Berenike: Archaeological fieldwork at a Ptolemaic-Roman port on the Red Sea coast of Egypt 2008-2010

Steven E. Sidebotham[*]
Iwona Zych[**]

Riassunto

Le ricerche sul campo hanno permesso di ampliare le conoscenze sui contatti di Berenice con altre zone del Mar Rosso e dell'Oceano Indiano, specie riguardo a pratiche religiose, manifattura, navigazione, consumi, sistemi di costruzione navale dell'antica Roma. Una mappatura del sito ha localizzato precisamente tutte le sezioni di scavo dal 1994. Da un'indagine geofisica si sono ricavati nuovi dati sulle caratteristiche del sottosuolo. Gli scavi nell'area di un fosso a V dell'era tolemaica, individuato nel 2001, non hanno fornito altri dettagli sulla sua funzione. Il ritrovamento di quattro scheletri di cani ha suggerito un cimitero di animali da compagnia. Circa 240 *ostraca* del I secolo d.C. conservano informazioni sulla fornitura militare di acqua dolce a Berenice. Si sono ritrovate iscrizioni preislamiche sudarabiche e una dodicesima lingua antica è ora documentata sul sito. Del legno importato di *Boswellia* ha testimoniato la presenza di incenso. Entro il I e II secolo d.C. il porto insabbiato è diventato deposito di detriti e area industriale. Cordami, una bitta e legno navale segnalano un'attività cantieristica navale continuativa. Dati geofisici e di scavo hanno indicato la presenza di un altare su un'isola o sul cumulo di una draga. Il tempio conteneva una dedica a Iside, Tyche e forse Serapis, dei bacini in miniatura, altari, un bruciatore d'incenso, una patera/phiale con resti di un tripode, ciotole in legno e cauri. Gusci d'uovo di struzzo servivano a sortilegi magico-religiosi. Pentagrammi dipinti e incisi erano probabili simboli della stella Sirio, associata al Nuovo Anno egizio, inizio della piena annuale del Nilo, e alla dea Iside. Nei depositi di rifiuti, testimonianze di un'attività di produzione con legno, gusci di tartaruga, ossa di animali e cuoio nel tardo periodo romano.

Summary

Fieldwork expanded knowledge about Berenike's contacts with other areas of the Red Sea-Indian Ocean including religious, industrial, consumer and maritime practices and early Roman-era ship building methods. A total station survey precisely located all trenches excavated since 1994. Geophysical surveying provided new data on subterranean features. Excavations near a Ptolemaic-era V-shaped ditch first documented in 2001 provided no additional details about its function. Excavation of four dog skeletons suggested a pet cemetery. Approximately 240 1st century AD ostraca preserved details about Roman military supply of fresh water to Berenike. Excavations recovered Pre-Islamic South Arabian graffiti, which added a twelfth ancient language documented from the site. Imported Boswellia *wood indicated the presence of frankincense. By the 1st-2nd centuries AD the harbor had been engulfed in sand and became trash dumps and industrial areas. Ropes, a bollard and ship timbers signaled some continued maritime activity here. Geophysical data and excavation suggested that a late Roman-era shrine had been constructed on an island or dredge heap. The temple contained a dedication to Isis, Tyche and perhaps Serapis, miniature temple pools, altars, an incense burner, a patera/phiale with remains of a tripod, wooden bowls and cowry shells. Ostrich eggshells preserved magic/religious incantations. Painted and incised pentagrams were likely symbols of the Dog Star, associated with the Egyptian New Year, the start of the Inundation season and with Isis. Trash dumps provided evidence of small scale industrial activity in wood, turtle shell, animal bone and leather in the late Roman period.*

Résumé

Des recherches de terrain ont complété nos connaissances sur les contacts de Bérénice avec la mer Rouge et l'Océan Indien, y compris sur les pratiques religieuses, industrielles, commerciales et maritimes et sur la construction navale à l'époque romaine. Toutes les tranchées fouillées depuis 1994 ont été localisées très précisément au tachéomètre. Une reconnaissance géophysique a livré de nouvelles données sur les structures souterraines. Cinq squelettes de chien suggèrent l'existence d'un cimetière d'animaux de compagnie. Environ 240 ostraca du 1er siècle AD livrent des détails sur l'alimentation de Bérénice en eau potable par les militaires romains. Les fouilles ont mis au jour des graffiti sud-arabes pré-islamiques attestant la douzième langue connue sur le site. L'importation de bois de *Boswellia* indique la présence d'encens. Aux 1er et 2e siècles AD, le port fut englouti par les sables et devint une décharge et une zone industrielle, mais des cordages, un bollard et des éléments de charpente navale attestent la continuité d'une activité maritime. Les données géophysiques et les fouilles suggèrent qu'un temple fut construit sur une île ou un tas de dragage à la fin de l'époque romaine. Il contenait une dédicace à Isis, Tyché et peut-être Sérapis, ainsi que des bassins miniatures, des autels et un brûle-parfum, une phiale/patère avec un reste de tripode, des bols en bois et des cauris. Des coquilles d'œufs d'autruche ont conservé des incantations religieuses ou magiques. Des pentacles peints et incisés symbolisaient probablement Sirius, associée à Isis et à la nouvelle année égyptienne marquant le début de l'inondation. À la fin de la période romaine, les dépotoirs dénotent une petite industrie sur bois, carapaces de tortue, os et cuir.

