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Ptolemies : The Hellenistic Fort of  
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Localization, Form and Development  
(Part One)**

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# IN SEARCH OF BERENIKE OF THE PTOLEMIES

## THE HELLENISTIC FORT OF BERENIKE TROGODYTIKA, ITS LOCALIZATION, FORM AND DEVELOPMENT (PART ONE)

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**Abstract:** Berenike was a gateway to the distant lands of Africa and the Indian Ocean littoral and the archaeological record from the site testifies to the scope and rich array of goods passing through this Red Sea port. However, investigation of the Hellenistic origins of the town began in earnest only after a full magnetic survey was completed of the western fringes of the site where the Ptolemaic foundation was believed to have been established. Recent excavations in 2010 and 2012 have contributed important new data about the architecture of this part of the town. Of particular interest were the remains of a presumed *tetrapyrgion* associated with a huge defensive complex, roughly 150 m by 80 m in size, which may have been used, among other things, for bringing through wild elephants from Africa imported for use by the Ptolemaic army. This contribution initiates a series of articles by the author on the Hellenistic defenses now under excavation at Berenike, presenting an overview of the location and structure of the great fort/base of Berenike Trogodytika and its role in the network of military harbors on the Red Sea coast, and the posts on the routes and fortified outposts of the Eastern Desert.

**Keywords:** Berenike Trogodytika, Red Sea, Hellenistic/Ptolemaic harbor/port, fort/defenses, *tetrapyrgion*

Berenike Trogodytika lay in a sheltered bay, protected from northerly winds by the rocky Ras (Cape) Benas on the Red Sea coast of Egypt, some 300 km south of Quseir (825 km south of Suez) (Sidebotham, Wendrich [eds] 1995: 1) [Fig. 1]. It was situated in the fork of two small wadis that debouched into the sea. The Roman town, the ruins of which are visible on the ground, occupied an extinct

fossil reef jutting out into the sea (Harrell 1995: 102–103), rising some 2 m a.s.l., extending north and east of a small lagoon, a natural harbor, connected with a deeper bay that opened out to the sea. Today most of the lagoon is rather shallow. Wind, rain and sedimentation from the adjacent wadi have filled in the bay. Geological research in 1994, repeated and extended in 2013, demonstrated the much greater depth of

this lagoon in antiquity (Harrell 1995: 112–126), which would have permitted seagoing ships to enter it, and not just the anchorage in the outer bay, which is frequented even today by middle-sized commercial and military craft.

The Roman and late Roman occupational periods of the site have been presented extensively (for a comprehensive bibliography, see Sidebotham, Wendrich 2007). Knowledge of the earliest phase, corresponding to the founding of the port, has been augmented recently by new archaeological discoveries made at Berenike. The present article, the first in a series, briefly reviews the known

evidence from the site in the context of the location, layout, architecture and phasing of a large Hellenistic fort that appears to have been the principal industrial and storage facility at Berenike throughout the 3rd century BC. Successive articles will discuss the layout of the fortifications as a whole and their role in defending the harbor (where excavations are ongoing). In addition, we will examine the role that Berenike played in relation to other regional centers of the Ptolemaic network implemented to secure and operate the harbors, mining centers and trade routes in the Eastern Desert and on the Red Sea coast.

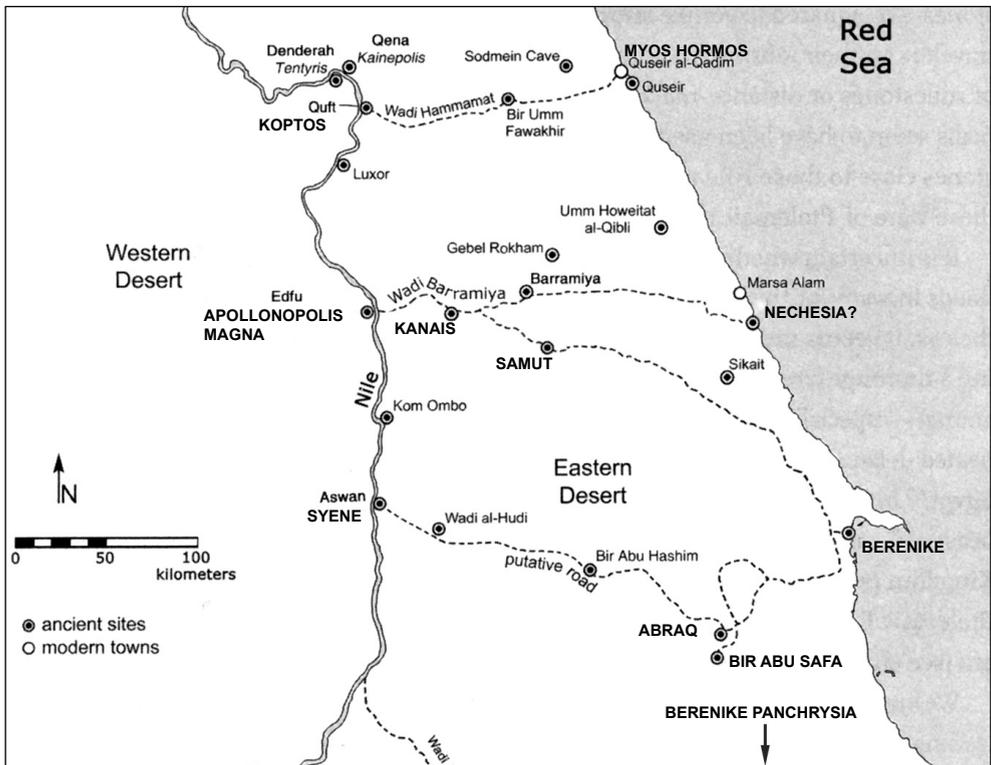


Fig. 1. Location of Berenike and the other Hellenistic forts/bases mentioned in the text (After Sidebotham 2011b: Fig. 3-1 with additions)

## BERENIKE TROGODYTICA IN THE ANCIENT SOURCES

The harbor of Berenike Trogodytika was one of the most important foundations of Ptolemy II Philadelphos (285/282–246 BC) in the Red Sea area (Manning 2003: 34; Sidebotham 2011b: 32–53). This new center, acting as a hub for an entire network of harbors along the western coast of the Red Sea, provided the Ptolemies access to the resources of East Africa, repeating the model of Pharaonic trade expeditions to the southern territories. Ivory, exotic wood and gold were among the luxuries and valuable goods available in Africa, but perhaps even more importantly, the region was a source of elephants, which were of immense military value to the Ptolemies (Sidebotham 2011b: 39–53). Elephants were trained for combat and used in battle to break enemy formations or to protect their own against enemy attack, especially by the cavalry. Such use of elephants, based on Indian models, was practiced in Hellenistic and later armies from the time of Alexander the Great. However, hostile relations with the Seleucids had practically cut off the Ptolemies from India, making both the pachyderms and the trained mahouts needed for their handling extremely difficult to come by.

The methodically established network of Ptolemaic ports and military bases had another purpose, too. It was to service the maritime trade with markets in southern Arabia, which were a source of valuable frankincense, as well as act as intermediaries in the trade in spices, precious and semiprecious stones and other goods brought from faraway India.

