EGYPT

The harbor of early Roman "Imperial" Berenike: overview of excavations from 2009 to 2015

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Abstract: Excavations by the American–Polish project in Berenike on the Red Sea since 2008 have aimed at uncovering and reconstructing the ancient landscape of the southwestern embayment, tentatively identified as the harbor of the Hellenistic and early Roman city, and its immediate vicinity. A review of the evidence from the excavation of several trenches in this area paints a picture of the bay—still incomplete—and contributes to a reconstruction of the cultural and economic landscape, the "lived experience" of the town's inhabitants and incoming merchants and sailors during the heyday of "Imperial" Berenike, that is, in the 1st and 2nd centuries AD.

Keywords: Berenike, Red Sea, harbor, Hellenistic, Roman, landscape archaeology, Kushan envoys, Augustus, Trajan, Domitian

Looking today at the sandy expanse of the southwestern embayment in Berenike one is hard put to imagine the bustle here at the height of a shipping season in antiquity [***Fig. 1*** top]. Vessels from as far as India and from closer in, like the southern stretches of the Red Sea, South Arabia and East Africa, standing out in the outer bay, beyond the coral-reef barrier, the goods they had carried—spices, cloth, steel and precious gems, among others—being ferried on small craft plying the shallow waters of the lagoon and inner bay. Merchants celebrating asuccessful crossing with votive offerings in the temples of their choice, then presumably rejoicing in the taverns in town or else attending to official business in the administrative quarter. Resident elites, including custom officials, shipping agents and military personnel, retiring to their opulent houses, possibly hosting visitors of high social standing, intermediaries acting directly for the Roman Emperor and, on occasion, foreign envoys traveling on behalf of their respective exotic kings. The industrious folk of the lower classes, the porters and animal keepers, craftsmen engaged in ship maintenance and other much needed trades, suppliers of food and water and anything and everything that may have been needed, scurrying about their business, making the best of the day with temperatures, especially in September, soaring into the 50s°C.

The ebb and flow of life in the ancient emporium would have followed closely the trading cycle, which was in turn linked integrally with the monsoons. Twice in the year the population of Berenike would have swelled significantly: in the spring when the laden ships sailed in and again in the fall when they left for the trip to India. Agents, merchants, intermediaries, caravan leaders, animal keepers, and guard details would have filled all the hostels the city had on offer, perhaps putting up tents in the nomadic style. Sailors and ship captains from the ships on the roadstead would have visited the town and gone about the business of cleaning and repairing their ships after a long journey in and fitting and supplying them for the journey out. Then there would be the various fortune seekers and entertainers, magicians and harlots that surely made their appearance in a busy harbor. And the indigenous peoples living in the mountains of the Eastern Desert, nomadic or semi-nomadic, trading with the 'city people' on the coast, much like the 'Ababda Bedouin of today.

In between these periods of activity were long months of waiting, a hot, sleepy, presumably uneventful existence in the summers and cold rainy winter months, fraught with the danger of flash floods sweeping down from the mountains of the Eastern Desert and escaping the natural channels of the wadis that spread out their pincer-like grip around the location of the town. Being on slightly higher ground, the houses in the town to the east of the harbor bay would have been protected, but the bay itself would have been washed right out into the lagoon, the surging water carving deep gullies in the ground, carrying anything and everything in its way, leaving behind layers of sand.

Indeed, there is evidence of such a layer, almost a meter deep, recorded in a number of trenches in and outside the bay (see Kotarba-Morley 2017b; 2017c, in this volume). Judging from its position in the stratigraphic record, this steely blue sand predates the Augustan age, attesting to a calamitous event of this nature perhaps in the 1st century BC. It is not tantamount to Berenike being deserted at this time. In the last quarter of the 1st century BC, it may have been a fairly quiet fishing village, but one that offered enough amenities as a natural landing place for ships of different size, sheltered from the winds and currents, and as a source of food, water and fuel supplies for passing ships. In other words, it had the tradition behind it and the investment potential to attract Roman trading under Augustus.

BERENIKE TROGODYTICA: FOUNDATION AND TOPOGRAPHY

Ancient Roman written sources indicate that Berenike Trogodytica was established as one of a network of similar harbor sites extending south along the western coast of the Red Sea, from the southern reaches of Egypt to East Africa (Sidebotham 2011). This was an economic and military project envisioned by Ptolemy I and his son Ptolemy II, engineered most likely by the latter, a venture that must have been driven by knowledge of this region and its potential amassed by the Egyptians ever since they

started exploring it in the 2nd millennium BC. A distinct part of this undertaking was a daring bid to build the Ptolemies' own "armored tank" force of elephants, replacing the Indian elephants, which they could not have because of the hostile relations with the Seleucid kingdom, with the African variety. This ingenious idea was based on the assumption that these animals could be captured and transported up the Red Sea from East Africa to Egypt, where they could be trained for the war effort.

Underlying the elephant venture, however, was an even more important and lucrative business, that is, a thriving South Arabian trade in mineral resources and human slaves, as well as spices and frankincense, which provided a strong stimulus for developing harbors and landing places along the Red Sea coast. With early Roman Imperial trade in *luxuria* from the East reaching exorbitant levels, the need for an effective working harbor to deal with the commercial aspects of the process was a simple economic necessity (Fitzpatrick 2011).

In this context, one may speculate about the incentives that led to the establishment or perhaps rather development of Berenike as a major Roman entrepôt in the 1st century AD. There is no reason to think of the site as deserted in the so-called Augustan period, that is, after the conquest of Egypt by Augustus, and every reason to assume that it had a nicely thriving, even if modest fishing harbor. Indeed, a recent find of a shattered stone stela bearing a cartouche of the Twelfth-Dynasty pharaoh Amenemhat IV (Hense, Kaper, and Geerts 2015; Hense and Sidebotham 2017) has suggested a date more than 1500 years earlier for the generally accepted origin of settlement in this location. The stele fragments were found in a pile of fragmentary inscribed stones and architectural elements, collected in a 5th century AD context in the courtyard of the Great Temple of Berenike. Rather than being brought to the site from some as yet unidentified location, either as building material or ship ballast, a stela of this particular Egyptian pharaoh was much more likely to have been set up intentionally in commemoration of one of the southward-bound expeditions of this king passing through Berenike, in similarity to the celebrated Marsa Gawasis finds from a few hundred kilometers further up the Red Sea coast (see, e.g., Bard and Fattovich 2007; 2011). Should this be true, then it can also be speculated that there was already a station of some significance located at or near the future Berenike, possibly even on the site on which the Great (Sarapis) Temple was built more than a millennium and a half later.

Geological and geoarchaeological investigations conducted to date at the site (summed up in Harrell 2017 and Kotarba-Morley 2017a; 2017b) have contextualized the Berenike harbors within the landscape and discussed them in the light of the newest set of evidence (Kotarba-Morley 2017d; see also Sidebotham 2008). The location was well protected from prevailing northerly winds by Ras (Cape) Benas extending far into the sea to the north of the site. Ships were either anchored in deep water beyond the coastal coral reefs or they entered the lagoons formed at the mouths of two wadis forking just northwest of the site and surrounding it with their beds. These wadis today are silted up and an alluvial flood plain (*sabkha*) extends several dozen meters from the original shoreline into the sea. Excavations as well as coring research have demonstrated, however, that

Fig. 1. Looking across the southwestern embayment today: top, view looking east to the lagoon beyond the nebkas lining the shore, note concentrations of larger shells and fossil coral heads in an otherwise sandy stretch of ground; inset, natural shore along the southern side of the lagoon; bottom, view south from the ridge toward the filled-in lagoon at the mouth of the wadi (Photos I. Zych)

the sea level in historical times (in the Ptolemaic period) has changed insignificantly compared to the present (Kotarba-Morley 2017a: especially 134–135; 2017d: 216). The locality consisted of a plateau set off by the southwestern wadi, which skirted it on the western side. Rising east of the plateau, separated from it by a stretch of sand apparently filling a deep trough in the original surface, was a coral ridge forming a crescent-shaped formation that opened toward the sea to the south and southeast. This is the southwestern embayment which encompassed a natural sandy beach. On the opposite, eastern side of this bay the fossil reef created yet another low plateau already at the sea edge, covered with alluvia and sand. Here the Great Temple was raised (presumably in a sanctified location, possibly on the site of an earlier temple(s), see, e.g., Hense 2017, in this volume) and around it, the presumed fishing village and commercial town of the Ptolemaic age. It was easily defended by a fortified wall that cut across at the neck of the promontory, incorporating a large stone fort and related architecture on the western plateau at the edge of the wadi, which must have been deeper at this time, acting perhaps as a kind of moat (Woźniak and Rądkowska 2014; Woźniak 2017, in this volume).[1] The plain extending north of the defensive wall would have constituted a natural stopover for caravans arriving to Berenike from the Nile Valley via the Eastern Desert trails. The area was certainly occupied by craft workshops, especially in the western part (see Sidebotham and Zych forthcoming).

There is no archaeological evidence to date for the elephant harbor of the Ptolemies, that is, the port of the mid to late 3rd century BC, although it may be speculated that the animals were unloaded directly onto the beach. All that is actually needed for the operation is a stretch of sandy beach where the wide and flat-bottomed barges (as the special *elephantegoi* ships for carrying these animals are imagined to have looked, although none has ever been found) could have landed and been secured in place with a ramp to offload the wild animals. The only viable place for this landing would have been the natural beach within the so-called southwestern embayment, in the immediate vicinity of the fort and the presumed elephant pen (Sidebotham and Wendrich 2002; 2007) [***Fig. 1*** bottom].

ARCHAEOLOGICAL EXCAVATION SEASONS 2009–2015

The southwestern embayment, which is the modern term for this apparently partly natural and partly manmade feature (see Herbich and Zych 2017; Kotarba-Morley 2017b), was the main objective of the investigations of the American–Polish project of the University of Delaware and the Polish Centre of Mediterranean Archaeology University of Warsaw, which took over in 2008 from the American–Dutch project that had investigated the site from 1994 to 2001. In the course of eight seasons, carried out through 2015, the Project excavated some 13 trenches in different parts of

[1] The Hellenistic remains of the military fort are being studied by Marek Woźniak under a grant from the National Science Center of the Republic of Poland (UMO-2015/17/N/HS3/00163).