Introduction

The University of Delaware (USA) and the University of Warsaw Polish Center of Mediterranean Archaeology continued fieldwork at Berenike on Egypt's Red Sea coast (Fig. 1) in 2008 with a short season of geophysical surveying, which continued in 2009 (Sidebotham & Zych, 2008) and 2010.[1] A brief two week excavation season took place in winter 2009

* *History Dept, University of Delaware*
236 Munroe Hall
Newark, DE 19716-2547 (USA)

** *University of Warsaw*
Polish Center of Mediterranean Archaeology
4, Nowy Świat St
PL-00-497 Warszawa (Poland)

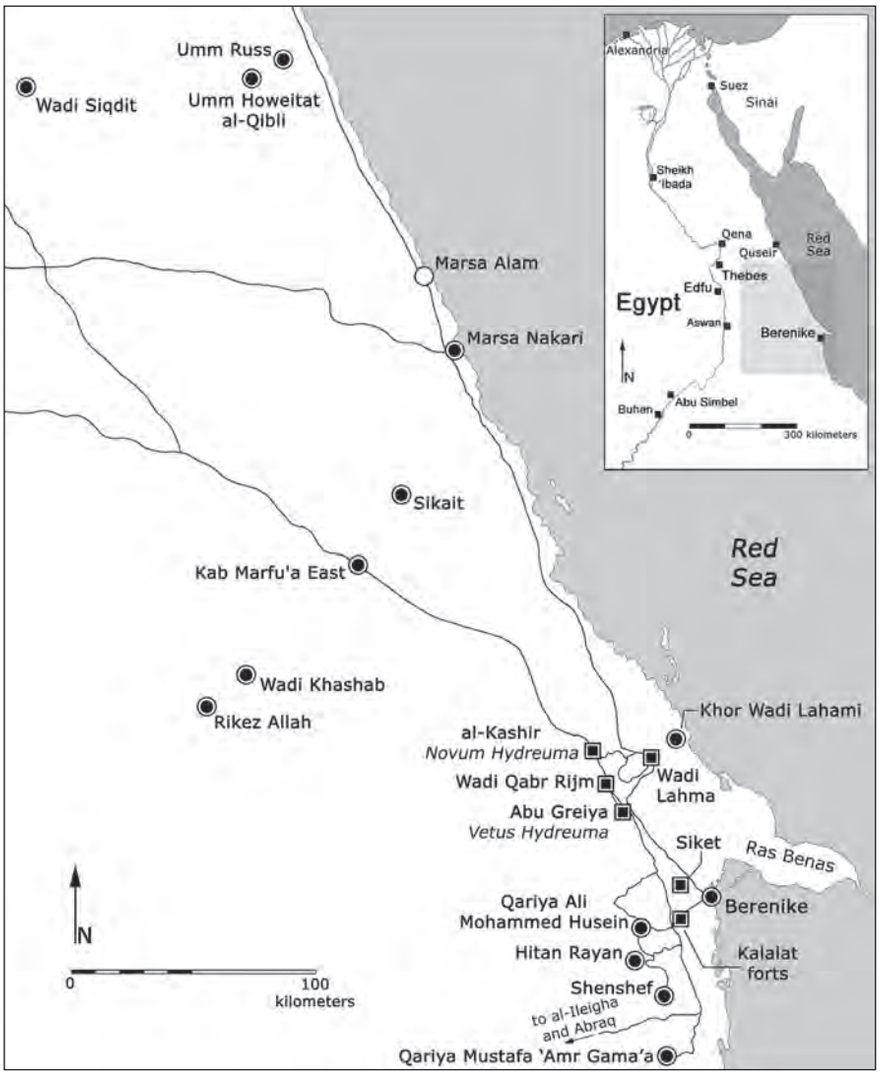


Fig. 1. Map of the Eastern Desert with sites mentioned in the text. Drawing by M. Hense.

and a four week season in winter 2010. Study periods followed both the 2009 and 2010 excavations. This fieldwork built on eight previous seasons conducted from 1994 to 2001 by the University of Delaware (USA), Leiden University (the Netherlands) and UCLA (USA) [Sidebotham & Wendrich, 1995, 1996, 1998a, 1998b, 1999, 2000, 2001-2002, 2007; Sidebotham *et al.*, 2008; Bagnall *et al.*, 2000, 2005; Cappers, 2006].

Topographic survey

During the 2010 field season a total station survey located all trenches excavated since 1994 on a base plan of the site (Fig. 2). This placed the trenches more precisely than had been possible with earlier theodolite and transit surveys conducted between 1994 and 2001.