Numerous ancient sources, including Strabo (*Geographica* 16.4.5,7; 17.1.45)

Pliny (*NH* 6.33.168), the anonymous *Periplus Maris Erythraei* manual from the 1st century AD and Claudius Ptolemy (*Geography*) (Sidebotham 2011b: 14–15) mention Berenike as a key element of Ptolemy II's huge building initiative in the region of the Red Sea and southern Egypt, one of a series of harbors that included Nechesia, Philoterias, Arsinoë and Myos Hormos, identifying it specifically as the main harbor for reloading combat elephants, brought most probably from the territories of modern eastern Sudan and Eritrea. From Berenike the pachyderms were conveyed across the desert and then via the Nile to training facilities. The elephants were brought to Berenike from the south, through Ptolemais (Epi)theron or Ptolemais of the Hunt [identified tentatively with the neighborhood of Aqiq in modern Sudan (Seeger, Sidebotham 2006)], or some other port, whence inland hunting expeditions were organized. The animals were then loaded on specialized ships called *elephantegoi*. Maritime transport was chosen presumably because it was relatively quick and cheap, and avoided the Nile cataracts that made it difficult for ships to navigate. Moreover, east African goods carried along with the animals would have financed, to an immeasurable extent, the enterprise (Burstein 1996: 799–807). Once the monsoons were discovered, most probably in the 2nd century BC (Strabo, *Geographica* 2.3.4–5; Pliny, *NH* 6.26.100–101, 104; Sidebotham 2011b: 15, 35–37), trade contacts were activated between the Red Sea and India via southern Arabia, thus giving rise to the famous maritime Spice Route.

## DISCOVERING HELLENISTIC BERENIKE

The first to actually locate the site was the cartographer and geographer Jean Baptiste Bourguignon d'Anville (1766: 231–233), whose map helped Giovanni Belzoni to discover the ruins in 1818 (Belzoni 1822). Sir John Gardner Wilkinson followed a few years later (Wilkinson 1835: 418–419), making the first and, as it turned out, highly accurate plan of the city (Sidebotham, Hense, Nouwens 2008: Fig. 7.9, 161). Both Belzoni and Wilkinson concentrated their efforts on the late Roman city standing on a fossil reef promontory, exploring the so-called Serapis Temple in the center of the site, which sand had covered up to the roof (levelled at 7 m a.s.l.). Belzoni and Wilkinson described the silted up lagoon situated directly south and southwest of the ruins. Belzoni also mentioned houses scattered in the neighborhood and tombs to the west of the main town (Belzoni 1822: 79–80). The identification with ancient Berenike Trogydytica was obvious to both of them, based on indications in the ancient sources, including the location in reference to characteristic landscape points, such as the huge massif of the Pentadaktylon, and other known stops on the Berenike–Edfu route from the Hellenistic period and the Berenike–Koptos road of the Roman era. Other travelers and scholars followed in their wake, conducting more or less scientific explorations, which included repeated clearing of the Serapis temple (Sidebotham 2011b: 16–17).

An American–Dutch team headed by Steven E. Sidebotham (University of Delaware) and Wilhelmina Z. Wendrich (Leiden University) conducted the first regular archaeological excavations on the site. The project continued for eight

seasons between 1994 and 2001. Then, following a few years' hiatus, the project was reactivated in 2008 as an American–Polish effort of the University of Delaware and the Polish Centre of Mediterranean Archaeology, University of Warsaw, co-directed by S.E. Sidebotham and Iwona Zych. Fifteen seasons in the field to date of the two international projects have extended considerably the available archaeological data on the harbor itself, highlighting at the same time the richness and cosmopolitan nature of commercial and cultural contacts between the port and East Africa, South Arabia and South Asia (India and Sri Lanka) in the Roman period (Sidebotham 2011b: 55–56, 221–258). Twelve different languages and writing systems have been attested so far in the archaeological record (including Greek, Latin, Demotic Egyptian (hieroglyphs), Aramaic or Hebrew, Palmyrene, Coptic, Tamil, a hybrid of Sanskrit and Prakrit, Hadramauti, which is a pre-Islamic South Arabian language, and one still unidentified (see Sidebotham, Wendrich 2002: 28). There was a variety of religions venerated in this harbor town: Serapis, Isis, Zeus, Tyche, Harpokrates, Aphrodite/Venus, the Palmyrene Yarhibol, a Roman imperial cult, Judaism, Christianity, perhaps even Mithraism (Sidebotham, Wendrich 2002: 35) and in recent seasons also an unidentified cult, tentatively of South Arabian origin, in the Harbor Temenos (Rądkowska, Sidebotham, Zych 2013: 209–228). Highlighting the scope of Berenike's commercial contacts in the early and late Roman periods are beads from Java, India, Sri Lanka, modern Thailand and Vietnam, coins from Axum (King

Aphilos, late 3rd/4th century AD) and India (King Rudrasena III, 4th century AD), Indian-made textiles, banded-agate cameo blanks etc. (Sidebotham, Wendrich [eds] 2000: 251–274). Archaeobotanical research has identified exotic plants and seeds, including coconut, rice, bamboo, Mung beans, teak and sandalwood, black pepper from India, lotus flowers, Yemeni iris, frankincense etc. (Cappers 2006: 7, 157, 161, 163, Zieliński 2011: 59–66).

Like the early travelers and investigators, the archaeologists in the first seasons of regular excavations concentrated on the ruins of houses, temples and streets observed in the late Roman town located on the fossil reef and characterized by an obvious element — the undressed coral heads used for building construction. They paid relatively little attention to the western part of the site.

A geophysical survey with a magnetometer, conducted in 1999 by Tomasz Herbich from the Institute of Archaeology and Ethnology of the Polish Academy of Sciences, produced a magnetic map of the area northwest of the presumed southwestern harbor bay, suggesting the presence of an architectural complex that was only poorly manifested in remains on the flat ground in this part of the town (Sidebotham, Wendrich [eds] 2007: 22–29). The magnetic results were used in the 2000 season to locate two relevant trenches, BE00-36 and BE00-40. (There were additional trenches excavated in this area in 2001; these, however, have yet to be published.)

