14-97) was cautiously identified as a solid western "pylon" of a fortified gate from the Hellenistic period [***Figs 3, 4***].

Well-dressed blocks of anhydrite used in the southern and western faces of the structure were of considerably different size. The ones in the southern face were smaller in the upper part (about 0.37–0.43 m long and 0.15–0.24 m high) and bigger in the lowest two courses (0.43–0.60 m long and 0.39–0.49 m high). Blocks in the western face measured 0.33–0.50 m in width, 0.25–0.32 m in height and about 0.50 m in length. In the outward faces, northern and eastern, smaller and more roughly-hewn fragments of anhydrite were mixed with large, up to 0.50 m long, fragments of coral heads. The core of the "pylon" was filled with small chunks, 15–20 cm in diameter, of anhydrite and coral bound with some kind of mortar, probably yellow clay, which can be obtained from the nearby wadi. On the

Fig. 5. Hellenistic pottery found in the fill of the negative of the east curtain wall (PCMA–University of Delaware Berenike Project/photos S.E. Sidebotham)

outside, the "pylon" measured 2.10 m going north–south and 3.40 m from east to west; the preserved remains rose 1.44 m above the level of the plateau on which it was founded.

The northwestern corner of the "pylon" was originally truncated to allow for the founding of a 0.95-m-wide wall (locus *049*), which runs west parallel to the main curtain wall (locus *022* in BE14-97). Only the lowest course of blocks has been preserved *in situ*. The blocks vary in size, the biggest ones (0.40–0.45 m by 0.40 m) forming the southern half of the wall. The western cross-section of trench BE14-97 revealed the presence of a kind of *proteihisma*, about 1.00–1.50 m high, built on this wall. At some point, but already after a "fence" (locus *004/009*) had been built around the pile of ash, probably to lessen the burden on this wall, the *proteihisma* collapsed to the south under the pressure of huge amounts of ash and drifted sand which had accumulated to the north and northwest of the western "pylon" of the gate. Since only a short stretch of this wall has been excavated to date, it is not clear yet whether it was a standard-type *proteihisma* or a retaining wall protecting the main curtain wall against accumulating sand.

The southeastern corner of the "pylon" was structurally connected to a wall (locus *017*), the northern part of which was about 0.60 m long N–S and at 1.20 m E–W twice as wide as this wall's southern part (1.34 m long N–S). Judging by the way the blocks were hewn, it seems that the southern part was raised later (maybe reconstructing a destroyed fragment?), possibly not long after the end of the first building phase. The anhydrite blocks, of which it was built, were even bigger than the ones used in the "pylon" (0.40–0.68 m high, 0.48–0.80 m long and 0.40 m wide). The northern part of this wall was more massive than the southern, even before the above-mentioned rebuilding, probably because it jutted out to the front of the 0.70-m-wide main curtain wall (marked as 022).

This curtain wall extends west to a point where two parts of wall *017* converge. Although the stretch uncovered in trench BE14-97 was only 2.40 m long, an analysis of the magnetic map and results of ground probing[5] indicate that it continues west for about 60 m, then turns south and joins the wall which encircled the northwestern tower of the *tetrapyrgion* of the Hellenistic fort in the second phase of its functioning (Woźniak and Rądkowska 2014: 516–520).

About 2.20 m south of the southern face of the "pylon" another massive wall joins with wall *017*, marked as locus *029* in trench BE14-97. Its western part was built mainly of anhydrite blocks, while the eastern one of cut fossil coral heads. As was the case with the other walls of the gate unearthed in this trench, the blocks varied in size, ranging from 0.12 m to 0.38 m in height, 0.20 m to 0.48 m in length and 0.10–0.15 m to 0.30 m in width. The western part, built of anhydrite blocks of more or less uniform size, could be the remains of the first phase of the building.

Remains of the western edge of the inner gate portal are clearly visible in wall

[5] Remains of a wall believed to be a continuation of curtain wall *022* were surveyed on the surface in several places in the area west of the Hellenistic gate and to the north of the fort excavated in 2012; it could indicate better preservation than in trench BE14-97. Taken into consideration together with the results of ground truthing and probing with steel rods, this may imply the presence of some large stone structures to the west of the gate (and possibly also to the east), probably additional towers related to the curtain wall.