Geophysical surveys

The geophysical surveys expanded upon one initiated in 1999 [Herbich, 2007] and covered most of the western part of the site and much of the harbor located south and east southeast of the Ptolemaic industrial quarter (Fig. 3). The results have borne out, yet again, the usefulness of the magnetic method in providing clues about the location of subterranean features to depths of approximately one meter as well as the overall makeup of specific areas of the site. This adds some precision to the excavation process. Much of the present work was done in areas where little if anything on the surface indicated the presence of man-made features hidden under the sand. According to T. Herbich mapping inside the harbor basin revealed long parallel anomalies following the

[1] The following (in alphabetical order) provided funding for the three seasons: Institute for the Study of the Ancient World (New York University), John and Valerie Seeger, Jean and Thomas Sidebotham, Steven Sidebotham, William Whelan. The Research Center in Cairo of the Polish Center of Mediterranean Archaeology of the University of Warsaw and its Director Dr. Zbigniew Szafrański generously provided accommodations for team members and facilitated the expedition's logistics.

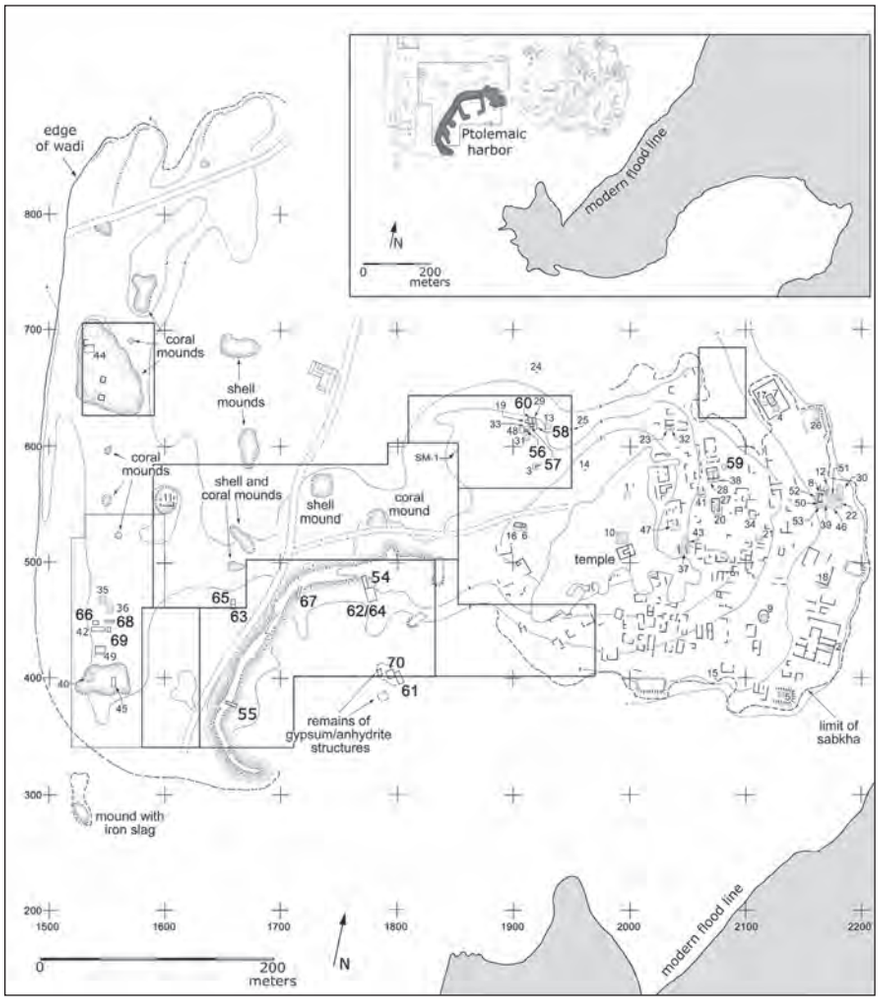


Fig. 2. Plan of Berenike with trenches from the 1994-2010 seasons. Drawing by Martin Hense. Location of trenches by Łukasz Wojnarowicz.

shape of the crescent-like ridge; these may show the receding shoreline as the basin slowly silted up. Structures seen at the southern end of the prospected area (trenches BE-10-61, 70 and related features) appear to be located in the middle of a magnetically "quiet" area, which most likely reflects that part of the harbor that remained under water until the end of occupation. The structures in trenches BE10-61, BE10-70 and related features, therefore, must have stood on a low island or dredge heap at the port entrance. Equally so, images of magnetic anomalies extending just inside the harbor ridge can now, following the present excavations, be interpreted as various equipment storage facilities which sprang up around the harbor as silting progressed. The most distinct images on the magnetic map are those corresponding to the urban architecture on the eastern shore of the harbor bay. The location of these buildings had been previously known from a topographic survey of the site; magnetic mapping has demonstrated a satisfactory concordance between the few architectural features seen in the original ground survey and the anomalies imaged on the magnetic map. More importantly, the anomalies, which reflect the magnetically-susceptible fill (containing most likely ashes and burnt sand) of buildings constructed of material entirely devoid of magnetic properties have delineated individual buildings with such precision that it is possible to read from the map the edifices' internal divisions, including doorways between particular rooms and courtyards, as well as streets that ran between structures. Plans are, eventually, for the geomagnetic survey to cover the entire town. More geoarchaeological testing with other methods will be conducted in the harbor area in order to determine a sedimentological history of this feature.