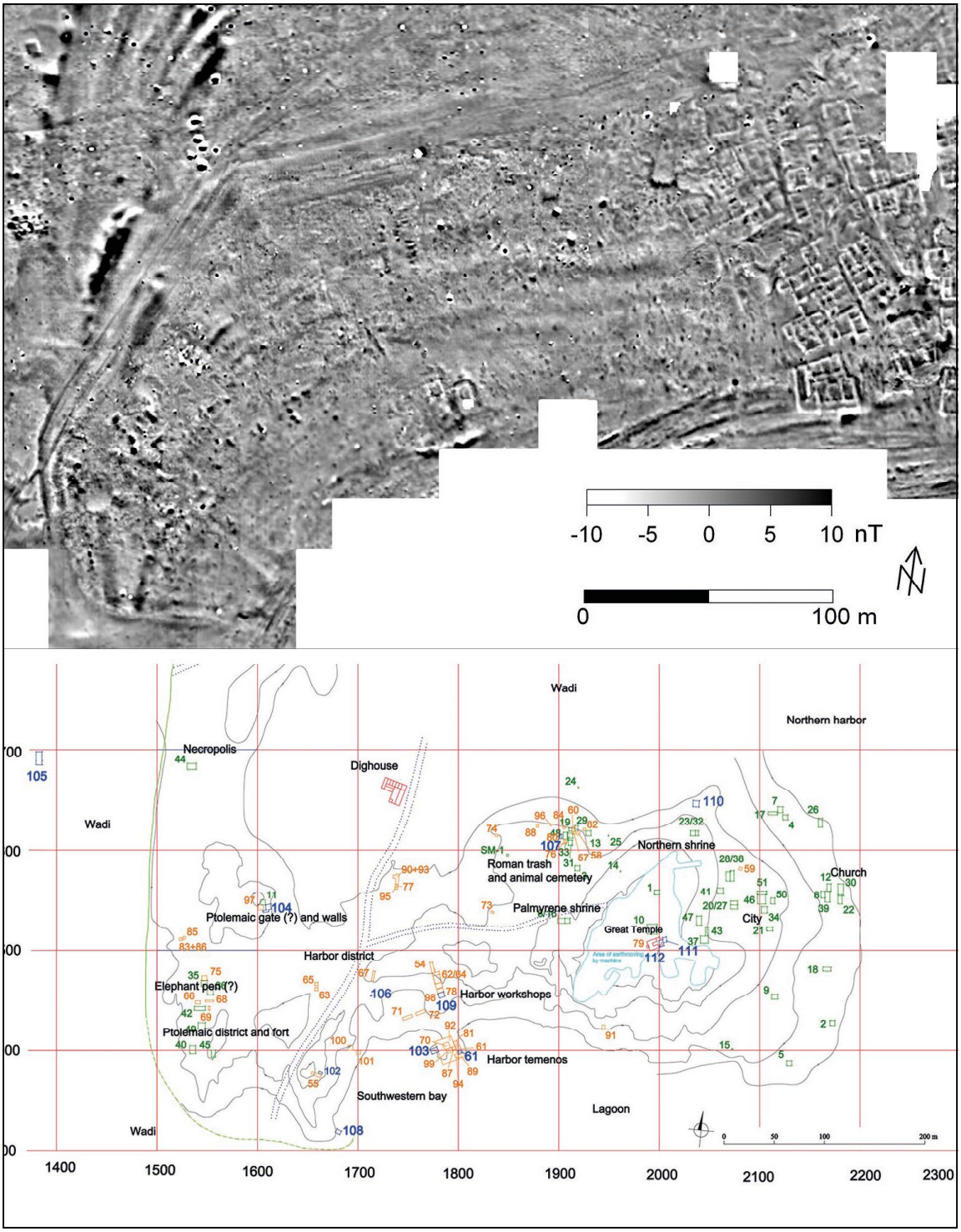

Fig. 2. Plan of the southwestern embayment, indicating the location of trenches discussed in the text; top, magnetic map of this district for comparison (PCMA Berenike Project/plan B. Wojciechowski, updated J. Rądkowska; geophysical processing T. Herbich with D. Święch, 2010)

the bay (altogether approximately 260 m^2 of ground surface) (generally, Sidebotham et al. 2015; Sidebotham and Zych 2011; 2016; 2017; forthcoming; Zych et al. 2016). The main purpose was to recognize the stratigraphy in this feature and determine its landscape and the nature of its operation as Berenike's chief harbor.

The Project started with exploring the lunate-shaped ridge around the embayment in three places along its perimeter [***Fig. 2*** bottom]. Trenches were traced following minute examination of the results of a magnetic survey of the area, carried out mainly in the 2010 season with some extra work on the fringes in later seasons (see especially Herbich and Zych 2017) [***Fig. 2*** top]. Part of the reason behind the location of some of the trenches was to test the observed magnetic anomalies in an effort to contextualize the survey results within the specific conditions of the site. Trench BE09-55 was dug at the southwestern end of the ridge, where it starts to turn in to the east, at the highest point, which reaches here just over 5 m ASL; another trench, BE14/15-102, was located immediately north of it (separated only by a baulk), surprisingly finding no continuation of features from the first trench. Another section of the ridge was tested at mid-point of the crescentic arch in trench BE10-67. Trenches BE09/10-54/62/64 started with exploring the northeastern end of the ridge

Fig. 3. Trenches BE11-71 and BE11-72 in enfilade in the middle of the southwestern embayment, looking east, toward the main city mound (the highest point is the archaeological dump next to the Great Temple) (PCMA Berenike Project/photo I. Zych, 2011)

Fig. 4. Trench BE15-108: furnace in the beach area (PCMA Berenike Project/photo I. Zych)

where it appeared to join what turned out to be a natural rock path leading down into the bay. The discoveries in this trench, which included a well-preserved wooden ship-hull frame and dozens of meters of coiled mooring rope, prompted three more trenches, BE11-78, BE14-98 and BE15-109, to be dug in enfilade, extending south alongside this pathway. Within the embayment, trenches BE11-71 and BE11-72 were placed over a feature that looked on the ground (and in satellite images) like a typical entrance to a built harbor basin. Trenches BE14-100 and BE14-101 in the western part of the embayment tested for remains of a large building suggested by the layout of magnetic anomalies. The southernmost trench excavated by the Project, BE15-108, was located apparently already

Fig. 5. Trench BE11-71: Hellenistic/Roman bowl, on the ground-level of Augustan-age coral-head architecture (PCMA Berenike Project/photos S.E. Sidebotham)

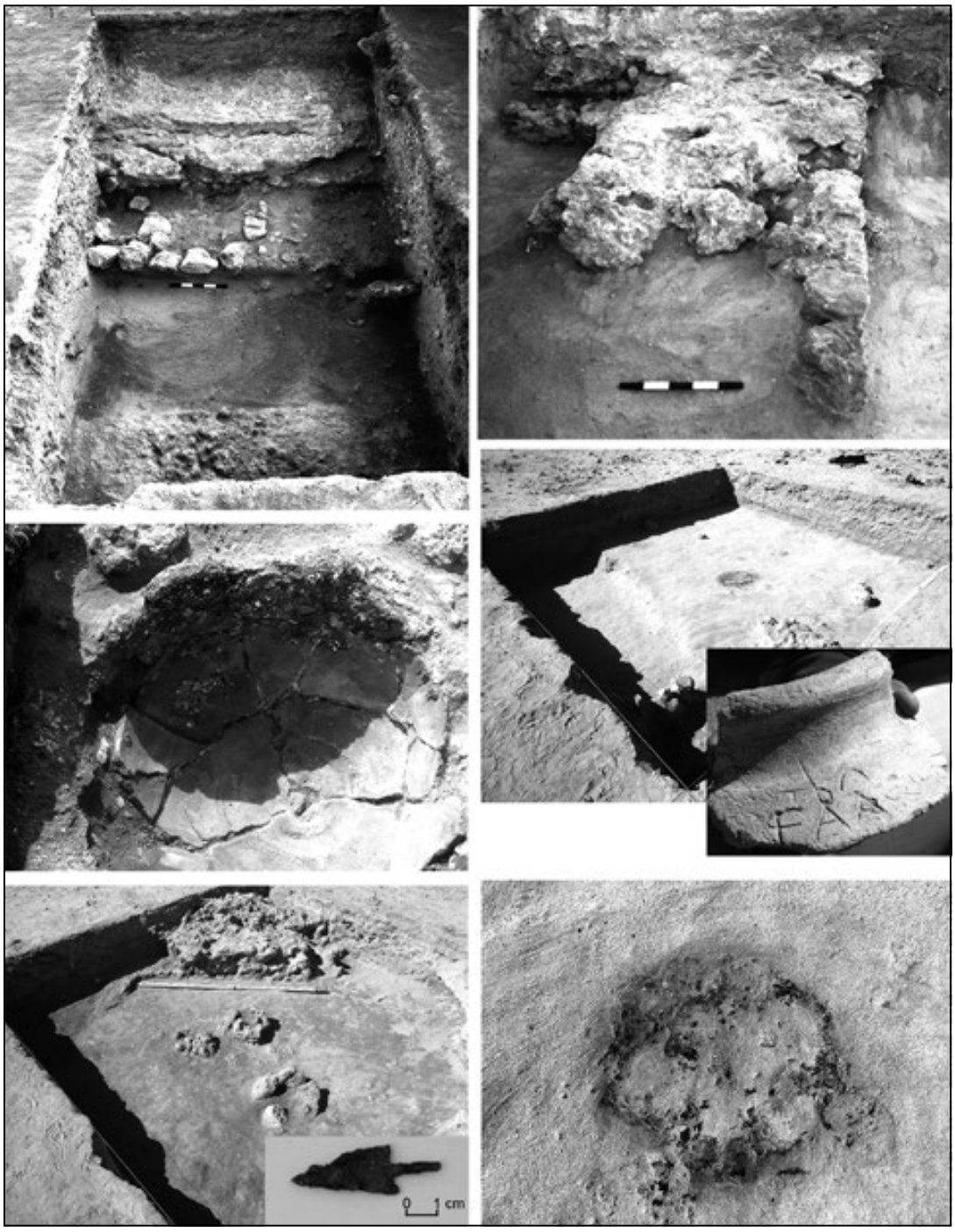

Fig. 6. Trenches inside the embayment: top and center left, BE11/72, looking east and top view of pithos (caulking pit?); top right, BE11-71, looking southwest, coral-head architecture; center right, BE14-100, stub coral-head walls and charcoal circle; inset, jar with graffito; bottom right, charcoal patch from BE14-100; bottom left, BE14-101, fragment of wall and small ovens; inset, iron arrowhead (PCMA Berenike Project/photos E. Nieto Breogan, S.E. Sidebotham, I. Zych)

on the bay shore, just beyond the end of the lunate-shaped ridge. A small probe near the top of the ridge, BE15-106, was dug for the express purpose of collecting samples for archaeobotanical analysis by flotation. Finally, one of the houses on the eastern shore of the bay was explored in BE13-91.

The two trenches, BE11-71 and BE11-72, both 2.50 m wide and 10 m long, proved beyond all doubt that the long features extending from the lunate-shaped ridge and apparently sectioning the embayment on the inside, observed clearly in satellite imagery and earlier interpreted as possible wharfs inside the harbor basin, had nothing to do with any kind of water facility. Not the least because they were from 3 to 5 m ASL. A ground survey of the area had recorded concentrations of larger broken coral heads, shells and pottery sherds covering these embankments on slightly higher ground, contrasted with the finer sand fill in the hollows between them and further south in the embayment, containing only very fragmented small pieces of corals, small shells and practically no artifacts. Moreover, based on the results of magnetic prospection in the southern part of the embayment, this area should be interpreted as shallow water at the beach edge. The excavation in BE11-71 reached the natural beach surface of early Ptolemaic times (mid-3rd century BC), thus establishing the sea level for this period. It also recorded a meter-thick layer of sand underlying the 1st century BC/1st century AD strata (conveniently dated by a whole bowl found *in situ*, see ***Fig. 5***), attesting to a fairly cataclysmic flash-flood incident that took place sometime in the 1st century BC (see Kotarba-Morley 2017b). The bowl was found within architecture constructed of broken coral heads, consisting of walls of different thickness [***Fig. 6*** top row], many fairly thin, hence probably designed as a base for upper sections and roofs made of rather perishable materials, like palm matting. Floors included simple sand surfaces and cobbled pavements, apparently connected with industrial activity of some kind, as attested by the bottom parts of a large pithos or amphora containing traces of a whitish substance [***Fig. 6*** center left], found in two successive phases. This installation is suggestive of ethnographically attested Omani practices of cleaning the hulls of their seafaring ships of barnacles and caulking them anew after each sea journey, even of just a few months (Zych et al. 2016: 330 note 2). For this purpose, lime was prepared from burnt sea shells mixed with animal fat. While the whitish substance could not be tested in laboratory conditions, it is possible that the area was intended for just such activities.