The first of these trenches excavated during the 2000 season yielded three features [Fig. 3], one of which (situated in the northeastern corner of the trench) was

a severely damaged cistern (Sidebotham, Wendrich [eds] 2007: 32, Pl. 4-1, Locus 035, 33 Pl. 4-2, Pl. 4-3, 34), while the other two were storage containers intended, most likely, for dry goods rather than liquids (Sidebotham, Wendrich [eds] 2007: 32, Pl. 4-1, Loci 020, 022, 36). The cistern (035) was set in a special cut in bedrock. It measured 2.25 m by 1.02 m, but only a small section in the southwestern corner was explored. The floor was rendered with a thick two-layered waterproof mortar and the walls probably had the same, but they were robbed out. As a result, only a negative of the structures in bedrock could be recorded. The mortar on the floor was preserved fragmentarily, two smooth layers, 3 cm and 4 cm thick respectively, set on a bedding of gravel and debris about 0.27 m thick (Sidebotham, Wendrich [eds] 2007: 34). The containers were in better state of preservation. The southern one (022) was 5.50 m wide and at least 2.25 m long, although it extended farther south, beyond the southern trench wall of BE00-36. Of the other one (022) only the southeastern corner was cleared, but the excavated part ran for 2.12 m N–S and 4.15 m E–W; the structure was preserved to a height of 0.75 m. With no hard evidence of waterproof plaster anywhere in these two features, one has to assume that they were originally intended as siloses for dry goods, for example grain. In a second phase, thin crossing walls partitioned the southern bin (022). The northern one (020) appears to have gone out of use (Sidebotham, Wendrich [eds] 2007: 33–35). The cistern (035) at this point was already destroyed and fragments of the waterproof mortar from its walls were used to build the partition walls in the southern container (022). It was turned

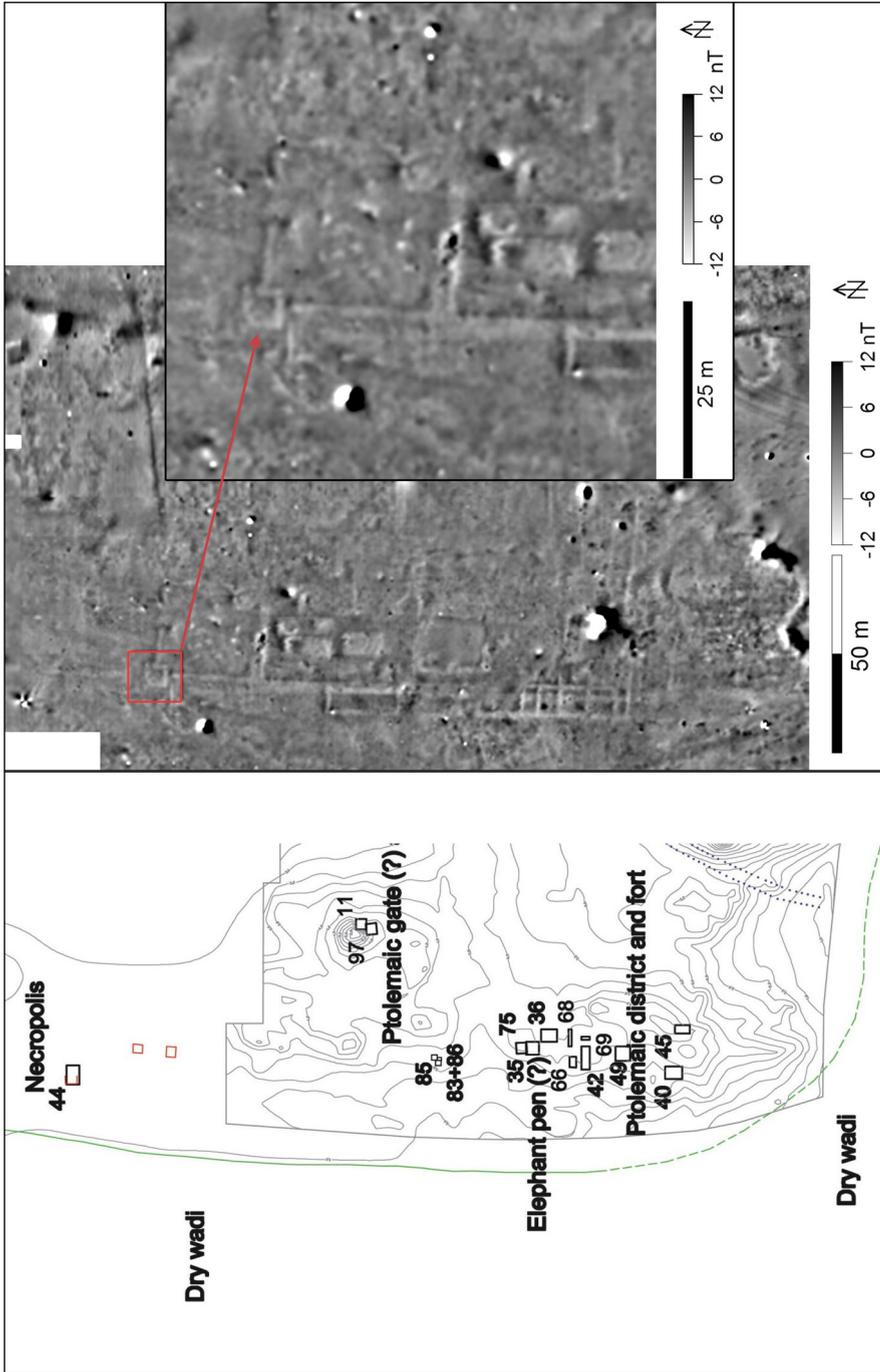


Fig. 2. Plan of the western part of Berenike, including trenches discussed in the text; right, magnetic map of this area, square marks the location of the tower in the northwestern corner of the northern courtyard of the tetrapylon (shown magnified in inset) (Processing T. Herbich, after Herbich 2007; digital rendering J. Rądkowska)

into a convenient dump for industrial waste (slag, ashes, pieces of sheet lead etc.).

The main feature in trench BE00-40 [Fig. 4] was a wall of blocks and broken chunks of gypsum anhydrite with coral heads thrown in, relatively well preserved considering the extent to which this part of the site was robbed of all building stone. This wall (039) was situated in a deep foundation trench, slightly wider than the wall itself, excavated in bedrock. Its orientation was N-S and it had a maximum width of 1.20 m. The excavators considered it as representing the second sub-phase of the first occupation identified in the trench (phase Ib), finding no architectural remains of any kind for the first sub-phase. Two thinner walls ran at right angles to wall 039: wall 026 partly already in the southern trench wall and 108 near the northern side of the trench. The latter wall was approximately one meter wide and the distance between these two walls was 6.05 m (Sidebotham, Wendrich [eds] 2007: 38-39, 38, Fig. 4-6). All three walls appear to have been contemporaneous and corresponded to either phase II or phase III in trench BE00-36 (Sidebotham, Wendrich [eds] 2007: 40).