West of the harbor the survey mapped anomalies that can be interpreted as the corners of a homogeneous architectural complex measuring roughly 50-55 m (E-W) by 70 m (N-S). Part of this enclosure had already been noted in 1999 and subsequent excavation has left no doubt that the architecture is of Ptolemaic date. North of the harbor basin, in

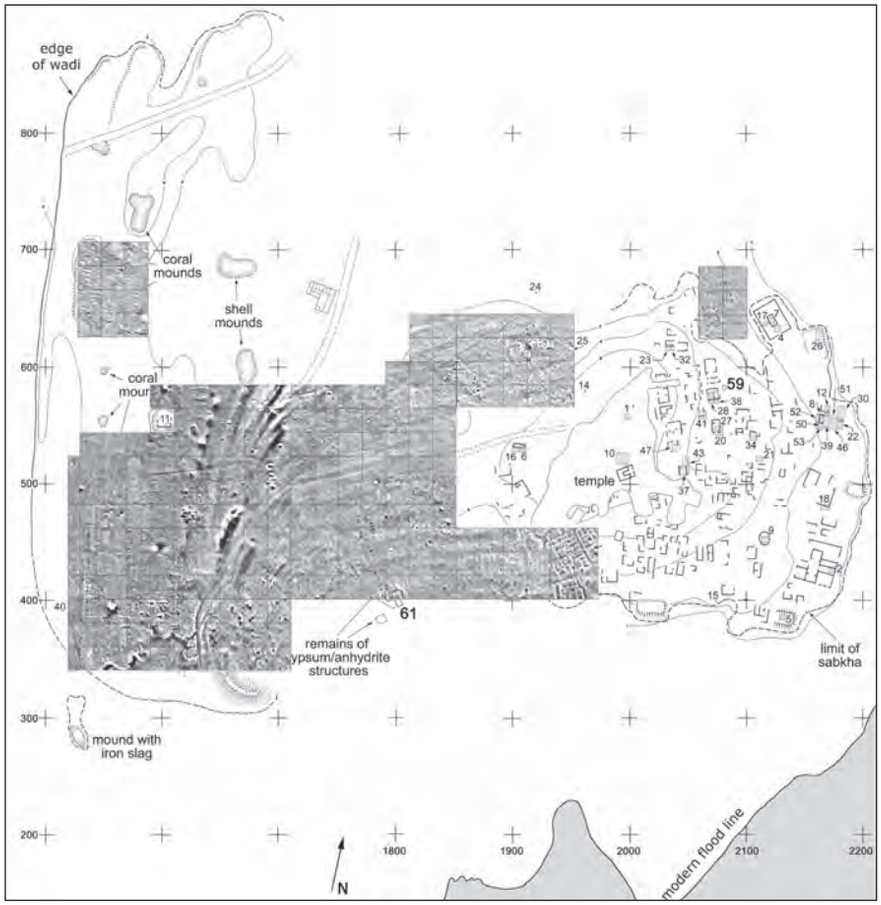


Fig. 3. Magnetic survey images of Berenike. Magnetic survey by Dawid Święch.

an area dotted with mounds covered with coral heads, potsherds, broken glass and copper alloy fragments, mapping has not brought very distinct results, although there are features reminiscent of buildings, which analysis of satellite images of this part of the site corroborates. Finally, a survey of a section of the mound around trench BE01-44, where a fourth to fifth century necropolis had been discovered, indicated the location of several other putative sepulchral structures.

Excavations

Excavations in 2009 and 2010 expanded our knowledge of the fresh water supply to the city, of small-scale industrial activities in both the early and late Roman eras, of contacts with Mesopotamia/the Persian Gulf, of the religious proclivities and ethnicities of some of the settlement's inhabitants, and of maritime activities in the harbor area itself. The brevity of the field seasons, however, permitted only limited surveying of the Eastern Desert hinterland.

Ptolemaic industrial area

Excavations continued in the Ptolemaic industrial area in the extreme western part of the site. Three trenches excavated in 2010 (BE10-66, BE10-68 and BE10-69) (Fig. 2 & 4) near BE01-42 revealed ditches, which were extensions of that V-shaped ditch first uncovered during the 2001 season (Sidebotham & Wendrich, 2001-2002: 26-27 & Fig. 4). Initial speculation held that this ditch was part of a retaining pen for pachyderms imported by sea from more southerly reaches of the Red Sea during the reigns primarily of Ptolemy II and Ptolemy III and, perhaps, later for use by the army [Sidebotham *et al.*, 2008: 162, 164-165 & Fig. 7.13; cf. Kistler 2006]. Although part of an elephant tooth was recovered from this area in an earlier excavation season and also during fieldwork in 2010 as a surface find, nothing definitive came from the excavations this season bearing on the original/primary function of this enigmatic ditch. Never-

Fig. 4. Trenches BE01-42 (right) and BE10-66 (left) looking east. Scale = 50 cm. Photo by S.E. Sidebotham.

theless, the presence of a large piece of folded lead 22.4 cm in diameter x 2.2-2.4 m thick with a hole 2.2-2.5 cm in diameter in the center and weighing 1.01 kg as well as a pottery dump containing a very limited repertoire of storage amphoras of Ptolemaic date (adding to a similar assemblage already known from various trenches in the vicinity) suggest that industrial activities took place in the immediate neighborhood.