The magnetic survey traced a large regular building in the western part of the embayment. Testing in trenches BE14-100 and BE14-101 contributed to an improved understanding of how to interpret magnetic anomalies in the specific conditions of the Berenike site. For instance, an anomaly that looked very much like a stone building wall turned out to be the robber ditch left after the stone had been salvaged for reuse; the salt-crusted fill of the ditch gave a misleadingly clear result; several other architectural 'ghosts' of this kind have since been recorded by the Project [see below, ***Fig. 22***]. The identity of this building was not established, apart from it being a structure of substance [***Fig. 6*** bottom left and center and bottom right]. It yielded an arrowhead (not a frequent find from early Roman strata) and an assemblage of pottery, including a jar with a graffito on its

neck, that has been dated generally to the 1st–2nd century AD. Small furnaces in an open space suggest the presence of a courtyard where household activities took place. The apparent dismantling of its walls seems to correspond to site-wide evidence of major building activity in the early Roman period, consisting of quarrying the derelict ruins in the western part of the site for suitable stone. It is at this time that the Hellenistic city wall and large stone fort on the western plateau were apparently dismantled down to the ground (Woźniak and Rądkowska 2014; Woźniak 2017, in this volume). The charcoal patch on the level of the dismantled wall in trench BE14-100 may well be evidence of bread-baking [***Fig. 6*** bottom right].

The southernmost trench excavated in the area of the embayment was BE15-108. It was located already on flat ground at the very end of the lunate-shaped ridge, right by the presumed mouth of the wadi where it entered the lagoon. The trench yielded evidence of secondary metalworking, including a furnace [see ***Fig. 4***], as well as what appears to have been a large wooden chest hammered together with long iron nails; this chest was apparently burned on the spot. Among the artifacts recovered from the trench was a bone ear- or lip-plug, the first of its kind from the site. The date of the material from the trench fell broadly in the early Roman period.

Close to the building tested in trenches BE14-100 and BE14-101 is the highest-rising part of the lunate-shaped ridge surrounding the embayment. Excavation of trench BE09-55 revealed a platform-like structure with cobbled surface [***Fig. 7*** top right], well-dated by a late Flavian almond-embossed glass beaker, which was found inside a pit sunk in the floor and lined with a large amphora body (Kucharczyk 2011: 98) [***Fig. 7*** bottom and inset]. Stacked against the side of this platform and piled on top was rubble from an apparently domestic context, containing a pair of loaded dice among others (Zych 2011: 149 No. 87b, Fig. 12-83; for the context, Sidebotham and Zych 2011: 48). The pottery assemblage was rather more luxurious in nature, including fine wares, as well as sherds of South Arabian jars with monograms of the Hadramauti kings, dated to the 1st–2nd century AD, possibly into the early 3rd century AD (Zych et al. 2016: 331) [see ***Fig. 27***]. Excavation of trench BE14/15-102, immediately to the north of BE09-55 and separated only by a meter-wide baulk, failed to uncover any continuation of these structures. Instead, it yielded two fine cameos from the upper layers of domestic rubble [see ***Fig. 25***]. Both trenches revealed evidence of major water flows carving deep gullies in the softer rubble deposits. Observation of similar modern erosion of trench walls and backfilled trenches during the more violent winter rains has led the excavators to suggest the occurrence of such events sometime after the 3rd century AD, especially as other evidence from the main city mound also proves regular flash flooding during the 4th and 5th centuries AD (J. Zieliński and J. Trzciński, personal communication, 2013).

Underlying strata in BE15-102, undisturbed by erosion, produced a series of small simple furnaces, apparently for secondary metalworking in copper. They should be dated to the turn of the 1st century BC/1st century AD, possibly earlier (Oller Guzmán forthcoming).

The two other trenches excavated on top of the lunate-shaped ridge, both 2.50 m wide and 10 m long, also revealed

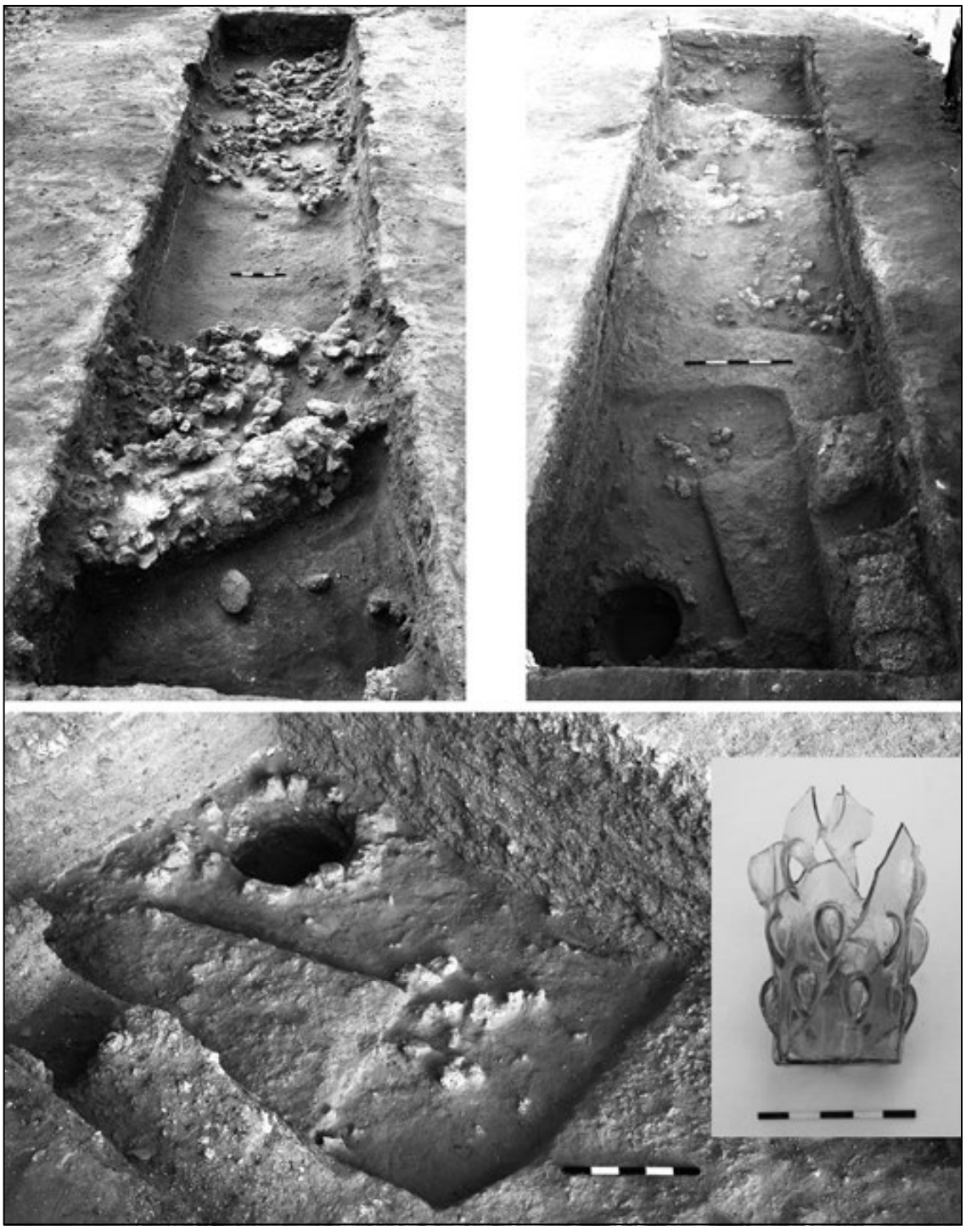

Fig. 7. Trenches excavated on the crescent-shaped ridge: top left, BE10-67, looking southeast with fossil coral-head architecture on top of the ridge; top right and bottom, BE09-55, fossil coral head architecture and pit which yielded an almond-embossed glass beaker (PCMA Berenike Project/ photos S.E. Sidebotham)

Fig. 8. Trench BE09/10-54/62/64: looking south, light architecture with matting and cedarwood feature; further south, coral-head cells for storing shipping accessories; inset, huge burning area and ashes (PCMA Berenike Project/photos S.E. Sidebotham)

Fig. 9. Trench BE10-62/64: top view of the harbor stores edging onto the hollow full of burned ashes (PCMA Berenike Project/photo S.E. Sidebotham)

Fig. 10. Trench BE10-62/64: collapsed partition wall of matting (PCMA Berenike Project/photo S.E. Sidebotham)

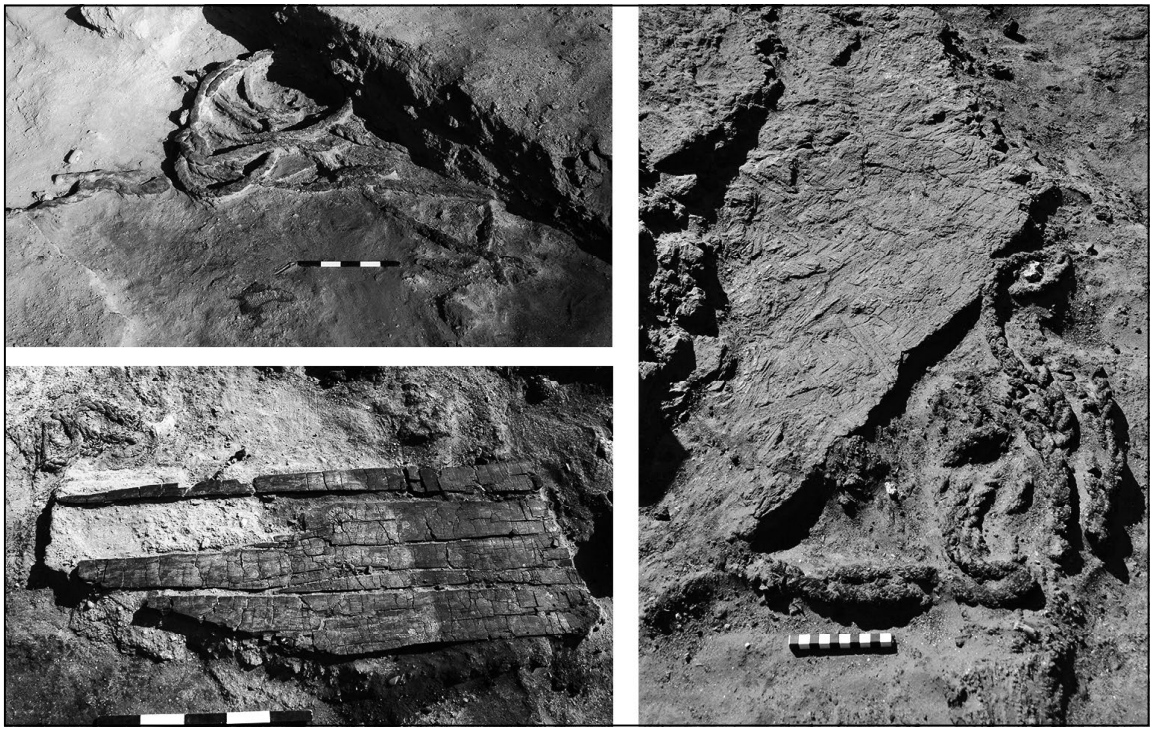

Fig. 11. Trenches BE10-64 and BE15-109: coils of mooring rope and shipping hull planks; right, expanse of burnt matting and baskets plus fuel wood (PCMA Berenike Project/photos S.E. Sidebotham)