029, 2.00 m to the east of the point of its convergence with wall *017*. The eastern part of this portal was dismantled, together with the original threshold (if it ever existed), during reconstruction of the eastern part of the gate, possibly at the same time when changes were made to wall *017*. It was then rebuilt with a new threshold raised about 0.70 m above the level of the old one. The threshold was made of regular, middle-sized, badly eroded fragments of anhydrite and coral, which in some places on its upper surface were apparently bonded with liquid lead poured over them. A hole in the inner western corner may have served as a door socket and the western end of the threshold curves southwards, which suggests that the doors set in the inner portal opened in that direction. Rebuilding of the inner portal and the eastern part of the gate could point to a temporary abandonment of the building after the first phase of its existence in the 3rd century BC. This lapse is difficult to date.

Similar traces of rebuilding are visible in the construction of the east (locus *016* in BE15-104) and north (locus *038* in BE14-97) walls of the inner chamber of the gate and in its outer portal.

Two phases can be distinguished in the construction of the wall uncovered on the eastern side of the "pylon", which is in a way an extension of its inner, southern face (locus *038* in BE14-97). The structure founded directly on bedrock (locus *038/2*) constitutes the first phase. It was about 0.50 m high and 0.45 m wide, and was built of large well-hewn blocks of anhydrite, measuring from 0.40 m to 0.50 m in height and 0.50 m in length, their width cannot be measured, though. Its eastern part clearly shows that it had been inserted into the northern portal of the gate. Originally, this portal probably had neither doors nor threshold and was about 2 m wide. It extended between the eastern edge of the "pylon" and the eastern end of wall *038/2* where two stacked stones constitute the only remains of the eastern edge of the first northern portal. Another stack of two well-dressed blocks of anhydrite shows that this portal was narrowed by about 0.50 m soon after its completion. The objective perhaps was to limit the amount of sand blown inside the gate with the northern wind, but presumably it was not effective considering that the portal was completely blocked with a wall not long afterwards. This wall (*038/2*) was probably a kind of high threshold which protected the inside of the gate from the sand. Other changes in the construction of the gate were similarly attempts to protect it from sand blown in with the strong northern winds, especially in winter, and washed down from the western plateau.

After the northern portal had been blocked with wall *038/2*, a kind of retaining or protective wall of unknown height was built to secure the portal and the inner chamber from the sand once and for all. It extended from the northwestern corner of the "pylon" for about 1 m to the north and then ran east in front of the whole portal, almost exactly below a much later wall (*004/009*) (Sidebotham and Wendrich 1998: 103, Pl. 3-81).[6] When it reached the northwestern corner of the non-existent

[6] It was shifted, however, about 0.25–0.30 m to the south, which is why it could not be seen in the southern cross-section of trench BE96-11. This difference in the course of the two walls, and the weight of the eastern part of wall *004* pressing onto the uneven ground could have caused this part of wall *004*, together with a fragment of the retaining wall underneath it, to slide down into trench BE96-11, which after excavation was filled only with sieved and untamped sand mixed with ash.

eastern "pylon" of the gate, it turned north and this fragment is visible as wall *003* in the eastern cross-section of trench BE96-11 (Sidebotham and Wendrich 1998: 103, Pl. 3-81, 105, Pl. 3-82). Effectiveness of this new wall, at least for some time, can be observed clearly in the western and northern cross-sections of trench BE96-11 (Sidebotham and Wendrich 1998: 110, Pl. 3-85). One can see a sand dune about 0.60 m high, accumulating gradually in a corner formed on its northern side. Soon, however, ash, debris and broken pottery began to be dumped there, leading to a high mound of ash that is still visible in this spot today.