Two trenches (BE10-63 and BE10-65) north of the harbor and east of the aforementioned "ditch" trenches were placed to understand the nature of high-amplitude anomalies revealed by magnetic surveying. Surprisingly, excavations encountered the skeletons of four dogs (Fig. 5). The skeletons had no artifacts associated with them and they appear to have been early Roman intrusive burials into an otherwise early Ptolemaic area. Nothing that could explain the presence of the magnetic anomalies was discovered, leading to the assumption that the cause of the mapped disturbances in the Earth's magnetic field was some kind of natural ground formation rather than anything man-made.

Fig. 5. Photo of dog skeleton in trench BE10-63 looking southwest. Scale = 20 cm. Photo by S.E. Sidebotham.

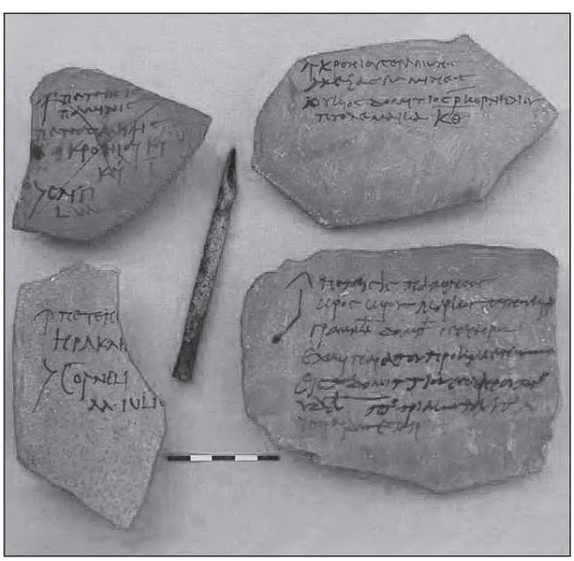
Urban water supply

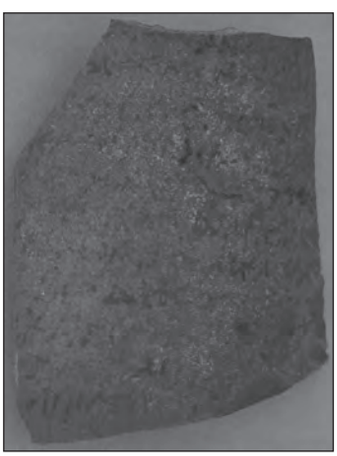
Approximately 240 ostraca excavated from the early Roman-era trash dump north of the city center (trenches BE09-56 & 57 and BE10-58 & 60) recorded details about fresh water supply to Berenike in the first century AD (Fig. 6). The archive reveals the importance of the Roman military in the entire process (personal communication from R.S. Bagnall and R. Ast). Use of infra-red photography enhanced readings of some of the texts (Fig. 7-8) [cf. Bülow-Jacobsen, 2008]. A detailed study of these documents is underway.

Fig. 6. Four ostraca detailing fresh water supply to Berenike and a reed writing pen from the early Roman trash dump. Scale = 5 cm. Photo by S.E. Sidebotham.

Fig. 7. Ostracon no. A-146 (dealing with fresh water supply to Berenike) taken as a normal digital photograph. Photo by S.E. Sidebotham.

Fig. 8. Ostracon no. A-146 (dealing with fresh water supply to Berenike) taken as an infra-red photograph. Photo by S.E. Sidebotham.





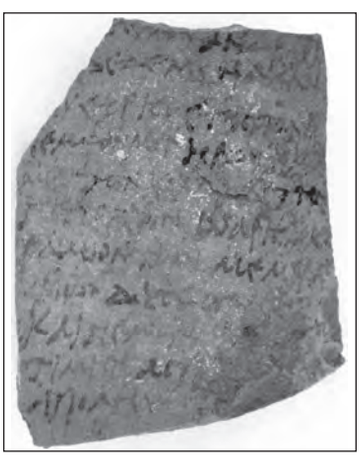


Fig. 9. South Arabian graffito of early Roman date. Each black and white increment on the scale = 1 cm. Photo by S.E. Sidebotham.

Fig. 10. South Arabian graffito of early Roman date. Scale = 5 cm. Photo by S.E. Sidebotham.