Fig. 12. Trench BE12-78: top view looking northwest; on right, path following the rocky ridge down to the beach, back of the stores; on left, meter thick accumulation of fine black ashes and burned wooden material (PCMA Berenike Project/photo S.E. Sidebotham)

manmade structures. In BE10-67, walls of broken coral-heads were recorded, but the exact nature of the structures was not identified [***Fig. 7*** top left]. The pottery assemblage placed the occupation here squarely in the 1st–2nd centuries AD. Culturally sterile layers were not reached. The other trench, BE09-54, revealed a sophisticated floor surface made of resin-poured tamarisk twigs and cobbles. This section, erroneously interpreted in early reports as part of a waterfront, was associated with a solid cedar-wood post and some nondescript cedar-wood framing that could suggest a structure of some kind [***Fig. 8*** and inset]. Successive layers of matting, mixed with evidence of domestic occupation, including chicken and rat bones, indicates that at least food was consumed in the structure lying atop the lunate-shaped ridge in trench BE09-54.

Further south of this structure, excavations for a distance of some 40 m revealed a series of rectangular compartments divided by low walls of broken coral heads [***Fig. 9***], which served as bases for the upper parts of walls made of perishable material, palm-leaf matting for instance [***Fig. 10***]. These units appear to have been open to the west, toward the embayment, their back aligned with a rocky ridge that served as a pathway down into the harbor bay. They seem to have served as storage for ship-related accessories, among others, coils of thick mooring rope of palm-fiber, pieces of thinner rope, basketwork, pieces of fuelwood and branches, several kilograms of broken obsidian [see ***Fig. 24*** left], but most interestingly pieces of wooden ship hulls, some planks more than 3 m long and joined with the characteristic mortise-and-tenon technique. There was also a wooden ship frame, preserved complete (Zych et al. 2016: 329) [***Figs 8, 9, 11***].

The slope west of these compartments is covered with a sizable deposit of extremely fine ashes, its thickness reaching almost a meter level with trenches BE12-78 and BE14-98, thinning out toward the north and south [***Fig. 12***]. The fine ashes are spread in swirling tongues of black at least 20 m to the eastern end of trench BE11-72. The conflagration was very strong considering how fine the ashes are and the material that fueled it was quite homogeneous, leaving no evidence on record. It also seems to have been controlled to some extent, the wooden remains and rope in the stores frequently being burned only on one side, the one nearer the fire on the west. The reason for this conflagration and whether it was intentional or not continues to defy interpretation (one idea is that it was a rubbish dump that was set on fire, another that it was a charcoal-burning pyre, assuming that charcoal was after all among the requisite ship supplies). Dating evidence from the compartments indicates functioning in the later 1st–early 2nd century AD, no later than the end of the 2nd century AD. After that the area was evidently deserted, never to be used again.

Two probes dug below the layer with the ship-related remains, one just west of trench BE09-54 and the other in the northwestern corner of BE15-109, uncovered in the former case a coin of Ptolemy IV Philopator (221–205 BC) (Sidebotham 2017: 316, No. 19) and in the latter, a series of *Pinctada* shells, laid flat, possibly representing leftovers from a meal (Zych et al. 2016: 330–331 and Fig. 10). The latter context should be dated to the 1st century AD; in the case of the former one, it shows that the embayment must have been used

from the start of the Hellenistic occupation of the site.

There is a tendency when discussing the southwestern embayment to overlook the fact that the bay actually extended eastward, the lunate-shaped ridge meeting up with higher ground which then ran in a gentle curve to the east and southeast. The magnetic map of this quarter, which is a series of sand-covered small mounds rising in the general direction of the main city mound, showed a dense quarter of rather large houses with courtyards, separated by narrow alleys, descending straight down to the water edge. There were no waterfront facilities here, no wharves or anything except the beach stretching west. Testing in the entrance to one of the houses (trench BE13-91) revealed only late occupation, from the 5th century AD, but the date of the original development of this quarter cannot be determined without further work. The house was built of broken coral heads [***Fig. 13***], but considering the mounting evidence for the use of coral heads for construction also in the early Roman period in Berenike, it cannot be used as firm proof of its dating.

Observation of the magnetic anomalies recorded within the southwestern embayment reveals a division into two parts. All along the inside of the structure that is now concealed under the lunate-shaped ridge, for approximately 100 m in the direction of the lagoon, the ground is peppered with anomalous readings [see ***Fig. 2*** top]. One should disregard the heavy black arching anomalies to the northwest, which are believed to be natural and not anthropogenic. The black streaking lines visible at bottom right should also be interpreted as a record of the original shore with fossil

Fig. 13. Trench BE13-91: example of fossil coral-head architecture on the western shore of the main city mound, view looking north (PCMA Berenike Project/photo S.E. Sidebotham)

reefs long before the historical period. It follows, however, that the 40-m-long anomaly, heavily black with a white underpinning on the northern side, assuming that it, too, belongs to the original coastline, may have formed a wave-notch (see Kotarba-Morley 2017b: 149 and Fig. 5-3, 2017d: Fig. 6-2). The architecture on the eastern side of the embayment is easily traced on the magnetic map and there can be no doubt that the two structures observed on the map just above the said feature (and already proved in excavation) were stone buildings as well [***Fig. 14*** inset]. It is apparent even to an untrained eye that the zone about 50 m wide stretching in a curve on either side of the two structures is "quieter" from a magnetic point of view. The ground survey conducted in this area also demonstrated a difference between the two zones, the "quieter" zone having very little and very fragmented pottery and only small shells and corals, none of the big broken coral heads used for building nor the big shells of consumer use for the inhabitants of Berenike. The assumption is that this zone was under water in the 1st and 2nd century AD, when the embayment was in use. Multiple arching anomalies traceable between the two zones may reflect the gradual infilling of the bay, the emerging *sabkha* flats gradually pushing back the water of the lagoon. Dating these processes is difficult apart from saying,

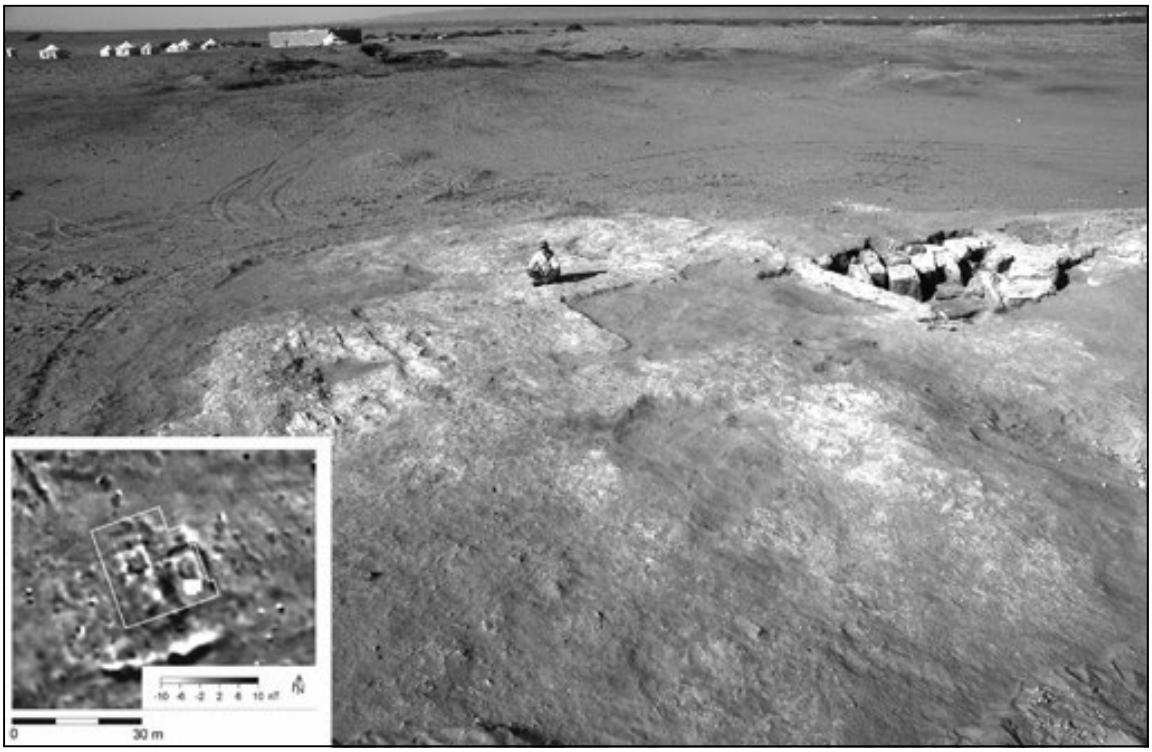

Fig. 14. Trenches BE10-61 and BE10-70: the harbor sanctuary in the first season of excavation; top, view of the late shrine looking west with the Eastern Desert mountains in the background; bottom, top view of the melted gypsum anhydrite patches around the Square Feature, looking north toward the dighouse and archaeological camp; inset, magnetic image of the harbor sanctuary (PCMA Berenike Project/photos S.E. Sidebotham, I. Zych; magnetic map processing T. Herbich)

based on the archaeological evidence, that they post-date the functioning of the embayment in the early Roman period. Further study, especially integrating the results of the geoarchaeological coring and georadar survey by Kotarba-Morley, may answer many questions. Even so, at this point, it is possible to comment on the appearance of the feature noted at the southern side of the embayment, in the middle of it, that is, if we assume that the bay actually reached the main city mound on the east.

This feature, if one looks carefully, has the shape of an irregular 40 m by 30 m island amidst the "quieter" zone around it. There may have been a path leading down from the lunate-shaped ridge (note the darker hint of a stepped line extending northwestward from the island) and this anomaly corresponds roughly with the rock path discovered in the trenches dug along this line in this part of the embayment. The two buildings observed as squarish anomalies of the Earth's magnetic field are located on the eastern side of this island, whereas the anomalies on its western side cannot be easily interpreted. Of the two structures, the eastern building has been excavated completely (trench BE10/12/13/14/15-61) and it is a late shrine, used in the late 4th and 5th centuries AD (Rądkowska and Zych forthcoming a; forthcoming b). It is clear by now that the users of this shrine salvaged artifacts from the ruins (like inscribed stone altars and religious paraphernalia) for their purposes, but they also actually reused parts of older architecture, built of stone blocks and still standing, working them into the tissue of their new structure made of broken coral heads.