Although the retaining wall protected the portal for some time, it fostered changes to the construction of the whole building. In order for the portal to be accessible from the east, the eastern "pylon" had to be pulled down. Its only remains, still visible today on the surface as well as on the magnetic map, consist of a layer of crumbled fragments of anhydrite and plaster dust which was uncovered in 2015 on the spot where the "pylon" had stood once. A large part of the east wall of the gate was also pulled down. A few massive and well-dressed, but eroded blocks of reddish anhydrite, visible in the central part of the wall, are the only remains of the original construction. Materials obtained during the dismantling of these structures could have been used to build the retaining wall. It seems that this reconstruction may have been related to the above-described changes to the southern and eastern parts of the gate.

Excavations in 2015 suggested the reason for this persistence in protecting the inner gate chamber from drifting sand. Entrances to four small (0.80–1.10 m wide and 1.50–1.60 m long) rooms or chambers were found inside the rectangular chamber of the gate, about 2.00–2.50 m below the preserved tops of walls and approximately 1.50 m below the level of bedrock forming the plateau (the interiors have yet to be explored) [***Figs 6, 7***]. Two of these rooms were hewn in the north wall of the chamber and two directly opposite in the south wall. All the entrances had flattened arches and the ceilings sloped sharply towards the back at an angle of approximately 45° [***Fig. 7*** left].

An equally interesting structure was discovered in the southeastern corner of the main chamber. A narrow and low (0.60–0.65 in width and 1.03 m in height) opening cut in the east wall leads to a tunnel which extends east for approximately 7 m and then makes a 35° turn to the northeast [***Fig. 8***]. The tunnel runs on in that direction but only 2 m could be explored in the 2015 season; the tunnel is blocked by sand fill, which most probably fell inside through a "skylight" cut in the vault. A narrow drain, 0.30 m wide and 0.40 m deep, was cut into the floor of the tunnel on its right side and covered with stone slabs. Interpretation of anomalies traced on the magnetic map suggests that the tunnel could have linked the inner chamber of the gate with another square structure measuring 5 m by 5 m. A large crater of sand, visible around this feature on the map and on the surface,[7] indicates that it was most probably a shaft of similar

[7] A thick white line is clearly visible on the magnetic map running along the northern and eastern edges of this structure. It is usually interpreted as evidence of high magnetism of the object it surrounds. However, experience from Berenike shows that such lines can also appear around features hewn in hard bedrock and filled with soft, slightly magnetic drifted sand. The clear outline of this square structure located to the northeast of the gate is enclosed by a "halo" devoid

Fig. 6. Inner chamber of the Hellenistic gate, view from the west. In the foreground, top of the rubble heap in the partly-explored sandy fill (PCMA–University of Delaware Berenike Project/photo S.E. Sidebotham)

construction as the chamber of the gate.

The presence of a big pool lined with a 5-cm-thick layer of hydraulic mortar, close to the southwestern corner of the Hellenistic gate, could indicate that these structures were associated with water which was probably brought to town from wells located somewhere at the foot of the nearby mountains.[8] A heavy stone counterweight found in the sandy fill of the inner chamber