Inhabitants of Berenike: commercial activities and ethnicities

Documentation of graffiti of some pre-Islamic South Arabian language scratched on sherds of South Arabian provenance from a first-second century AD context (Fig. 9 & 10) confirmed contacts between Southern Arabia and Berenike; one graffito had a close parallel with an early Roman specimen recorded from British excavations at Myos Hormos, about 300 km north of Berenike [Tomber, 2008: 75, Fig. 13 left; Tomber *et al.,* forthcoming]. These graffiti represent the twelfth written language recorded thus far from excavations at Berenike. Wood from the genus *Boswellia*, the tree that produces frankincense, also derived from an early Roman context (personal communication from J. Zieliński). Excavations (trench BE10-59) in a late Roman trash dump deposited atop, inside and outside abandoned buildings in the late Roman commercial-residential area recorded a small bronze coin whose identification remains unknown. The obverse bust had a lunate-shaped crown, which has parallels with some Aksumite issues, but the reverse had no discernable parallels with either South Arabian or Aksumite coins (Fig. 11 & 12).[2] Perhaps this is a barbarous copy of some Aksumite coin or other prototype. This unusual specimen represents only one of a handful of non-Ptolemaic/non-Roman coins documented from ten seasons of excavations at Berenike. In addition, analysis of samples of vesicular basalt undoubtedly used as ships' ballast from the harbor area

Fig. 11. Obverse of an *aes* coin from late Roman trash dump trench BE10-59. Each black and white increment on the scale = 1 cm. Photo by S.E. Sidebotham.

Fig. 12. Reverse of an *aes* coin from late Roman trash dump trench BE10-59. Each black and white increment on the scale = 1 cm. Photo by S.E. Sidebotham.

[2] For Aksumite coins see Munro-Hay (1986), Munro-Hay (1999), Munro-Hay and Juel-Jensen (1995), for South Arabian coins see Hill (1965).

Fig. 14. Carved turtle shell fragments from late Roman trash dump trench BE10-59. Scale = 5 cm. Photo by S.E. Sidebotham.

Fig. 13. Scattering of vesicular basalt on the surface of the harbor area at Berenike. View looking southeast. Photo by S.E. Sidebotham.

of Berenike (Fig. 13) indicated a provenance of Qana' [Peacock *et al.,* 2007: 59; personal communication from J.A. Harrell], an important Indian Ocean emporium on the southern coast of Arabia (modern Yemen) active from at least the first century BC to the seventh century AD [Sedov, 2007]. Clearly, at least some ships sailed between Berenike and Qana' in the early Roman period; Qana' was a primary destination to acquire frankincense [cf. *Periplus Maris Erythraei* 27] as well as an intermediate stop enroute to/from India or, less likely, the Persian Gulf.

Small-scale industrial activities took place in abandoned areas of the western part of the harbor (trench BE10-55) in the first and second centuries AD. These included manufacture of items made of mother-of-pearl, mica, beryl, sard and obsidian. A late Roman (late fourth through late fifth/sixth century) trash dump located in the late Roman commercial-residential part of the city and immediately northeast of trenches BE99-28/BE00-38 was substantial and excavations there (trench BE10-59) produced a bonanza of ecofacts, and both organic and inorganic artifacts. Sizeable quantities of scraps of discarded and clearly worked leather, wood, animal horn and turtle shell (Fig. 14) signaled the presence of small scale industries using these materials at that time in this part of the city. The *Periplus Maris Erythraei* (3, 4, 7, 10, 13, 15, 16, 17, 30, 33, 56, 61, 63) indicates that tortoise/turtle shell was an item commonly available and traded at emporia throughout the Red Sea and Indian Ocean [cf. Casson, 1989: 101-102] in early Roman times and Berenike must now be added to that list of ports, at least in the late Roman period.

Excavations in late Roman trash dump trench BE10-59 produced over 1000 beads, many of which were the Indo-Pacific type. There were also beads of local origin, as well as noticeable amounts of gold beads from the early Roman period and beads made of various semiprecious stones (carnelian, garnet, and crystal) (**Pl. A1 - A2 - A3**). The late Roman trash deposit also produced banded agate cameo blanks imported likely from the Barygaza region of India [Gupta *et al.,* 2004: 32] and found elsewhere in India [Francis, 2004: 492 (Fig. 7.31) for Arikamedu and personal observations of S.E. Sidebotham at Pattanam]; those from the late Roman trash deposit were, however, much smaller than had been found during earlier excavation seasons at Berenike [cf. Harrell, 1998: 143-144; Harrell, 1999: 112]. Documentation of peppercorns, coconut husks and resist-dyed Indian textiles (Fig. 15) from the late Roman trash amply illustrate continued and vibrant contacts with South Asia at that time. A coarse ware sherd had been incised prior to firing with

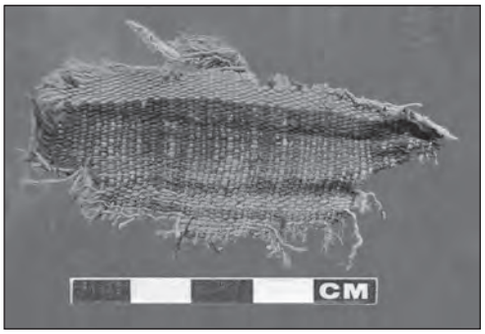


Fig. 15. Resist-dyed cotton textile from late Roman trash dump trench BE10-59. Scale = 5 cm.
Photo by S.E. Sidebotham.