Unlike the late shrine the structure west of it was not visible on the ground when excavations started. The gypsum anhydrite blocks, of which its wall were built, had melted as a result of the humidity, forming an unshapely white patch in the sand everywhere except for the square sand-filled interior [***Fig. 14***]. Tedious and patient brushing and hacking at the white surface ultimately revealed four lying walls (BE10/11-70). Two of these, the northern and the western one, appear as in a pop-up cardboard box [***Fig. 15*** top], the east wall is not as evenly laid out and the front wall, on the south, was also disturbed when it fell. Early references to this structure as "sunken" were misleading as it is now clear that it was not sunken in any way. However, there is every reason to consider the ground level on the Island, and consequently also the threshold level in the entrance to the "Square Feature", to have been little above the sea level at high tide. It is also evident that it was not a freestanding structure. A side door in the west wall led into a neighboring chamber, which could have contained a flight of steps leading to the roof (J. Rądkowska, personal communication). The opening in the back (north) wall should be interpreted as a niche(?). A double-wing door in the south wall opened to the inside and could be secured shut with bolts fitted into appropriate holes in the threshold.

The original chamber had a substructure of coral heads forming a U-shape around an empty rectangular space in the center which was aligned with a cubic podium raised against the back wall, directly below the niche [***Fig. 16*** top]. Stone slabs had once covered this foundation substructure. Whatever had once stood in the center is lost, but it may well have been a basin which filled with water through a system of pipes(?) passing through the threshold from the outside (the threshold can be

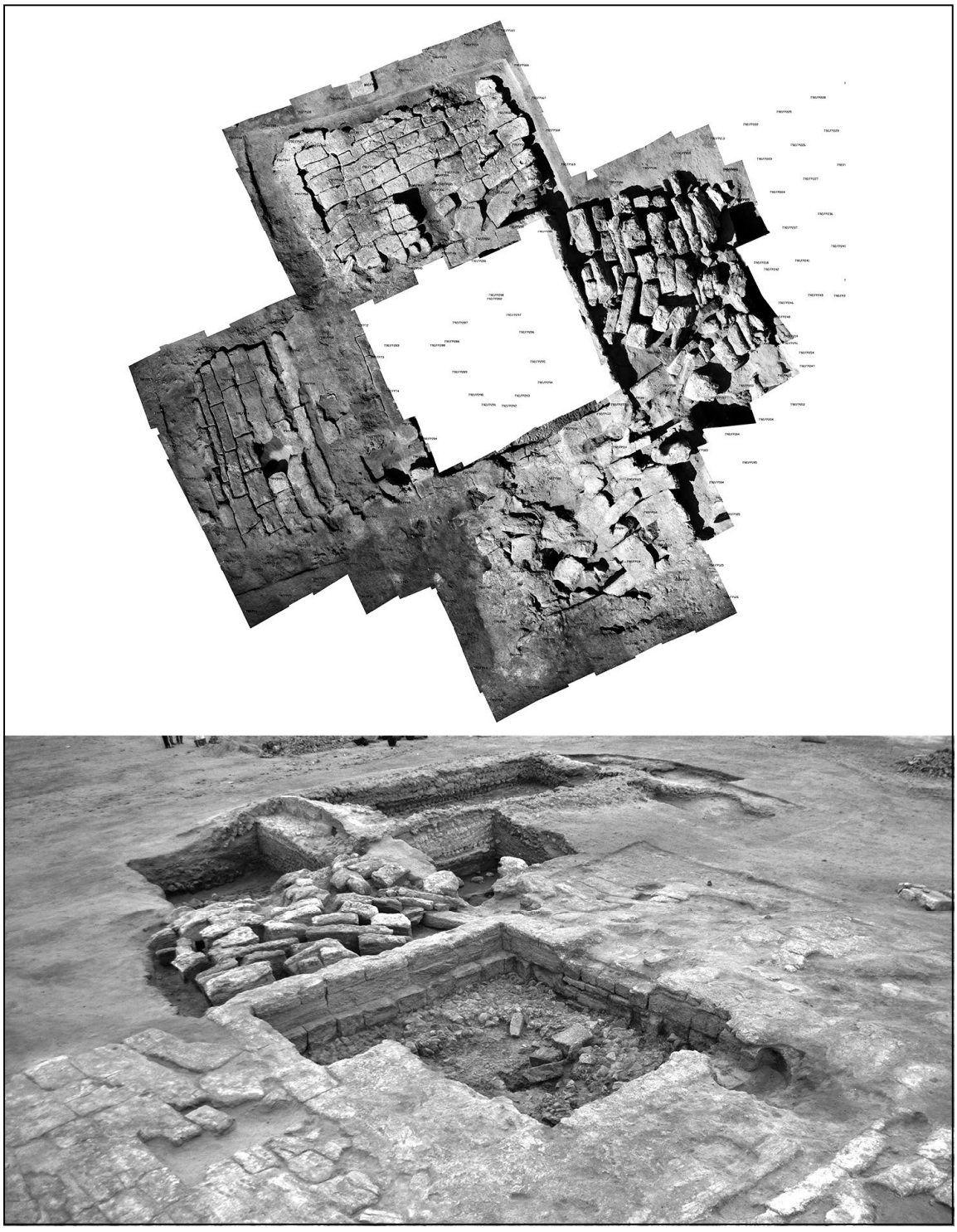

Fig. 15. Trench BE10/11-70: Square Feature looking northeast with the lying stone walls and explored center (PCMA Berenike Project/photo S.E. Sidebotham; orthophoto processing R. Ryndziewicz based on photos K. Braulinska)

Fig. 16. Trench BE10/11-70: Square Feature during excavation, top, original phase with missing floor, looking southwest; bottom, tumbled structures and inscribed altar inside the main chamber, looking north (PCMA Berenike Project/photos S.E. Sidebotham)

seen in the top image in ***Fig. 16***). No pipes have been preserved, but the threshold was raised at some point, possibly changing the original function. The compartment on the left (west) side of the podium was blocked off, the one on the other side may have also been closed off by stone slabs. These were found either lost or disturbed. Filling the inside of the chamber was a tumble of stone blocks, including pieces of a shattered water basin. One of the stones was an inscribed altar bearing an inscription dated to the reign of the Flavian emperor Domitian and evidence of the *damnatio memoriae* that this emperor suffered after death [see ***Fig. 28*** left]. The fill contained material from the 1st through the 3rd century AD, including a 2nd–3rd century lamp with a representation of a Maenad with a thyrsos on the discus and the toe of a more than life-size bronze statue. A white-stone eye inlay may have also belonged to a statue of this kind as well [see ***Fig. 29***]. However, the fill was also mixed with late material, dating from the late 4th to early 6th century AD. This form of mixed deposits have been encountered elsewhere on the site and have yet to be explained satisfactorily (Kucharczyk and Zych forthcoming).

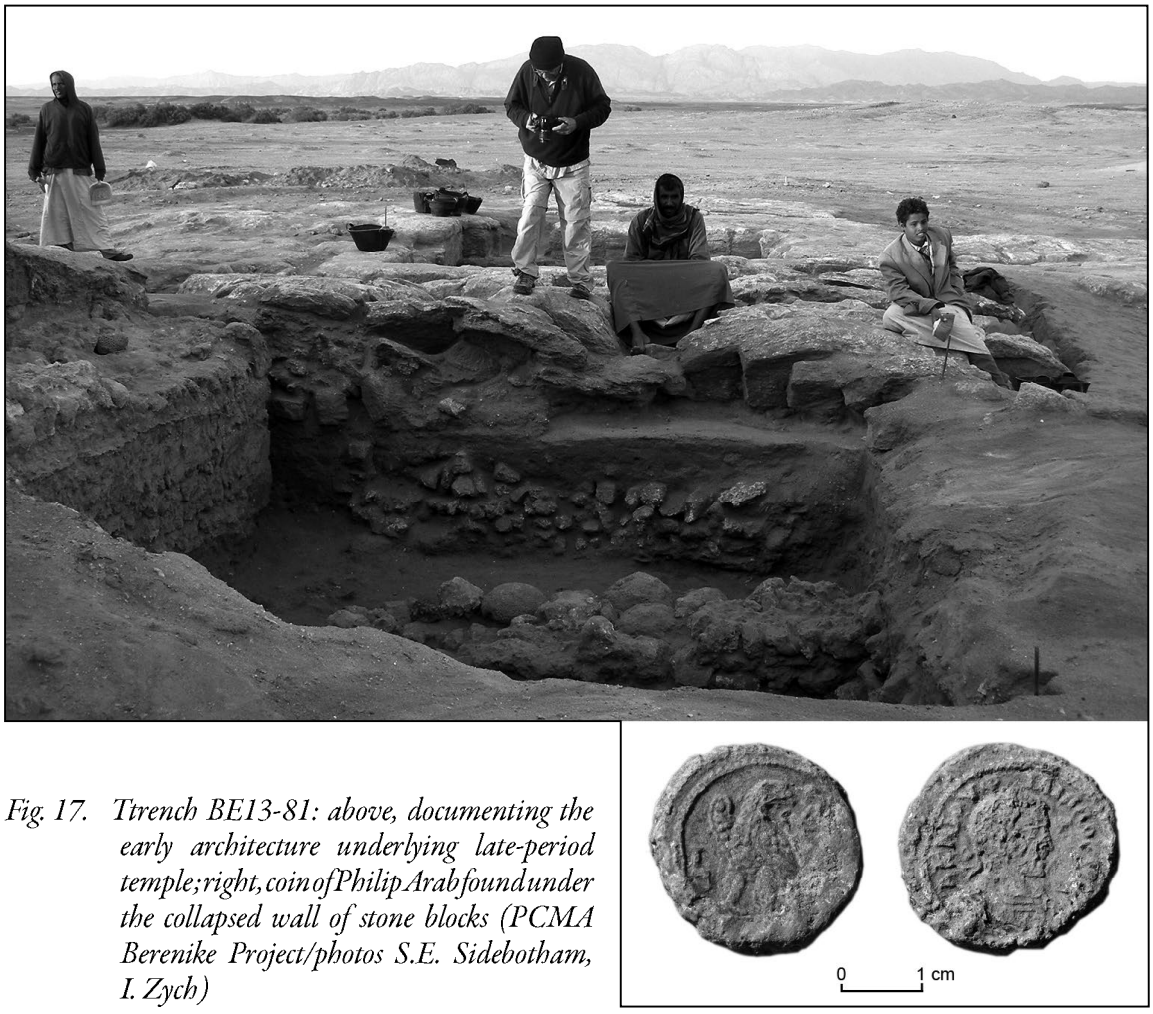

Fig. 17. Ttrench BE13-81: above, documenting the early architecture underlying late-period temple; right, coin of Philip Arab found under the collapsed wall of stone blocks (PCMA Berenike Project/photos S.E. Sidebotham, I. Zych)

The Square Feature was built of blocks of gypsum anhydrite, some of monolithic size, very similar in form and wall bond to the building material found in the Great Temple in the main city. Stone blocks were the preferred building material also in other structures dated to the early Roman period, such as the building with three podia, a tentative temple-mausoleum situated on the western outskirts of the site [BE15-105, ***Fig. 18***] and the northern administrative building [BE15-110, ***Fig. 19***]. However, excavation around the Square Feature (BE12/13-81, BE12/13-87 and BE15-103) has demonstrated an equal preference for broken coral heads to be used in architecture of lesser importance. Fragments of walls built in this technique were discovered in trench BE12/13-81, underlying the collapsed east wall of the Square Feature, very conveniently dated by a coin of Philip Arab (AD 244–249) found on the surface covering the earlier architecture, on which the stone wall had tumbled (see Zych et al. 2014) [***Fig. 17***].