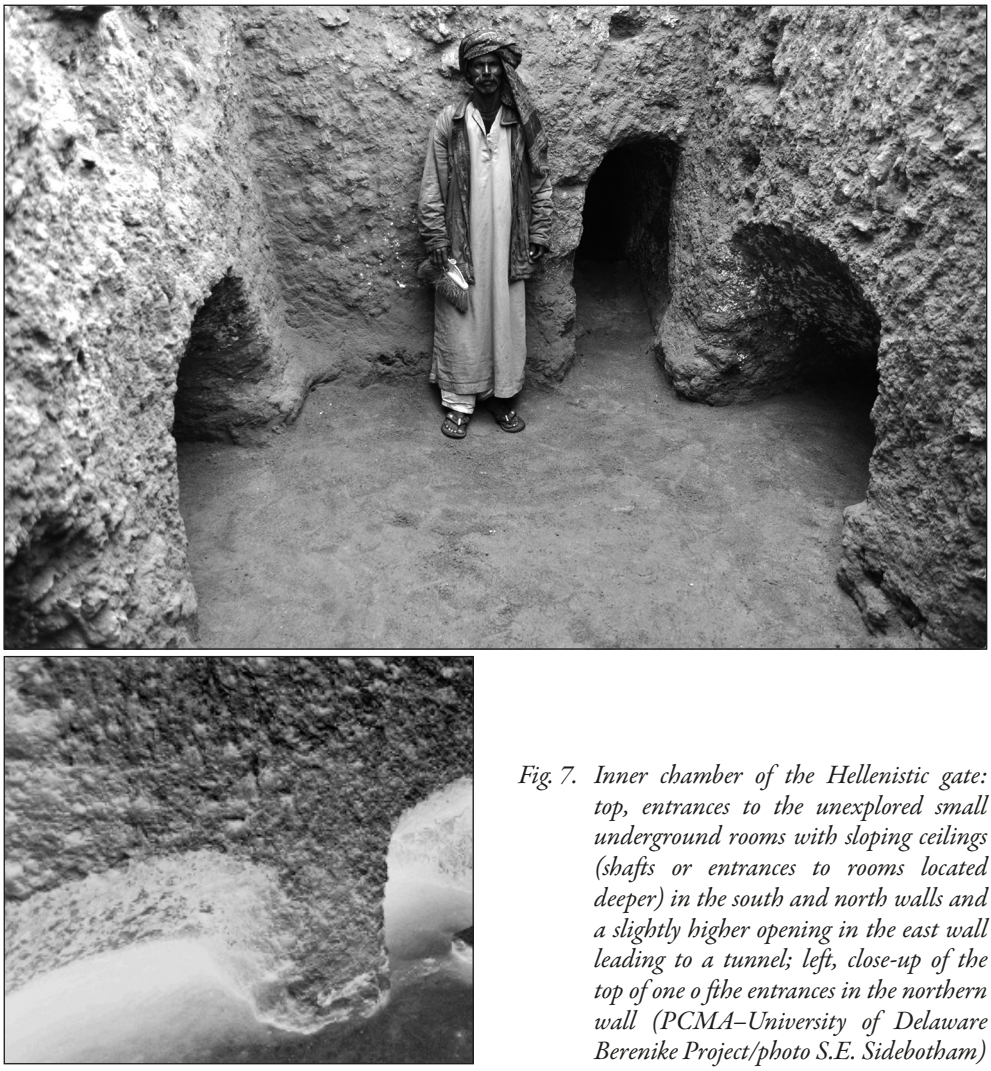


Fig. 7. Inner chamber of the Hellenistic gate: top, entrances to the unexplored small underground rooms with sloping ceilings (shafts or entrances to rooms located deeper) in the south and north walls and a slightly higher opening in the east wall leading to a tunnel; left, close-up of the top of one o fthe entrances in the northern wall (PCMA–University of Delaware Berenike Project/photo S.E. Sidebotham)

of anomalies. This area on site appears as a depression measuring 15 m in diameter and filled with soft and loose drifted sand. Thus the "halo" is probably the edge of the crater of sand sliding into the shaft. The size of the crater suggests a considerable depth of the shaft itself.

8 Such practices are well attested for the Roman period, both in written sources and in archaeological finds (Sidebotham 2011: 71, Pl. 6-1, 80, 87–124).

of the gate and two massive stones jutting out from the "pylon", which were a foundation for a structure as yet unidentified, can also suggest a water function(?) of the installations inside the gate. The counterweight was probably part of a crane or a lift mounted on the stones projecting from the south wall of the "pylon" and used for lifting water stored in the underground chambers and for pouring it into the pool by the gate. The underground tunnel could have been both a passage linking two cisterns and an overflow channel used either to keep the water level stable or to transfer it between the two structures.