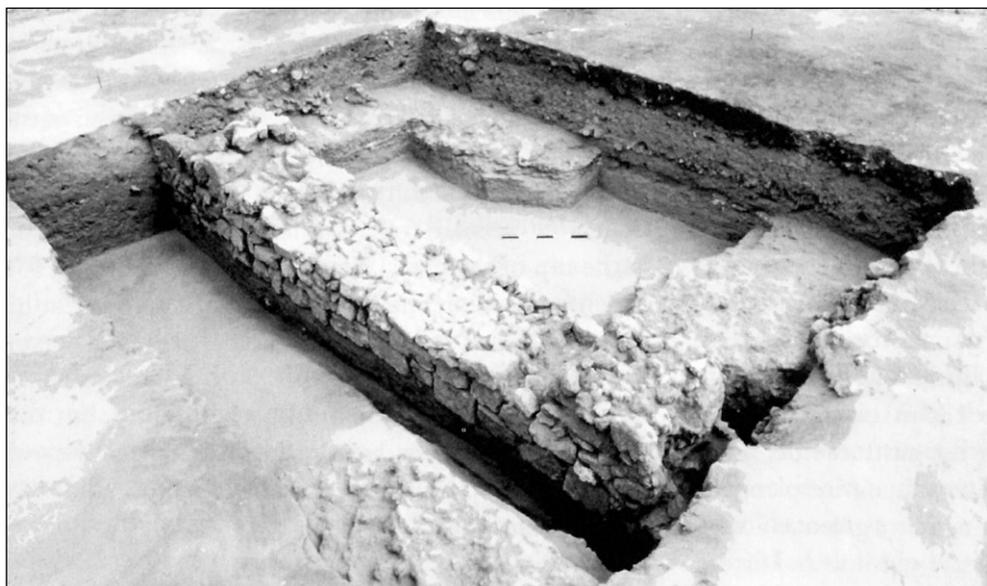
Amphora sherds recovered in huge quantities from these trenches suggested the industrial and storage character of this district back of the harbor. The dating of the ceramics placed this occupation in the Ptolemaic period. Pieces of lead sheet used, among other purposes, to sheath the hulls of seagoing ships, as well as large quantities of iron and long, copper-alloy nails suggested that ship repairs had been conducted in the vicinity (Casson 1995: 209-210; Rosen, Galili 2007: 300-307; Sidebotham, Wendrich 2002: 25-27). The immediate neighborhood of the silted up

lagoon used as a harbor and a flat sandy strip of beach within the bay, and explored in the 2011 season in a trench (BE11-71), uncovered remains of small fires and early/middle Hellenistic pottery (BE11-71).

Last but not least, a V-shaped ditch cut in bedrock was discovered in trench BE01-42 [Fig. 5] in the westernmost part of the so-called "Hellenistic industrial area" (Sidebotham, Wendrich 2002: 26, Fig. 4). There is nothing in the archaeological evidence from the ditch or from the inner wall surfaces to suggest water-related function. It was just 0.56 m deep on average, but was cut in the bottom of another shallow, but much wider trench (about 1 m deep and 1.50-2.00 m wide). It ran first N-S, then turned a corner at right angle and continued 5 m to the east (Sidebotham, Wendrich 2002: 26); a continuation of this ditch was explored in two more trenches, running northward in BE10-66 and shallowing out to the ground surface in BE10-69, tracing the ditch for roughly 10 m further to the north and 8 m to the east (Zych, Sidebotham 2010: Fig. 12). This was interpreted as a ditch surrounding a big animal pen, thus bolstering the argument for elephants being unloaded here before being herded to the Nile and downriver to Alexandria (Sidebotham, Hense, Nouwens 2008: 162-164, Fig. 7.13). The discovery of an elephant molar tooth (not tusk), identified as belonging to the *Loxodonta africana* species, not far to the north of the area with the putative animal pen confirmed the presence of live elephants in Berenike (surface find reported in Sidebotham, Wendrich 2002: 41; Sidebotham 2011b: 50; and another one in 2010, archaeozoologist M. Osypińska, personal communication). In the second phase of use, the V-shaped ditch, at least the



*Fig. 3. Storage container in trench BE00-36, seen in the foreground, cistern (035) in the upper right corner (After Sidebotham, Wendrich [eds] 2007: 33, Pl. 4-3)*



*Fig. 4. Wall (039) in trench BE00-40, west wall of the fort of the third phase (After Sidebotham, Wendrich [eds] 2007: 39, Pl. 4-8)*

western part of it running N–S, was filled in and a wall perpendicular to it, roughly 1 m wide, was raised at its eastern edge (found robbed out for the most part). This wall comprised blocks and broken pieces of gypsum anhydrite interspersed with coral heads. It cut through the southern, E–W part of the ditch at its southwestern corner and ran south into the southern trench wall. Despite structural resemblance, this wall was not the same as wall 039 from trench BE00-40.

Geophysical prospection in the 2009/2010 season of the remaining unsurveyed flat ground in the western district of the town supplemented the 1999 magnetic map of the area, providing the necessary data for a reconsideration of earlier interpretations (Zych, Sidebotham 2010: Fig. 1). A building pre-

viously interpreted as a long structure with a series of small units of industrial nature now appeared to form a large closed rectangular complex measuring roughly 150 m N–S by 80 m E–W. It seemed to have two, perhaps even three, extensive courtyards surrounded by a series of small-size rooms and furnished with some storage installations, possibly granaries/silos and cisterns. In the northern part of the complex, the magnetic map revealed the presence of a small courtyard surrounded by massive walls, furnished with at least two, but probably three towers on the north-western, southwestern and southeastern corners. The architecture imaged on the magnetic map can be interpreted as a fort in a fairly straightforward manner. Considering that the test trenches dug in the



*Fig. 5. V-shaped ditch seen from the south: BE01-42 at bottom and right, BE10-66 at top and left; state in 2010 (Photo S.E. Sidebotham)*

western part of the site as well as surface finds had provided evidence for only Ptolemaic occupation of this particular area, without any attestation whatsoever

of later rebuilding (Sidebotham, Wendrich 2002: 25–27), there was little doubt that the structures in question would be of Hellenistic date.

## OTHER HELLENISTIC CENTERS IN THE REGION

Before describing the results of current excavations in the Hellenistic part of Berenike, a brief review should be made of the state of research at other Hellenistic centers in the region [see *Fig. 1*]. Information from ancient written sources provides most of our knowledge about Ptolemaic harbor foundations in the Red Sea area (Sidebotham 2011b: 13–16). Investigations of ancient sites like Myos Hormos (modern Quseir al-Qadim) and Nechesia (most probably modern Marsa Nakari) have not unequivocally identified either the nature of the occupation or the appearance of the settlements and their sizes in the Hellenistic age. At Myos Hormos, excavated in the late 1970s and 1980s by Donald S. Whitcomb and Janet H. Johnson (Whitcomb, Johnson 1979; 1982a; 1982b), and then in 1999–2003 by D.P.S. Peacock and Lucy Blue (Peacock, Blue 2006; 2011), there is numismatic and some ceramic evidence of Ptolemaic occupation (Peacock 2011; Sidebotham 2011a; R. Tomber, personal communication to S.E. Sidebotham; Sidebotham, Hense, Nouwens 2008: 170). At Marsa Nakari, a site midway between Berenike and Myos Hormos, perhaps to be identified with the ancient Nechesia mentioned by Claudius Ptolemy (*Geography* 4.5.14–15; Cohen 2006: 338–339), explorations by an American team in 1999, 2000 and 2002 did not produce any expected data on the earliest occupation (Seeger 2001; Seeger, Sidebotham

2005). While Hellenistic material was recorded, the uncovered architecture can be dated to the early Roman and not Hellenistic period (Seeger 2001). The location of the site and its relatively small size could be an indication of early Ptolemaic occupation; a fortified space on a small promontory with the sea on two sides would have been an ideal location for a small Hellenistic fort (Sidebotham, Hense, Nouwens 2008: Fig. 7.15, 167), but more conclusive evidence is still lacking.