Fig. 16. Coarse ware sherd with swastika decoration from late Roman trash dump trench BE10-59. Scale = 5 cm.
Photo by S.E. Sidebotham.

Fig. 17. Eastern Desert Ware from late Roman trash dump trench BE10-59. Scale = 5 cm.
Photo by S.E. Sidebotham.

Fig. 18. Fragment of a painted wooden box lid from late Roman trash dump trench BE10-59. Scale = 5 cm.
Photo by S.E. Sidebotham.

a swastika (Fig. 16), a symbol prevalent throughout South Asia for some millennia. Close parallels for this swastika appear on pottery and coins documented from early historic sites in South Asia (especially southern India and Sri Lanka) and these have trade-related implications [Rajan, 2008: 28, 29 (Fig. 3), 30, 31 (Fig. 5), 32, 139 (Plate 3, bottom)]. A similar swastika had been carved into a late Roman-era Aswan bowl fragment, but that sherd was, unfortunately, a surface find. Excavations in late Roman trash dump BE10-59 also documented additional outstanding examples of hand-made and burnished Eastern Desert Ware (**Pl. A4** & Fig. 17) and portions of a circular wooden box lid painted in red, black, yellow and green (Fig. 18); the latter has parallels from various Coptic sites in Egypt, including Naqlun in Fayum Oasis (I. Zych personal observations).

Both early and late Roman trash dumps contained a number of examples of early Roman *millefiore* glass (vessels, inlays and beads) and other types of fine glassware including significant amounts of sophisticated cast and facet cut colorless examples (goblets, beakers, dishes and bowls). There were also enameled specimens (cups and beakers), as well mould-blown vessels (beakers and toilet flasks). Luxury techniques of gilding and cameo glass (both early and late Roman, as well as blanks) were present in this material. Ordinary household wares in the shape of thick-walled containers (some with molded bases), *unguentaria* of various shapes, and late Roman conical lamps, many with blue glass attachments, were also recorded (**Pl. A5** & Fig. 19-20); also documented were samples of *lapis specularis* (windowpane stone) (personal communication from R. Kucharczyk). Glass, both raw and fine finished products, was among the important export items from the Roman world to other areas of the Red Sea and Indian Ocean [*Periplus Maris Erythraei* 6, 7, 17, 39, 49, 56; cf. Casson, 1989: 20-23, 40-41, 111-112, 126-127].

An oval-shaped finger ring gemstone incised with a seated female winged sphinx was a surface find near the early Roman trash deposit (**Pl. A6**); it dates to the second half of the first century BC (personal communication from G. Platz-Horster). Identification of fragments of Mesopotamian-made "torpedo" jars from the late Roman trash dump indicates interaction with the Persian Gulf at that time [personal communication from R.S. Tomber; cf. Tomber, 2007]. While this contact was likely by sea via Indian Ocean ports in southern Arabia such as Qana' or Sumhuram/Khor Rori, their arrival at Berenike by some overland route cannot be ruled out.

Fig. 19 and 20. Early and late Roman glass fragments. Scales = 5 cm.
Photos by S.E. Sidebotham.

Religious activities

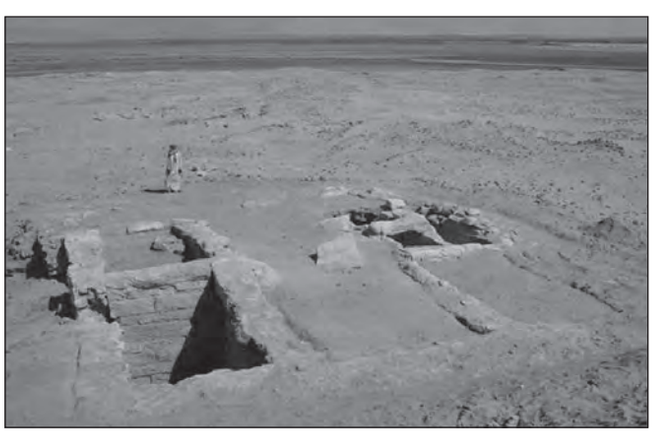
Sometime in late 2007 or early 2008 vandals dug robber holes in the Serapis Temple and its environs. As a result, during the 2009 and 2010 seasons, the project initiated a study of the temple (Fig. 21 & 22) the only previous and incomplete records of which had been made in the nineteenth and early twentieth centuries when the sanctuary was "cleared" on a number of occasions [cf. Meredith, 1957]. Our on-going project aims to produce as complete a plan, elevation drawings and photographic record as possible of this important edifice.