The northern and western quarters around the southwestern embayment constituted the burial grounds of early Roman Berenike. A formal cemetery was discovered in trench BE01-44, on one of the mounds on either side of the road leading to the site. Recent investigations in the ruins of the Hellenistic fort, defensive wall and gate west and northwest of the embayment also uncovered several human burials, although most of these skeletons seem to have been buried without any grave goods, in simple pits excavated quite

Fig. 18. Building with three podia on the western fringes of the site; bottom (trench BE15-105) (PCMA Berenike Project/photo S.E. Sidebotham)

shallowly among the ruins. However, three burials in trench BE15-104—two men and a female—were buried with the requisite care [***Fig. 20***]. The men had rings fitted with small keys of the kind used to lock small caskets, perhaps ones holding trade documents. The older of the two men was buried wrapped in a colored shroud and furnished with two strings of beads, many of which were of semi-precious stones. These individuals were not Roman and neither were they Egyptian; they presumably represented one of the exotic nationalities that passed through the emporium. The female burial was even more outlandish. She was very tall, laid on her back, her head and face covered with a halved amphora. A biconical stone weighing down her pelvis reflects a custom that is again suggestive of a certain exotism. Last but not least, tombs were discovered on a butte west of the site; a survey in the area yielded a gemstone depicting an Eros milking a goat [***Fig. 25*** bottom left].

Of even greater interest is the formal animal cemetery that was discovered in the northern quarter of the site, within the early Roman trash dump that the Project has been excavating on and off since 1994. Cats and dogs were buried there starting from the mid 1st century AD and all through the 2nd century, the later phases characterized by a greater diversity of buried species, for instance, grey grivets, gazelles, wild birds. The dog buried in BE11-76 was exceptional, being wrapped in a mat and covered with the two halves of a cut Dressel 1 amphora [***Fig. 21*** bottom]. However, dog burials have been found also in the western quarter, also in context

Fig. 19. Trench BE15-110: looking west, example of stone-block architecture in the northern complex of the main city mound; note rectangular niche in west wall, once lined with marble and in a wooden frame (PCMA Berenike Project/photo S.E. Sidebotham)

Fig. 20. Human burials: tench BE15-104, formal cemetery from the early Roman period in the ruins of the Hellenistic gate and well installation (PCMA Berenike Project/photo S.E. Sidebotham)

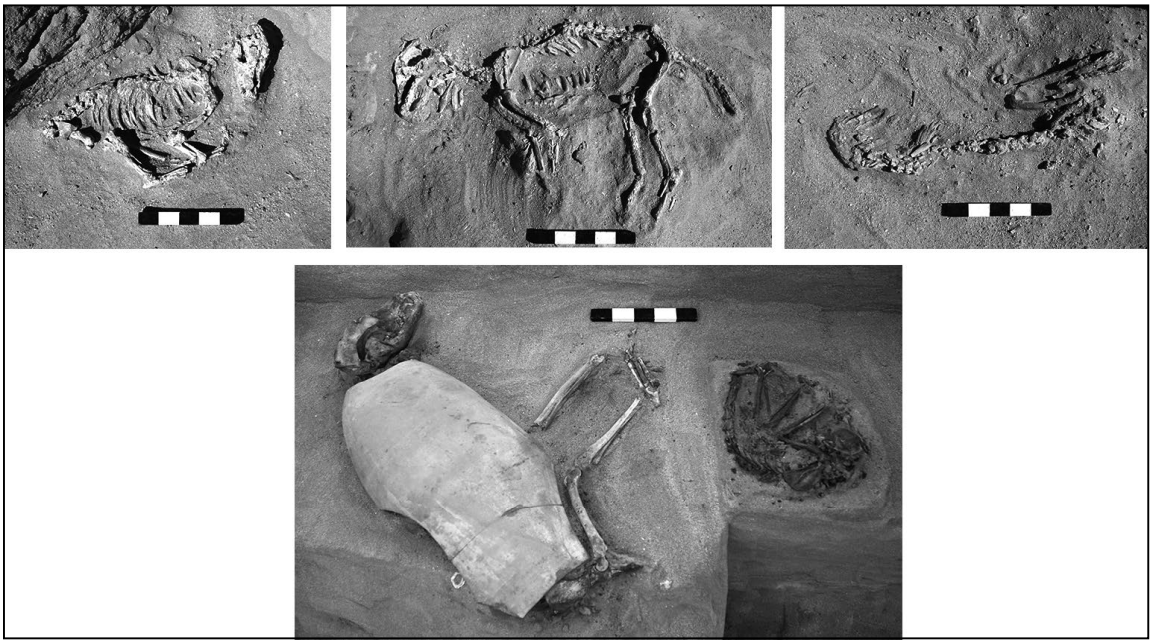

Fig. 21. Animal burials: top, trench BE10-65, three dog skeletons buried intentionally in an early Roman midden; bottom, trench BE11-76: dog burial under an imported Dressel amphora and next to it, a cat burial (PCMA Berenike Project/photos S.E. Sidebotham)

with an early Roman midden [***Fig. 21*** top]. It remains to be seen whether there is more to these burials than just an illustration of a human–pet relation, which should probably be seen as a foreign custom in Berenike (for the finds and a discussion, see Osypińska and Osypiński 2017, in this volume.

In closing, one should comment on the finds from the trenches excavated in the southwestern embayment. Of greatest importance are the wooden parts of ships discovered in the series of compartments. A study of these remains has shown that the ships that sailed the Red Sea in the 1st and 2nd century—at least those that were dismantled and discarded in Berenike—were of Mediterranean design. The area of the stores was also a source of several kilograms of obsidian chunks as well as sizable quantities of pepper, as well as three varieties of frankincense: boswellia, mastic and camphora [***Figs 24, 26***]. Excavations in the trenches along the western side of the lunate-shaped ridge yielded a set of finds exemplifying a taste for a luxurious life—fine pottery wares, fine glasses (see Kucharczyk 2017, in this volume), gemstones [***Fig. 25***] and terracotta oil lamps. One lamp, which must have come from Italy, perhaps in the baggage of a Roman intermediary, also shows an inclination to have a good time: the fragmentary discus scene showed an erotic scene. Equally fine pottery, glass and lamps came from the structure around the cedar-wood post in the northernmost part of trench BE09-54, e.g., a large volute lamp with a wreath represented on the discus.

Much more representative of the early Roman period in Berenike is the assemblage coming from the trash dumps in the northern quarter of the site. The trenches excavated in this area yielded a plethora of artifacts, including pottery: fine wares, cooking pots, storage and transport containers, illustrating the extent and directions of the trade that passed through the emporium in the 1st and 2nd centuries AD. The following is a characteristic of the pottery assemblage from two of the trash trenches, BE14-96 and BE15-107, which in the opinion of Agnieszka Dzwonek, one of the Project's pottery specialists, was the most representative of various kinds of vessels used in the port. Most of the assemblage consists of Egyptian amphorae and locally produced table and cooking ware, with a substantial representation of imported wares from different parts of the Roman Empire and, specifically for this site, from lands beyond the imperial borders.

According to Dzwonek, who is the author of the remarks below, most of the ceramic material from trench BE14-96 was made up of Egyptian amphorae made of Nile silt (around 60–65%). Two types were the most common: Egyptienne 3 (a broad long form with almond-shaped or triangular rim and two small looped handles, produced in three different clays: calcareous light orange-brown, dark brown and dark reddish-brown with grey core) and Dressel 2–4 Egyptian (copying Koan Hellenistic amphorae with double handles) produced in the Mareotis region from the mid 1st century AD.

The most common imported amphorae were: a) Dressel 2–4 Italian, produced in the Campania region, distinguished by its characteristic volcanic fabric; dated from the late 1st century BC to the early 3rd century AD; and b) Dressel 2–4 Cilician, produced in both western and eastern Cilicia, from the early 1st into the 2nd century AD; a relatively coarse fabric, light

beige to greyish-orange with many well-sorted inclusions; vessels were painted occasionally with red bands on the neck and shoulders.

Other kinds of amphorae were sporadic: Dressel 20 Baetica, Dressel 24 Asia Minor, Dressel 6A Italy–Adriatic Coast, Dressel 43 Crete and unidentified types of Aegean amphorae.

There was also an abundance of table and cooking wares produced locally in silt, marl or silt/marl mixed clay. The most popular forms were bowls, especially small thin-walled bowls with slightly inturned rim (Mons Claudianus type 15), dishes, small carinated cups, jugs with plain or three-foil rim, small cylindrical vessels, marl spouted vessels, jars and basins, lids, cooking pots (especially Mons Claudianus type 40–41) and casseroles.

Fine wares were represented only by a few small, often very abraded sherds, making the dating of the contexts much more difficult. These were mainly vessels made of fine pink Aswan fabric (not many diagnostics), also sometimes with pale reddish coating. Sigillatas are much less represented: Eastern Sigillata A (forms 13, 29, 35–37, 45), Eastern Sigillata B (forms 29, 32, 70), Italian Sigillata (forms 21, 26–27, 34). A few fragments of thin-walled vessels with barbotine decoration were also registered.

A substantial amount of vessels imported from lands outside the Roman Empire is significant and typical of the Berenike assemblage. Storage jars from South Arabia predominate in this group. These large coarse containers occur in three different organic fabrics: marl, buff and oxidized. The second big group of non-Roman imports is constituted by pottery from India. These pots are generally distinguished by a specific red pellet fabric, black or reddish-black in color, with burnished surfaces. These are mainly cooking wares (like forms Wheeler 6, 8 or 24–25) and coarse wares. Finally, one should mention handmade pottery, of which only a few tiny pieces were found. This pottery was produced locally in the Eastern Desert, but identification and analysis are still hindered by the absence of extended studies.

The other trench in question, BE15-107, located a dozen or so meters from trench BE14-96 right in the center of the animal cemetery, produced a lesser pottery assemblage. In structure, however, the collection consisted mostly of the same kind of ceramic material, that is, amphorae produced locally: Egyptian Amphora 3 (mainly in dark brown fabric) and Amphora Dressel 2–4 produced in the Lake Mareotis region. Among the imported vessels, the most common was also Amphora Dressel 2–4, but produced in Campania foremost and much less abundantly in Cilicia and the Tyrreanean and Aegean regions. Single fragments of other types of amphorae were present as well, e.g., Forlimpopoli (Italy), Late Rhodian Amphorae or unidentified types of Spanish clay.

The other kind of container, which appeared regularly almost in every context, is the keg, a big rounded vessel with a side spout, produced of Nile silt. Table and cooking wares in this trench did not come in any significant number. Bowls (Mons Claudianus types 15 and 8) were recorded, along with jugs, marl strainers (MC type 66), cylindrical vessels, coarse storage jars, cooking pots (MC types 31, 40), casseroles (MC types 62, 105), lids and one unguentarium.

As for fine wares, the record holds 1–2% of this category of ceramics. Most

were thin-walled vessels made of Aswan pink clay. Single fragments of Sigillata (ESA and ESB) were found, as was also an exceptional little glazed bowl (in pieces) produced in Tarsus. Likewise, the quantity of non-Roman pottery was much smaller compared to the other trench. Thick sherds of organic storage jars from South Arabia were present, along with Indian coarse and rice-tempered vessels, Indian cooking pots and even a single sherd identified as coming from Axum.