Some preliminary work has been carried out on some other sites, contributing evidence for the scope and variety of Ptolemaic activity in this part of the ancient world. One of these is the huge fortress of Abraç, dated to the Hellenistic and early Roman periods. The fortification lies southwest of Berenike, 50 m above the wadi floor, on the top of a flat hill that is some 161.50 m long east–west and 98.50 m wide north–south. The hill forms the edge of a great valley at the intersection of a number of wadis. The external walls of the fort reach 1.30 m in width. Inside the walls there was an inner fort just a little off center to the southwest. It was 32–33 m long east–west and 29–33 m wide north–south, the outer walls being 0.92–1.20 m thick. There were no towers. At the core of this fort was a large square courtyard surrounded on all four sides by a series of 26 rooms of different size (Sidebotham 1995; Sidebotham, Zitterkopf 1996: 372–

374; Sidebotham, Hense, Nouwens 2008: 352–353).

The site has not been excavated and no extensive surveys were carried out in the neighborhood of the fort, especially to the south and east, hence it is impossible to determine beyond doubt its function and connections with other centers. The military character of the architecture, strategic location and numerous graffiti and rock art representing camels, gazelle and elephants carved on rock faces near the fort (Sidebotham, Wendrich [eds] 1995: 99–100; Sidebotham, Zitterkopf 1996: 376) might indicate that it guarded a route from Berenike leading west to Syene (modern Aswan) and south (possibly to Berenike Panchrysia). A rock-cut temple façade of Ptolemy III at Bir Abu Safa seems to indicate a route between Abra q and the Nile at Aswan (Sidebotham, Hense, Nouwens 2008: 112–115), although the location of the site, just a few dozen kilometers to the south of Abra q could attest also to a branching of the route to the south. It is equally possible that a military establishment of this size at Abra q, served the same purpose as a similar fort at Samut (Sidebotham, Hense, Nouwens 2008: 235–236, 332; Brun, Deroin *et alii* 2014), that is, protection and control of the local gold mines and the associated settlements and water sources (Sidebotham, Hense, Nouwens 2008: 352–353).<sup>1</sup>

The large fort at Samut (69 m by 58 m) mentioned above is another military establishment from the Hellenistic period in the region (Klemm, Klemm 2012: 248;

Brun, Deroin *et alii* 2014). The fortress stood at the bottom of a wadi; it was rectangular in layout with square towers at the four corners. Inside, the towers were two long rooms that could have been staircases. A series of small units lay around a central courtyard. It was the most important Ptolemaic fort on a key route connecting Berenike with Apollonopolis Magna (modern Edfu) in the Nile Valley. In addition to being a way station, the fort here also provided security for gold mining operations in this area.

A little known site is Berenike Panchrysia (Deraheib) in Wadi Allaqi, investigated only briefly by Alfredo and Angelo Castiglioni (Castiglioni, Castiglioni, Vercoutter 1995; Bard [ed.] 1999: 198). It was a major gold-mining center from the Pharaonic to the Roman periods. Ptolemaic coins and other Hellenistic finds (Bard [ed.] 1999: 199), as well as evidence for smelting gold analogous to the traces found on the island of Kythnos in Greece, which were also dated to the Hellenistic period (Bard [ed.] 1999: 199) suffice to confirm large-scale occupation and activity in this center also during the rule of the Ptolemies.

There is virtually no information about the other Ptolemaic foundations on the coast of east Africa apart from what is suggested in the ancient written sources. Of the many unidentified or uninvestigated sites one should mention the most important: Leukos Limen, Philotera/Aenum, Ptolemais (Epi)theron (south of Berenike, perhaps near

<sup>1</sup> A mining settlement associated with the gold mines has been identified at al-Illegha, about 35 km from Abra q as the crow flies (Sidebotham, Hense, Nouwens 2008: 214, Fig. 9.1, 1995: 85–101). Local Bedouin guides have also reported another site with characteristic grinding stones for crushing gold ore in the vicinity of Abra q. Should this be confirmed, it would add to the body of evidence for the existence of a mining center near the fortress.

modern Aqiq in Sudan) and Berenike Epi Dires, but there are more (Cohen 2006; Sidebotham 2011b: 175–187). They were part of an exceptional trade network linking Egypt, eastern Africa and southern

Arabia, dealing in live elephants, ivory, gold, precious stones, frankincense and other goods coveted in the markets of the Mediterranean and the Red Sea and Indian Ocean littorals.

## THE FORT IN BERENIKE: THE ARCHAEOLOGICAL EVIDENCE

Exploration of a large structure traced on the magnetic maps of the western district of Berenike started in 2012 and should be seen as a continuation of work in the earlier trenches. The following is a preliminary summation of the evidence. A full discussion will be published in final reports from the excavations that are currently under preparation.

The first trench (BE12-83/85/86), excavated by Marek Woźniak, was located on the site of a square feature situated in the northwestern corner of the outer northern courtyard of the complex traced on the magnetic map [see *Fig. 2*]. Excavations revealed the foundations of a tower, roughly 5 m square, cut into the rock plateau (made up of sedimentary rock and fossil reef). The walls were about 0.80 m thick. Inside there was a single unit measuring 3 m by 3 m, too small for a masonry staircase, hence probably accommodating a wooden ladder that led up to an observation platform atop the tower. The stone building material had all been robbed out. Still, it was possible to examine the foundation trenches and glean from them important information on the architectural structure, building technique and dating of this feature.

The foundation of the tower was constructed inside a large “primary” trench (more than 2 m wide and about 0.80 m

deep), cut in the rock and running N–S, basically parallel to and just a few meters away from the western edge of the plateau where the rocky ground drops into a wadi. The wadi was deeper in antiquity and at least its southern end was filled by the waters of the lagoon, which reached farther inland than it does today. The foundation trench of the tower itself was 1.20–1.30 m wide and approximately 0.55–0.57 m deep. The orientation of the tower and adjoining section of curtain wall veered a little in location and direction from that of the “primary” foundation trench (recognized also on the magnetic map, Sidebotham, Wendrich [eds] 2007: 24, Pls 3-3, 3-4). This necessitated more undercutting of the trench at the southwestern corner of the tower and a corresponding broadening of its original eastern side at an appropriate angle and width in order to accommodate the foundation of the western curtain wall of the complex, which took its beginning from the middle of the width of the south tower wall. All in all, the structure could be distinguished only thanks to these alterations, combined with the observation that the foundation trenches for the tower and curtain wall were shallower than the original 2-m wide “primary” trench (presumably tracing on the ground the size and layout of the intended buildings and construction)