Another interesting installation, pre-

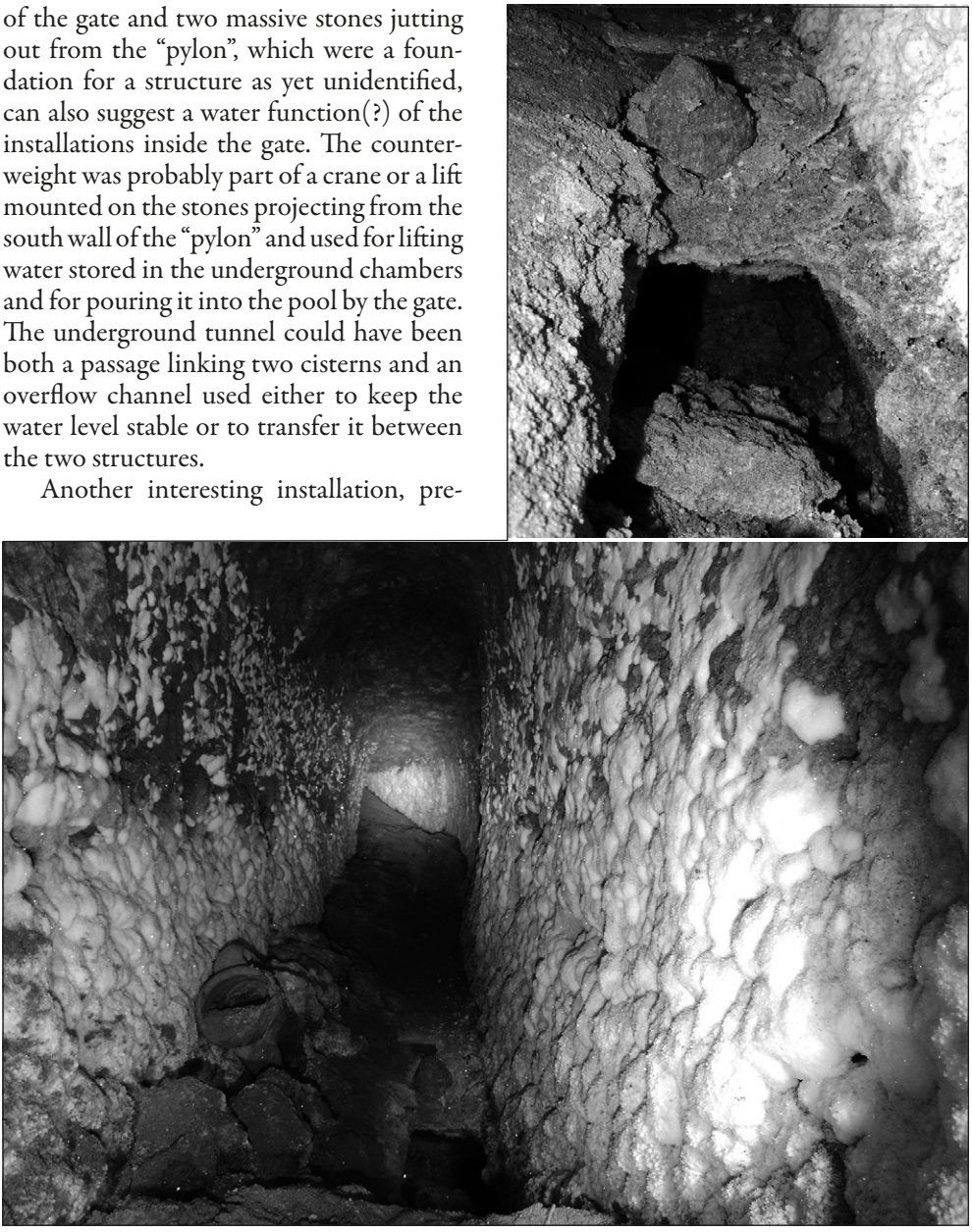


Fig. 8. Tunnel in the east wall of the inner chamber of the Hellenistic gate: top, view toward the back end where it turns to the northwest; thick salt efflorescence covers the walls; right, sunken part of the channel cut into the floor of the tunnel inside the chamber of the Hellenistic gate and covered with thin stone slabs (PCMA–University of Delaware Berenike Project/photos M. Woźniak)