Excavation in trench BE14-100 provided evidence of a process that seems to have been fairly common in the early Roman period, namely, salvage of building stone. The stone blocks from the structure in the western part of the embayment were removed [***Fig. 22***]. Blocks were removed from the Hellenistic fort in the western quarter (trenches BE12-83/85/86) and the already derelict defensive wall (BE13-90/93), in some trenches (like BE01-42), blocks had been prepared but abandoned before they could be moved. Even without calculating the volume of the stone that was thus moved from its location (regardless of where it was quarried originally, see Harrell 2017: 245–247), it takes some imagination to see all this stone being used elsewhere on the site. It must reflect major building investment on a scale that can only be described as "Imperial" — projects of construction like the Great Temple in the main city, the Shrine of the Palmyrenians. It should be noted that as far as domestic architecture is concerned, the Project has excavated mostly late structures built in the characteristic coral-head technique and some modest sand-brick walls of Ptolemaic date under the Roman trash dumps in the northern quarter; the early Roman architecture of the town is practically unknown and has only started to be explored. Even so, recent excavations in trench BE15-110 [see ***Fig. 19***] have shown that the major buildings of the early town were constructed of large stone blocks. We may be dealing thus with a situation, in which the building material from the Hellenistic ruins was

Fig. 22 Trench BE14-100: looking northwest, robber trench documented in the negative by salt cementing of the fill after the stone blocks of the wall were removed (PCMA Berenike Project/ photo I. Zych)

Fig. 23. Patch of broken basalt chunks - ship ballast in the upper parts of the embaymenr (PCMA Berenike Project/photo S.E. Sidebotham)

salvaged and reused in constructing the Imperial city of the Julio-Claudian, Flavian and Antonine age. Indeed, the quest for stone building material in this era must have been overwhelming: another building that was apparently dismantled down to the ground is the so-called building with three podia [see ***Fig. 18***]. The structure is generally of Augustan date. Considering the range of the dating evidence for dismantled buildings, the building industry in Berenike in the 1st and 2nd century AD must have been thriving.

The latest activity in the southwestern embayment is represented by a series of circular patches made of broken basalt [***Fig. 23***]. The basalt, identified as coming most likely from Sanaa (Sidebotham 2008: 313 and note 30; Harrell 2017: 240–245), was probably ship ballast, carried presumably in canvas bags (the circular shape would suggest some kind of container of this kind) and jettisoned here when the ships loaded up with whatever goods they were commissioned to transport. The remains cannot be dated, however, the sole suggestion being that the action postdated the functioning of the southwestern embayment, possibly in the 3rd century AD or later.

DISCUSSION

"It would have been logical to place the harbor facility and workshops making items used in ship repair/refurbishment in close proximity to each other" (Sidebotham 2008: 313). This was the view held by the excavators prior to the start of the American–Polish project in 2008. The topography of the southwestern embayment, especially when viewed in Google Earth imagery, nicely mimicked a regular built port. At the present stage of the project, after several seasons of exploration and study, and pending a more extensive publication, it may be said that the preliminary evidence is sufficient to form an idea of when the southern harbor of Berenike was in use and what it may have looked like.

The documentary and artifactual evidence from excavations of the early Roman trash dump in the northern part of the city has also provided a trove of information on the goods that passed through the port, whether as trade commodities or crew rations or ship supplies, and the Roman customs house and shipping procedures from the early centuries of the Empire in Egypt. There is even a papyrus from Berenike listing items related to sailing: bundles of rope, a mast belt, block and tackle equipment, branding irons and a type of gum (Bagnall, Helms, and Verhoogt 2005: 45–47 No. 131; for the documentary evidence, see Bagnall, Helms, and Verhoogt 2000: 21–24; 2005; for a summing up of the Red Sea trade, especially Sidebotham 1986; Seland 2016; Sidebotham 2008; De Romanis and Tchernia 1997). It is a pity though that apart from the name of one ship, the *Gymnasiarchis* (Bagnall, Helms, and Verhoogt 2000: 61 No. 86), and the pictorial graffito of a ship with sails furled on a potsherd (Sidebotham 2008: 309–310, Figs 7–8), the epigraphic and pictorial sources have not yielded anything specifically related to the port(s) in Berenike.

Previous fieldwork, notably a magnetic mapping of the northern part of the site, had given an idea of a northern inlet, which could have been used for smaller craft (see

Fig. 24. Exampels of minerals discovered in Berenike: left, obsidian, and right, agate nodule (PCMA Berenike Project/photos I. Zych, E. Nieto Breogan)

Fig. 25. Cameo blanks and carved cameos from Berenike (PCMA Berenike Project/photos S.E. Sidebotham, K. Braulińska)

Herbich 2007). It was also clear from the excavation that a sea wall built sometime in the 1st century AD ran along at least parts of the eastern extent of the site, meaning that boats, if not regular ships, could have been moored there; this gives a limited idea of the configuration of maritime facilities in Berenike in the Imperial period (see Sidebotham 1996: 25; 2000: 74–75). A paired set of potential lighthouse and an edifice (a small temple or large altar, for example) was also part of the early Roman harbor landscape (Sidebotham 2008: 317–318 with references; most recently Kotarba-Morley 2017d: 216–217).

Combining the evidence of the recent excavations in the southwestern embayment and the geomorphological survey has revealed how misleading the satellite image is. Strabo it seems had it right when he reported (17.1.45) that Berenike was a convenient landing place, an anchorage or roadstead, and not a proper manmade harbor of the kind that the Roman Mediterranean harbors of Caesarea Maritima, Alexandria, or even Carthage or Ostia near Rome, to name just a few of the well-known ports that have been reconstructed based on the archaeological record. Writing less than a century later, Pliny the Elder (*Nat.* 6.26.103) glossed over the issue. The archaeological record remains mute and the geophysical prospection, which has covered all the significant parts of the site, does not leave any real hope for the discovery of anything like the Roman pier at Myos Hormos/Quseir al-Qadim, which dates from the early 1st century AD (e.g., Blue 2002). The finds from Myos Hormos are an indication that the technology and know-how were there, the architecture of the monumental Great Temple in Berenike (as well as some other early Roman buildings) demonstrate a capability for major building undertakings, and the volume of the Red Sea trade—as reasonably reconstructed based on historical and epigraphical evidence, demonstrating the importance of this trade for the early Roman Empire—suggests that there were both economic and political reasons for the investment. Moreover, considering the degree of military security and management (network of *praesidia* and working lines of communication) in the Eastern Desert hinterland throughout the early Roman period, one cannot see any significant obstacle in the form of, for instance, brigandry that could have restrained such

Fig. 26. Three different kinds of franckincense found in the harbor: from left, boswellia, mastic and camphora (PCMA Berenike Project/photos K. Braulińska)

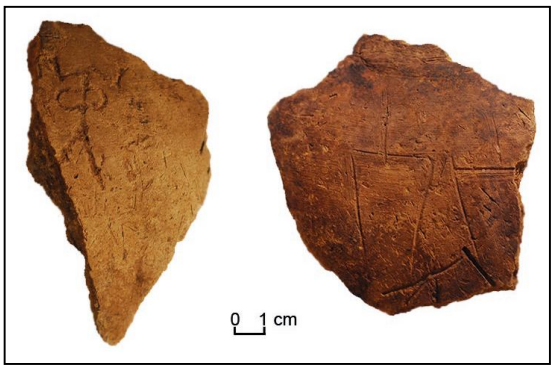

Fig. 27. Sherds with graffiti interpreted as Hadramauti (PCMA Berenike Project/photos S.E. Sidebotham)

a project. One is led to conclude that the reasons for there not being a proper man-made harbor in Berenike was that it was simply not needed there in such form. This is meaningful only in the sense that it did not compromise the functionality of Berenike as a commercial entrepôt, that is, a transshipment port where merchandise may be imported, stored or traded, and in most cases sent on. It also assumes that all the required functions related to ship maintenance and provisioning, as well as the transfer of goods to and from ships was handled without hitch.

Berenike was undoubtedly a hub of the Roman Red Sea trade, but it was by no means "created" by the Romans. It was a functioning center that was stitched into the Roman trade system, tapping into the extensive and prospering Indian Ocean trade network of the late 1st century BC (Tomber 2008; Fitzpatrick 2011: especially 29–30 and notes 10 and 11). Its role grew as the Roman trade with the East accelerated, an economic process that led Pliny to lament on the professed trade deficit incurred by Rome (Fitzpatrick 2011: 31). However, while silk and gemstones can be considered as *luxuria*, other commodities, admittedly expensive, like spices and frankincense, were already fairly mundane. Their acquisition in a controlled way, bringing a sizable return to the Roman financiers who could loan the requisite capital for organizing the shipping, determined the extent of the investment in infrastructure that took place in Berenike. As Fitzpatrick points out, voyages to India were hugely expensive and could not be organized without the participation of financial intermediaries, such as the Sulpicii of Puteoli, who acted as a bank underwriting the risk of loans to Roman traders (Fitzpatrick 2011: 40–41). Roman efforts to control the major trade networks of the East culminated under Trajan and Hadrian, and, again citing Fitzpatrick (2011: 43 with reference to Fergus Millar's research, see note 73), "the largest amount of East–West exchange flowed not via the difficult and often dangerous trans-Eurasian overland route, but rather via the comparatively fast and safe oceanic trade route". While this concerns the Arabian Gulf route to Mesopotamia, it also reflects the route taken by Chinese and Far Eastern goods, which were sailed down India's rivers to the Indian entrepôts servicing Arab and Roman trading vessels (Fitzpatrick 2011: 44). Fitzpatrick also sums up the evidence for Indian traders in Egypt (2011: 48 and notes 101 and 102) and states, citing among others the archaeological evidence from Berenike (Sidebotham, Hense, and Nouwens 2008: 189–192), that the Roman Indian trade in the 1st century AD was handled by a "cosmopolitan assortment of polyglot intermediaries from the southeast of the Roman Empire who used Greek as a common *lingua franca*" (Fitzpatrick 2011: 49).

Wealth to be acquired by tapping into this lucrative trade (including the much underestimated role of the Arabian peninsula and the incense market supplying the demand of Roman religious observance in this period, see again Fitzpatrick 2011: 51) was of such unimaginable proportions that it fired Roman imperial policy from the time of Augustus well into the 2nd century AD. Berenike, or rather the Red Sea coast of Egypt in general, thus became a player in Roman dreams of Eastern expansion (see Sidebotham 1986: 139ff.), the first step to which, in Augustus's view, was to control not only the African, but also the Arabian shore of this, as

Fitzpatrick puts it so figuratively, "Red Sea commercial bottleneck". On the other side of the Indian Ocean, however, there were the complicated politics of India in this period, especially the rise of the Kushan Empire and its reaching out toward Rome (Fitzpatrick 2011: 44 and note 78, citing J. Thorley). Roman sources mention at least two instances of diplomatic envoys being sent to the Roman Emperor: by the first Kushan king Kanishka the Great (the king's missionary zeal in spreading Buddhism should also be taken into account) to Augustus and later again in the times of Hadrian. The possibility that these envoys would have traveled by the sea route and through Berenike can only be suggested and not proven, but, as mentioned above, there is enough sound archaeological evidence from the harbor to support the idea of Indians perhaps even residing in Berenike (see Tomber 2000). In turn, the South Arabian presence in Berenike is manifested especially in pottery, sherds bearing graffiti of the Hadramauti kings (Sidebotham and Zych 2011: 176) [***Fig. 27***] and some of the bronze statuary and stone altars reused in the late Harbor Temple (Radkowska and Zych forthcoming a; b). The graffiti are proof of trading, the religious articles of cultural infuence and possibly even residence.