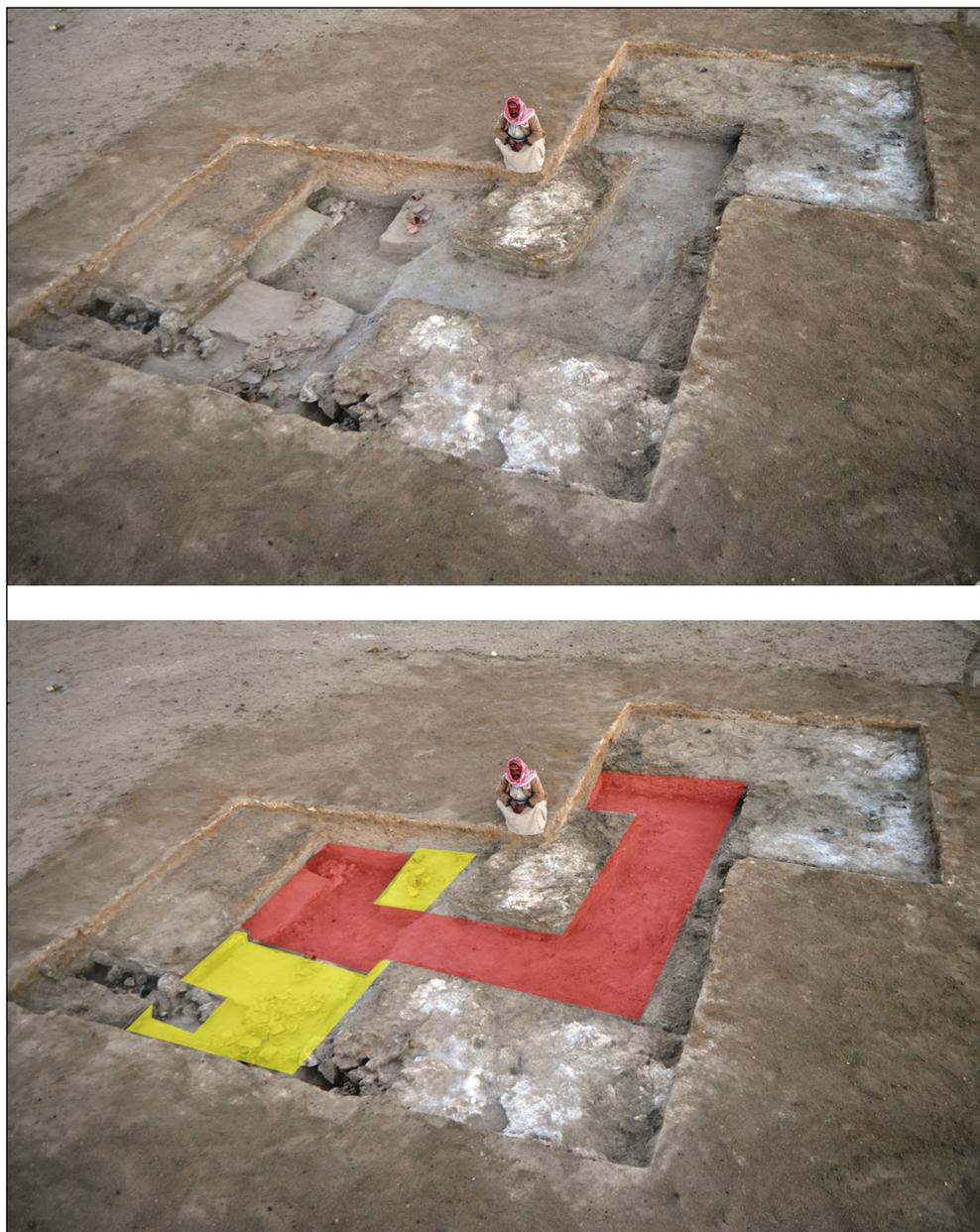
[see *Fig. 7*]. It may be assumed based on these results that the cutting of the main trench tracing the overall layout of the architecture in an entirely separate phase of the building work preceding the actual construction. Close observation of the size and course of the wide trench also indicated that farther to the south of the southwestern corner tower of the northern courtyard seen on the magnetic map, a V-shaped ditch (uncovered in trench BE01-42, described above) had been cut in its bottom (Sidebotham, Wendrich 2002: 26–27; Sidebotham, Hense, Nouwens 2008: 162–164). The ditch appears to have been the only limit of the part of plateau to the south and perhaps southeast of the fortified northern courtyard. As noted above, it may have been an animal pen (Sidebotham, Hense, Nouwens 2008: 162). The idea that it was intended for holding elephants before they were led off to the Nile was corroborated by the said find in 2010 of an elephant's molar tooth. The relative chronology of these two structures, the tower and the V-shaped ditch, make them the oldest structures in the excavated area.

The only preserved section of the wall of the towered courtyard lay south of the northwestern tower in trench BE12-83. It was part of a curtain wall adjoining the tower and was constructed in an additional cut of the main, "primary" trench and situated in its eastern side, roughly a meter wide and 0.45 m deep. This wall stood on natural ground consisting of gravel, clay and sand in this part of the plateau. The wall itself was made of large pieces (about 40 cm by 30 cm, 15–20 cm thick) of broken stone and coral heads. The arrangement of this material was rather loose, leading to the conclusion that the better quality blocks or

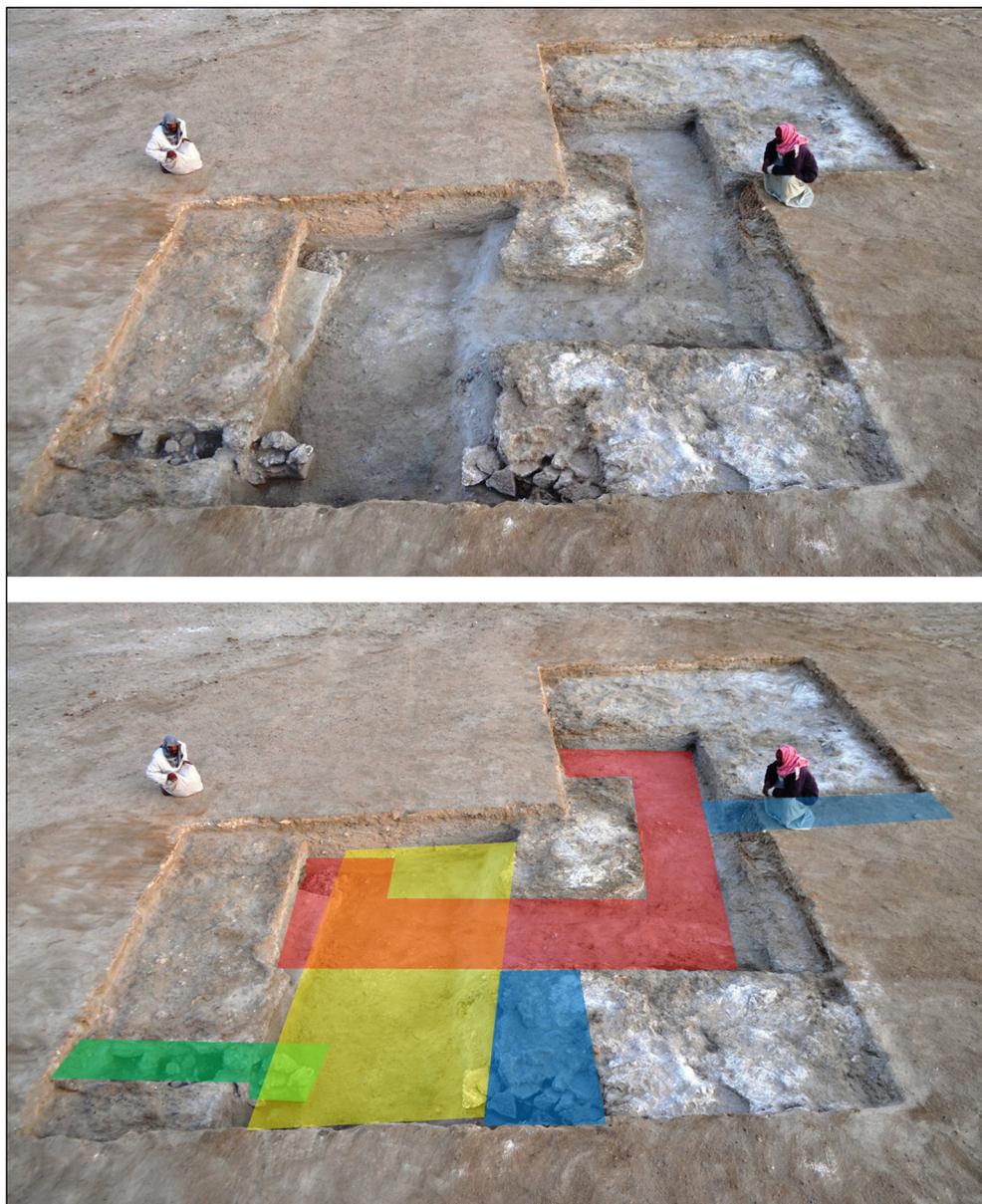
stones, preserved partly in the walls of later phases of the structure as a whole (e.g., wall 039 in trench BE00-40, see Sidebotham, Wendrich [eds] 2007: 39, 40, Pls 4-7, 4-8), had been salvaged in antiquity. The point where the curtain wall joined the northwestern tower was set directly on an uncut piece of bedrock with no foundation trench. Taken together with the slight revisions of the course of the tower foundations (due to mistakes like starting the main tracing trench too wide and at a wrong angle), it attests to rapid building and little attention to detail on the part of the first builders.