sumably used for collecting and discharging rainwater, was discovered east of the gate. A number of shallow (approximately 0.10 m deep) basins/pools was uncovered in trench BE15-104, east of a late wall (locus *015*) dated to around the 2nd–1st century BC [***Fig. 4*** top]. They were dug out in the clayey ground and separated by low earthen ridges equipped with a kind of overflow openings made of the cut-off necks of two Hellenistic amphorae (dated to the 3rd–2nd century BC), the rims of which abutted each other. The "pools" extend to the east of the walls of the gate along the robbers' pit, most probably marking the location of the east curtain wall. Thick salt efflorescences, covering the bottoms of the basins/pools, as well as the clayey layers in which they were made, in addition to the overflow openings indicate that the whole set was a primitive, though probably effective, installation for collecting rainwater. It has not been determined yet where this water was discharged, though certainly not to the chamber of the gate. It could have been collected in underground reservoirs of the shaft visible on the geophysical map or in another cistern which has yet to be found.

The fill of the chamber of the gate consists mainly of thick layers of gritty aeolian sand sinking to the south. The presence of the above-described structures and the absence of any levels of use could indicate that a kind of wooden platform was used for passing through the gate. It was presumably mounted on the thresholds with the help of a wooden load-bearing structure, a likely trace of which is a rectangular socket in the lower part of the east wall of the chamber where a beam rested. The platform was probably fixed permanently, though it may have also been possible to raise it or draw it back (to the south), if the need to close the gate arose.

After crossing the platform over the deep "cellar/cistern" the traveler found himself most likely in a kind of small inner gate courtyard. Only a small part of it in its latest phase has been uncovered. It was cobbled with rounded stones and much eroded potsherds. Such courtyards, surrounded by walls with wall-walks, were a common feature of Hellenistic city gates (McNicoll 1997: 31), although in big cities their structure was naturally much more complex.

On the right side of the courtyard (looking south from the entrance) was the said big pool or kind of cistern, separated from it by locus *048* in trench BE 15-104. Although it has not been yet fully explored, its capacity can be estimated at 10,000 liters at least. This huge structure was enclosed by anhydrite walls: locus *048* from the east (0.60 m thick) and locus *029* from the north (0.70 m thick). Excavations in the 2015 season established that it extended to the west and northwest farther than initially projected, being bordered on the west by wall *048* and from the north by curtain wall *022*. At some point the pool was divided into two parts by the extension of the southern part of wall *017*, either to better withstand the pressure of water or for some other reason. An approximately 5-cm-thick layer of pinkish and gritty hydraulic mortar covered the walls of the pool, while two such layers were used on the bottom. Its size suggests that water stored there was intended not only for the soldiers standing guard at the gate, but also for arriving travelers.

The most interesting characteristic of the fortified gate uncovered in trenches BE14-97 and BE15-104, apart from its