The documentary evidence from Berenike gives insight into two other categories of the population in Berenike in the first centuries AD: soldiers and cameldrivers (for extensive discussion, see Bagnall, Helms, and Verhoogt 2000; 2005; Ast and Bagnall 2016). These men drew water rations in Berenike and would have presumably made use of at least provisional housing as well as using other amenities, including food preparation (the water in two instances was intended for a garden and for a brber shop). To judge by a few of the surviving papyri, like the verses related to the goddess Kybele (e.g., Ast and Lougovaya 2015; Ast and Bagnall 2016: No. 262), some of these people had a taste for the better life in terms of literary interests, hence would have presumably opted for a comfortable style of living. This the town of Berenike should have been able to provide.

The archaeological evidence from the Polish–American excavation of trenches within the southwestern embayment paints a picture of what Berenike's harbor would have looked like in these early centuries. The ridge surrounding the embayment is still the most convenient walkway from the area of the city around the Great Temple, which must have been a landmark from both the sea and land sides, to the southwestern part of the site. The ridge appears to have at its core a natural fossil reef, encased in a kind of substructure, which, if continuous, would have formed an enclosure around the bay. A dip in its northwestern part (used today by the expedition's jeep) may have been the official gateway in and out of the embayment. The bay served as a natural landing place for the small tender that plied the waters of the lagoon between the ships standing out at the roadstead and the natural landing places on the beach. Assuming any kind of customs process taking place at Berenike, even if the actual taxes and the imported goods were paid at Koptos in the Nile Valley, as the Tariff of Koptos would suggest, the embayment would have been a secure and convenient place for unloading and checking before goods were moved to safe storage and subsequently packed on a caravan of camels or donkeys. No

warehouses have been discovered so far in this area, although the existence of buildings resembling warehouses was recorded in the southeastern part of the wall, near the presumed seawall.

The results of excavations within the embayment area have revealed the presence of a large building, constructed of dressed stone blocks, with courtyard and evidence of ovens and fires. Finds included an iron arrowhead as well as a gamut of early Roman storage containers. The building was dismantled down to the foundations (although it should be emphasized that little in the way of sturdy foundations was needed in Berenike), at least in the two trenches in which it was traced. The rubble found in a nearby trench (BE09-55) could have come from this structure, although one is left wondering why it would have been carried away to be dumped in such meticulous fashion from a ruin. In any case, this trench and the neighboring BE14/15-102 trench yielded artifacts like exquisite carved gemstones, a pair of loaded dice and a almond-embossed glass beaker, attesting to the "luxurious" furnishings of this structure if nothing else.

The finds from the opposite end of the embayment, where it meets up with the houses of the town, also suggested a more affluent lifestyle, not the least the fairly unusual terrace of resin-hardened tamarisk twigs and pebbles, connected with a cedar post and wooden framework around a space laid with successive layers of matting. The space was not identified functionally at the time of excavation, but considering the evidence: two halves of a pearl-oyster shell and a camel rib shell in a pit by the cedar post, two large chunks of Syrian fir tree resin also in an apparent pit and a plaque of Boswellia wood, as well as a faunal assemblage indicative of food remains (including a rodent) (Sidebotham and Zych 2011: 37–38 and Fig. 4-17), we may be dealing here with a small shrine.

The remaining architecture that has been explored within the embayment, which is tentatively also the reason for the rising embankments that stretch from the ridge down into the bay, was of a different nature. It consisted of low walls of broken coral heads, just two or three courses high, anchoring partition walls of nothing more than palm-leaf or tamarisk-branch mats and thatched with similar mats. These walls formed at least eight small units aligned side by side along a ridge descending into the bay. They would have been arranged around open spaces where industrial and domestic activities took place. This is especially evident in the line of excavations in the eastern (but actually central) part of the embayment, where large pieces of planking from ships and coils of thick mooring rope were discovered, partly destroyed by a huge fire that seems to have burned in a single spot, raging so fiercely that it left a very fine black ash deposit more than a meter thick at its center, spreading out for the better part of 20 m. In the southern end of this section there were more baskets and acacia wood, suggesting a more domestic character of this area.

The eastern end of the embayment, which escapes notice owing to the central ridge with the architecture and remains described above, has not been explored to any extent. However, the magnetic map of the area suggests that it also formed a natural cove with the city architecture coming down densely to the shore, practically to the water edge. Buildings here were fairly large, separated by narrow winding alleyways, including one compound with a large

hall ending in broad apses at either end of the transverse axis. North of this area stands the so-called West Shrine or Temple of the Palmyrenians, which the Dutch–American project excavated in the mid 1990s, which must have been an important landmark in the late 2nd and early 3rd century AD. This western quarter of the city (which so far has not yielded any finds earlier than the 4th to 6th centuries AD) shows a definitely different orientation than the houses on the city mound east of the Great Temple. A study of the magnetic map of the site shows the different orientation of the urban architecture on the main mound and the quarter of buildings behind the Great Temple, which appears to act as a hub for the two quarters. The temple seems to be fitted into the grid of the western district despite having its back to it. Its position in the city is aligned more or less with the path passing along the lunate-shaped embayment ridge and crossing the main mound in a fairly straight line all the way to the sea in the outer bay. This is actually the *decumanus* of the Roman town, the main street that also featured a tetrapylon-like structure at the crossing with the main *cardo*. Moreover, one should note that the apparently early Roman temenos in the northeastern part of the main mound seems to follow the orientation of the western district, as if the more strictly regular architecture from the center of the town did not exist.

Objectively speaking, the Great Temple is the central point of the town and it is the oldest standing building excavated to date on the site. In its currently known form, it falls in well with the late Ptolemaic/early Roman Egyptian temple-building tradition exemplified by the score of sacral buildings that were constructed in this period in the Nile Valley in Upper Egypt (e.g., Elephantine). The orientation of the town architecture around it must have respected it to some extent regardless of how isolated it was from the urban fabric as a whole. The main east–west thoroughfare started from in front of its facade and the western of two *cardines* heading off to the north and south of this *decumanus*, ran in front of it. The streets in the town proper, located on the promontory to the east and northeast of the Great Temple, followed a more or less regular grid despite never being apparently given pavements or porticoes. Three round dots at the intersection of two main streets, observed on the magnetic map of the site, might even suggest the presence of a tetrapylon. Taken together with a broad range of archaeological and architectural evidence suggesting the prosperity of the town in the early Roman period, one can easily imagine a major urban refurbishment, if not building from scratch, aided by an Imperial endowment perhaps, in this part of the town at the heyday of the Roman imperial trade, that is in the late 1st through mid 2nd century AD. Inscriptions on stone, on altars as well as from the walls of the Great Temple, suggest heightened activity in the time of Claudius, the Flavians, Trajan and Hadrian (Ast and Bagnall 2015; 2016: 12–15; 2017).

Last but not least, those approaching the natural landing place within the embayment would have observed immediately a semi-insular sanctuary composed of a tower-like structure at least 6 m high, or rather a group of structures including this shrine. It may have been dedicated to the cult of Isis-Tyche and the Roman emperors. The evidence is circumstantial, but if it is accepted, then the shrine certainly existed in the reign of Domitian (reigned

AD 81–96; an inscribed altar mentioning this emperor was found inside the so-called Square Feature in this sanctuary) and was still in place in the first year of Trajan's reign (AD 98), when another small altar was inscribed with a dedication to Isis-Tyche by a freedman from the emperor's court (see Ast and Bagnall 2017) [see ***Fig. 28***]. A coin of Philip Arab (about 240) indcates when this temple was already in ruins.

Interestingly, the sanctuary was the only part of the southwestern bay to continue in use in the later Roman period, that is, in the late 4th through mid 6th centuries AD, after which Berenike appears to have been peaceably deserted. A new temple was built on hallowed ground, partly reusing for structural purposes one of the old standing walls. For all practical purposes, however, it was located on the far western outskirts of the port, which must have had much of the desolate wasteland look that it has today. In this context, keeping in mind that the piles of unworked vesicular basalt were recorded mostly along the top of the ridge, and hence clearly post-date at least the 3rd century AD, they likely represent shipping events from the late period of Berenike.

To sum up, there seems to be abundant evidence at this point of major building works taking place in the city, the Great

Fig. 28. Inscribed stone altars from the harbor sanctuary: left, dedication dated to the reign of Domitian, and right, from the reign of Trajan (PCMA Berenike Project/photos S.E. Sidebotham)

Temple and the Square Feature in the semi-insular sanctuary in the port being only two examples. The archaeological record has shown large squared blocks of stone being salvaged from the Hellenistic ruins for use presumably elsewhere at the site. Some are still in place, prepared for moving but abandoned. It seems clear, however, that these works did not include building a "proper harbor" and that the southwestern embayment was used in lieu of such a harbor.

The archaeological evidence from the area of the harbor bay paints a picture of everyday activities involving ship maintenance and repairs, mundane everyday jobs, perhaps burning lime, copper-working and less easily identifiable activities. A group of *Pinctada* shells laid flat on the ground suggested cooking and consumption activities, perhaps in open-air taverns. Yet the tamarisk/cobble resin floor as well as the platform-like substructure at the other end of the ridge represent Roman(?) engineering at its best, connected with a building of substantial size and possibly also splendor. Considered in context with the Roman sanctuary at the entrance to the bay and in light of the evident disuse of the landing place after the 2nd century AD, one is entitled to wonder whether this area was not used also for the special occasions when a large cortege, for instance accompanying a foreign ambassador from far-off India, would set down, resting after the sea journey before the next leg of its trip by caravan across the Eastern Desert.

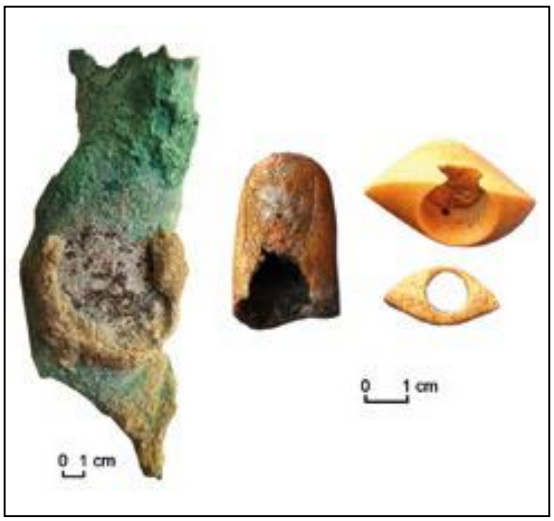

Fig. 29. Parts of bronze statuary from the harbor sanctuary: from left, fragment of the leg of a nude male figure; larger than life toe and stone eye inlays (the bottom one resembles cat mummy inlays from the Nile Valley) (PCMA Berenike Project/ photos S.E. Sidebotham)

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