Once the tower and curtain walls had been raised, the open part of the original broad trench was backfilled to the level of the plateau surface or higher, perhaps to the ancient walking level. The fill consisted of a layer about 40 cm thick, comprising loose gravelly beach sand with large quantities of big sherds thrown in to harden it (or as trash) [see *Fig. 6*]. The sherds were dated to the 3rd–2nd century BC (R. Tomber, personal communication). Excavations also documented an amphora handle stamped with the name ΦΙΛΙΝΟΣ (Philinos), dating to the first half of the 3rd century BC (A. Dobosz, personal communication). It came from the fill of a robber trench for the south tower wall, although directly adjacent to undisturbed layers. This confirms the written sources about the founding of Berenike by Ptolemy II Philadelphos in the last years of the life of his mother Berenike I, before 280–279 BC (Pliny, *NH* 6.33.168, 6.37.108).

The leveling layer of sand yielded a few other finds: a fragmentary whetstone made of red sandstone (possibly for sharpening tools) and an animal scapula (either



*Fig. 6. Northwestern corner of the northern courtyard (belonging to the tetrapyrigion): top, after clearing of the fill from the robbed out wall trenches; bottom, the foundation trench of the northwestern tower marked in red, the "primary" trench and sand leveling layers in blue (Photo S.E. Sidebotham; interpretation M. Woźniak; digital rendering J. Rądkowska)*



*Fig. 7. Northwestern corner of the northern courtyard (belonging to the tetrapyrion) after completion of excavations (top) with the wide “primary” trench seen in the center; bottom, “primary” trench in yellow, the foundation trench of the tower walls in red, the trenches for the north and west curtain wall in blue, and fragment of later wall of coarse-grained sandstone in green (Photo S.E. Sidebotham; interpretation M. Woźniak; digital rendering J. Rądkowska)*

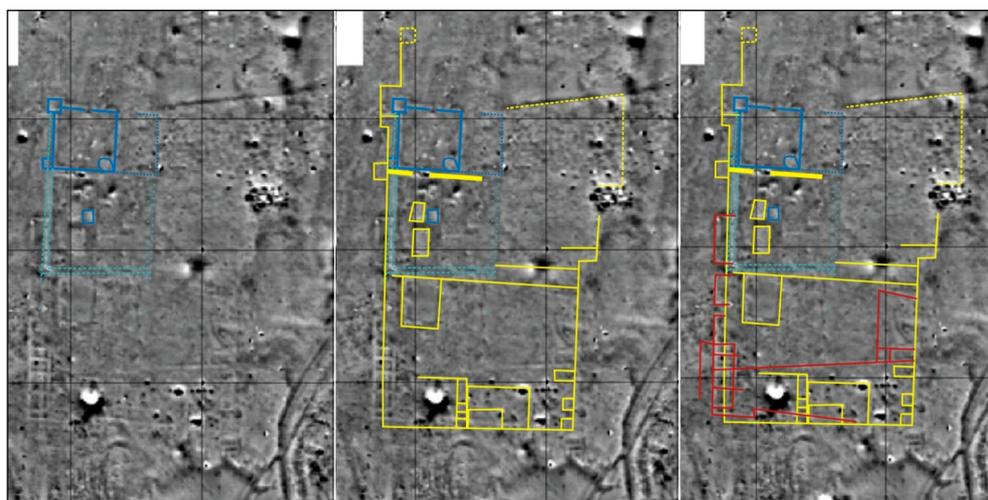
horse or camel, M. Osypińska, personal communication) with use-wear evidence on the edge, suggesting that it might have been used as an improvised tool. A well

preserved skull of a parrot fish was also recorded (this species is edible and the head is what usually remains, hence it could be taken as evidence of a workmen's meal).

## RECONSTRUCTION OF BUILDING PHASES DISCUSSION OF RESULTS

The first section of the V-shaped ditch described above (BE 01-42) [see *Fig. 5*] was uncovered in 2000/2001 (Sidebotham, Wendrich 2002: 26–27) and continued to be explored in 2010 (as trenches BE10-66 and BE10-69, Sidebotham, Zych forthcoming). It appears to have existed only in the first phase of the complex [see *Fig. 8*]. It filled up quickly (at least that section explored on the western side of the pen) and was incorporated into the western wing of a huge new fort building that began to be

constructed at this stage (see Sidebotham, Wendrich [eds] 2007: 24, Pls 3-3, 3-4; 2001–2002: 26, Pl. 4). This seems to have taken place not later than the second half or end of the 3rd century BC as indicated by the pottery assemblage (Sidebotham, Wendrich 2002: 26). It seems clear that the ditch did not extend north beyond the southwestern corner of the northern courtyard. The flat bottom of the “primary” trench in its northern sections (under the wall of the western part of the northern courtyard) indicates that it