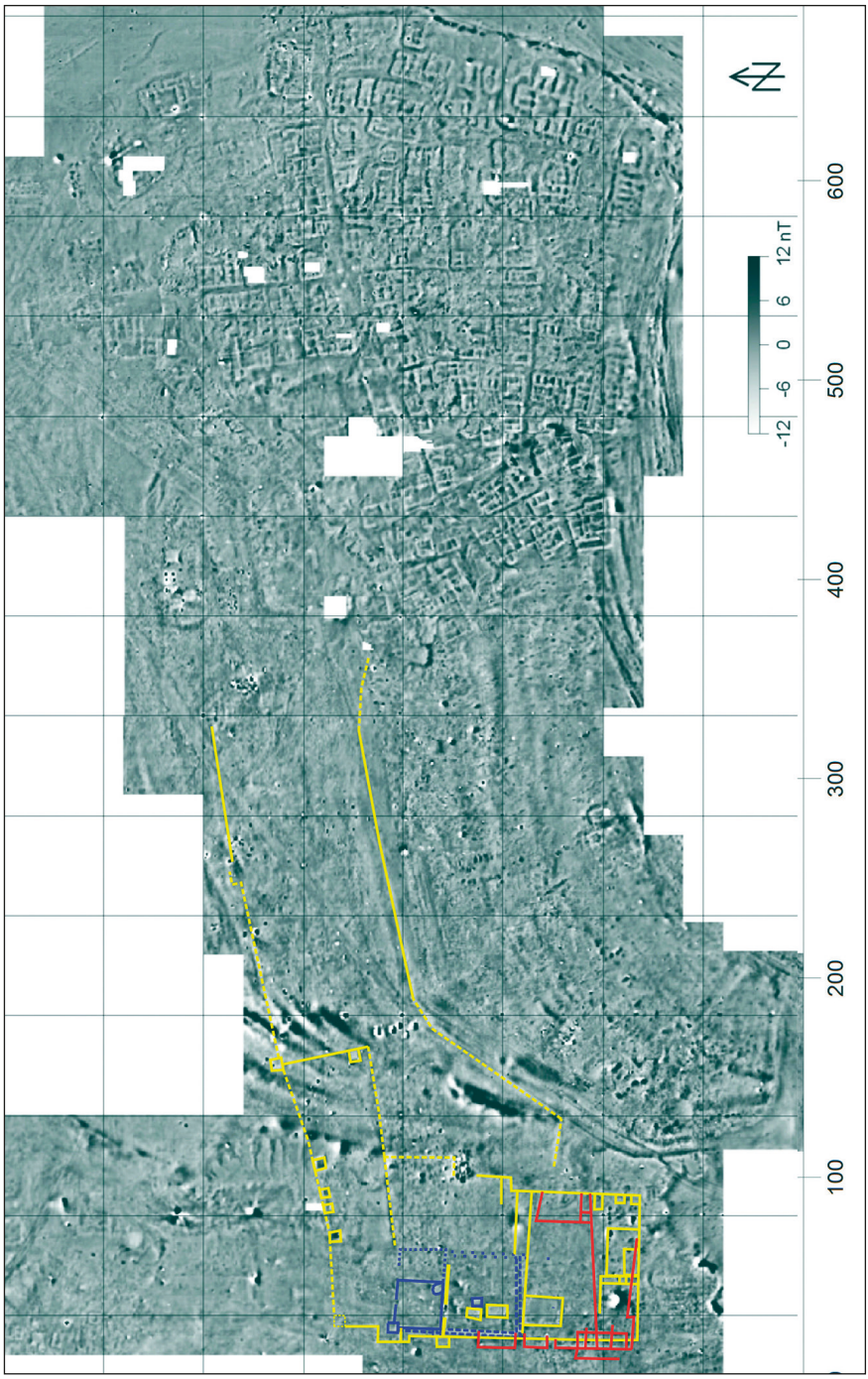


Fig. 9. Full reconstruction of the Hellenistic fortifications of Berenike Trogodytika. On the left, the Roman city which probably stood on the ruins of the eastern part of Ptolemaic Berenike (Map processing T. Herbich, R. Rynd ziewicz, D. Święch; interpretation M. Woźniak, J. Rądkowska)

construction, was the fact that it was not aligned with the walls discovered in 2013 in trenches BE13-90 and BE13-93. The geophysical map clearly shows that there were two lines of defense walls in this part of the foreground of the fort and that the gate belonged to the outer one [***Fig. 9***]. The space between them was 30 m wide and could have been a kind of courtyard used for inspecting the caravans arriving from the Nile Valley or for forming convoys which set out from the city/base with goods and animals brought ashore from the ships anchored in the harbor. Although the Hellenistic fortifications and buildings discovered to date in Berenike are impressive and unique in the region,[9] they constitute only a modest fragment of the great Ptolemaic city/base. Each season of excavations brings new discoveries and expands our knowledge of what life looked like in the first Hellenistic harbor to be examined archaeologically on the Red Sea and in the whole of East Africa.

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[9] No remains of Hellenistic architecture have been uncovered to date during excavations of any of the port cities on the Red Sea coast. It is also the only preserved example of Ptolemaic city defense architecture from the territory of Egypt proper (the remains of fortifications in Alexandria date from the Roman or even Mamluk period). Significant examples of fortified features from the Hellenistic period are known from the the Eastern Desert, but these are military forts and fortified *hydreumata*, not cities (Redon and Faucher 2014–2015; Brun t al. 2013).-

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