*Fig. 8. Reconstruction of the phasing of the fort complex in Berenike based on the results of archaeological excavations and the magnetic survey of the site: blue – phase I; yellow – phase II, red – phase III (Magnetic map processing T. Herbich, after Herbich 2007; interpretation M. Woźniak with T. Herbich; digital rendering J. Rądkowska)*

was a foundation trench for the walls of some kind of building, possibly a typical Eastern Desert early Hellenistic square fort without the corner towers, as in the inner, earliest part of the Abraq or al-Kanaïs forts (Sidebotham 1995; Sidebotham, Hense, Nouwens 2008: 352, Pls 15.1, 15.2). Finally, the northern part of the complex, taking on the well known form of a *tetrapyrgion* (military and palatial construction, regular in shape, either square or round, with four, but sometimes less, towers at the corners) with small inner courtyard and at least three towers, dismantled but still recognizable on the magnetic map (Sidebotham, Wendrich [eds] 2007: 24, Pls 3-3, 3-4), clearly constitutes a separate part of a large establishment. Therefore, it is most likely that the structure built hurriedly during the first phase of the port's occupation was only a small fortress with an adjoining extensive run for animals, surrounded by a dry moat. More than likely, a rock-cut tank or cistern from trench BE00-36, plastered inside with hydraulic mortar, was connected with this earliest phase of the building (Sidebotham, Wendrich 2002: 26–27; Sidebotham, Wendrich [eds] 2007: 32, Pl. 4-1: locus 029, 33, 34, Pls 4-2, 4-3).

The early fort was subsequently rebuilt. In this second phase a much larger, rectangular part was added to the *tetrapyrgion* on the south (see Sidebotham Wendrich [eds] 2007: 33, Pls 4-2, 4-3), connected with the earlier fortified court by a fragment of the north wall. The two southern towers of the original small *tetrapyrgion* were destroyed in the process. The place of the southwestern tower was taken up by a rectangular keep jutting from the western face of the new wall, at a point where the new building met with the

old one. The wall reinforced by the tower appears to have been extended towards the north, encompassing from outside, that is, from the west, the northwestern tower of the *tetrapyrgion*. The narrow space between the two walls, that is, the curtain wall and the northwestern wall of the old *tetrapyrgion* and the new western outer wall of the second-phase fort, was partitioned into smaller units by thin divider walls of local porous stone and beachrock sandstone. A thin wall of coarse-grained limestone in trench BE12-83, southwest of the northwestern tower of the northern courtyard [see Fig. 7], may have constituted such a divider wall.

The function of the animal pen in the second phase of the fort was taken up by the southern one of two great courtyards. The northern one, still furnished with the cistern (035 in BE 00-36), must have retained mainly a storage role. Two storage bins were installed (BE00-36, loci 020 and 022, phase I) (Sidebotham, Wendrich [eds] 2007: 32, 36, Pl. 4-1, loci 020, 022). During the second phase of the occupation of Berenike's fort (BE00-36, phase II), this part of the fortified complex served a variety of industrial and repair roles (Sidebotham, Wendrich 2002: 26). Industrial operations prevailed over time, manifested by the gradual backfilling of one of the storage bins (structure 022 in BE00-36) with post-production waste (relevant layers inside this feature yielded 70 kg of lead waste, mainly slag, but also sheet metal) (Sidebotham, Wendrich [eds] 2007: 35).

Fort development in the second phase would have been connected with preparing a safe and well supplied base for increasingly intensive industrial operations, repair work and storage function

connected with supplying the outlying Red Sea Ptolemaic posts farther to the south and the transport of goods, such as ivory (Burstein 1996: 799–807; Sidebotham, Hense, Nouwens 2008: 165) or gold, for example. The early stages of subphase Ia in trench BE00-40, dated to this period of the fort's existence, definitely before the 2nd century BC (Sidebotham, Wendrich [eds] 2007: 40), reflect the situation very well; the absence of any kind of structures in the archaeological record is easily explained based on the magnetic map of the area, as this area was then to the west of the main west wall of the fort from the second building phase.

The area of trench BE00-40 was incorporated in the third building phase, dated to the beginning of the 2nd century BC, when the wall was moved a few meters to the west. A room with massive walls (039, 108, 026 in BE 00-40) roughly 1.00–1.20 m thick was cleared in the trench (see Sidebotham, Wendrich [eds] 2007: 39, Pls 4-7, 4-8, phase Ib). Material from the earlier features, destroyed or dismantled at least in part, was used in the construction of new structures, including chunks of pink hydraulic mortar coming presumably from the facing of one of the cisterns in

the northern area of the inner courtyard (used in phase II, possibly even cistern locus 035 in BE00-36), which were found in the west wall of the west wing of the new building (039 in trench BE00-40) (Sidebotham, Wendrich [eds] 2007: 40). In this phase (corresponding to phase III distinguished by the excavators of trench BE00-36), most of the operations in the fort were already associated with commercial activities. Installations that had been used for collecting water reserves or fodder for transported animals were either ultimately dismantled, supplying good building material, or abandoned and regularly filled with production waste and leftovers from repair work (presumably on ships), e.g. structures 020 and 022 in trench BE00-36.

This phase seems to have been the last in the operation of the fort. The western wing of the building, especially in the southwestern part of the site, quickly disappeared under a dump of waste pottery. The fill also yielded numerous metal fragments, both bronze and copper-alloy nails. By the end of the 2nd century BC at the latest, the fort had finally been abandoned. The ruins continued to be a ready supply of building material for the builders of the early Roman town.

## CONCLUSIONS

The architecture of the fort thus far investigated, especially the solid towers and northern courtyard in the form of a *tetrapyrion*, the closed character of the complex as a whole and the massive nature of the walls all clearly indicate its defensive nature. This corresponds to the information supplied by surviving ancient

written sources, not only the works of ancient historians and geographers, but also numerous rock inscriptions, such as those from the neighborhood of Samut on the Hellenistic road between Berenike and Apollonopolis Magna. These texts record military operations connected with the city or more appropriately in

this case, military base/harbor, right from its founding through the early Hellenistic period (until the 2nd century BC). The names of *strategoï* commanding expeditions to Berenike and further south in search of elephants are known. There is information on the manpower of these expeditions, even details concerning methods of catching elephants and their transport back to Egypt (Sidebotham 2011b: 39–53).

The topography of Ptolemaic Berenike also confirms the defensive military character of the fort. It was located on a long, flat and rocky promontory formed by a fossil coral reef buried in thick waterborne wadi gravel, clay and sand. This plateau was cut by a deep wadi just to the west of it. The southern end of this wadi is damp today, overgrown with luxuriant tamarisk bushes; in antiquity, it was most likely a marine lagoon. The shoreline of

this lagoon, largely filled in now, would have reached the southern edges of the promontory on which the fortress was standing, partly encompassing it from the east. The area to the north of it, adjoining the northern end of the promontory on the east, was a flat, sandy beach, partly submerged during high tide. The only dry land access to the fort was from the north, the road leading to the fort running along a flat treeless expanse, following the hard ridges of fossil reef underneath, similar to the reef on which the fort had been constructed. The fortifications on this side were the strongest. The original *tetrapyrgion* was located here and there are premises, suggesting that additional lines of defenses, still to be investigated, will be found to the north and east. But even without them, the huge fort of the early Hellenistic period in Berenike would have been practically impervious to attack.

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