Excavation of a structure in what appeared to be the middle of the harbor south and east southeast of the Ptolemaic industrial area identified a late Roman-era temple (Trench BE10-61 complex) (Fig. 23 & 24). The structure had at least two phases of use. Fieldwork identified an earlier phase that included rows of benches parallel to the interior eastern and western walls of the temple; this remained unexcavated at the conclusion of the 2010 season (Fig. 25). Excavations in trenches BE98/99-23/BE99-32 revealed a late fourth/early fifth century AD religious shrine that also had rows of low benches parallel to the interior walls [Sidebotham, 2007: 79 (Figure 4-45, Plate 4-46), 80 & Plate 4-47; 81 (Figure 4-48, Plate 4-49, 83)] very similar to those that began to appear in the harbor temple complex.

The latest phases of this harbor temple were, according to the ceramic finds, fourth to sixth centuries, with most activity undoubtedly occurring in the fifth century. The presence of a late Roman-era temple in this location suggests, and the geomagnetic survey described above seems to corroborate, that the edifice had been constructed on an island or dredge heap. The temple, built of coral heads and ashlars of gypsum/anhydrite, preserved a single portal at the southern end. The interior dimensions of this edifice were 8.5 m N-S x 4.0 m E-W. Excavations also recorded approximately 50 cowry shells 31 of which lay clustered at the single narrow entrance on the southern side of the building (Fig. 26). Many of these

Fig. 21. Serapis temple. View looking southeast. Photo by S.E. Sidebotham.

Fig. 22. Serapis temple. Detail of one of the rooms. View looking east.
Photo by S.E. Sidebotham.



shells had either been pierced, probably to be strung and hung on a wall, from the ceiling or from one of the other decorative features of the cult center; many of those in the doorway had the longitudinal portions of their tops deliberately removed. The goddess Isis was known as a powerful magician-healer who regularly cast spells and used charms [McCabe, 2008: 20]; the most obvious and powerful demonstration of these powers was her resurrection of Osiris [Wilkinson, 2003: 147]. Isis' followers used cowry shells in divination/prognostication so the discovery of the shells here suggests that such activities took place in this harbor temple. Undoubtedly, those about to venture to sea would have wanted to know what lay in store for them and prognostication in a harbor temple close to where they would be embarking for their dangerous voyages would have alleviated, to some extent, the angst many felt prior to departure. That this non-Christian religious facility would still be operational long after the issuing of several Theodosian decrees in the later fourth century ordering closure of such pagan facilities [Frankfurter, 1998: 23-27] is not at all unusual. Throughout Berenike pagan temples remained open in this later period [Sidebotham & Wendrich, 1998b: 93-95; Sidebotham & Wendrich, 2001-2002: 29-35]. Elsewhere in Egypt Isis temples also continued to operate after the Theodosian fiats had been issued [Frankfurter, 1998: 40-41, 104-106].

Bones found inside the temple were ovicaprid and all indicated that they had been sacrificed by the age of four weeks (personal communication from M. Osypińska). Likely, those setting out on or returning from long and dangerous voyages paid homage to this multi-faceted deity in a variety of ways.

Ashlar blocks made of white gypsum/anhydrite formed the outer face of the northern wall of the temple exposed in trench 61 complex with fossilized coral heads comprising the inner face (Fig. 27). This unique building style has been documented nowhere else in excavations at Berenike. White gypsum ashlar blocks also formed the wall at the extreme northeastern interior corner of the harbor temple. Excavations in trench 70, adjacent to and northwest of the temple in trench 61 complex, documented numerous sizable tumbled white gypsum/anhydrite ashlars (Fig. 28). Some of the ashlars preserved the remains of wooden clamps originally used to "tie" the blocks together. Immediately west of this tumble was an open area rectilinear in plan surrounded by numerous white gypsum/

Fig. 23. Harbor temple in trench BE10-61 complex. View looking southwest. Scale = 50 cm. Photo by S.E. Sidebotham.

Fig. 24. Harbor temple in trench BE10-61 complex. Detail of southwestern corner. View looking southwest Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 25. Harbor temple in trench BE10-61 complex. Tops of benches of earlier phase. Scale = 50 cm. View looking northwest. Photo by S.E. Sidebotham.

Fig. 26. Entrance into harbor temple in trench BE10-61 complex with cowry shells *in situ*. View looking north. Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 27. Northern wall of harbor temple showing inner face of coral heads and outer face of gypsum/anhydrite ashlars. View looking north. Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 28. Trench BE10-70 looking north northeast. Portions of harbor temple (trench BE10-61 complex) visible to right.
Photo by S.E. Sidebotham.

Fig. 29. Open square area west of trench BE10-70 and harbor temple. View looking east. Scale = 50 cm.
Photo by S.E. Sidebotham.

Fig. 30. Small jar containing thin pieces of silver decoration found in southwestern corner of the harbor temple. Each black and white increment on the scale = 4 cm.
Photo by S.E. Sidebotham.

Fig. 31. Thin pieces of silver decoration from the small jar found in the southwestern corner of the harbor temple. Scale = 5 cm.
Photo by S.E. Sidebotham.

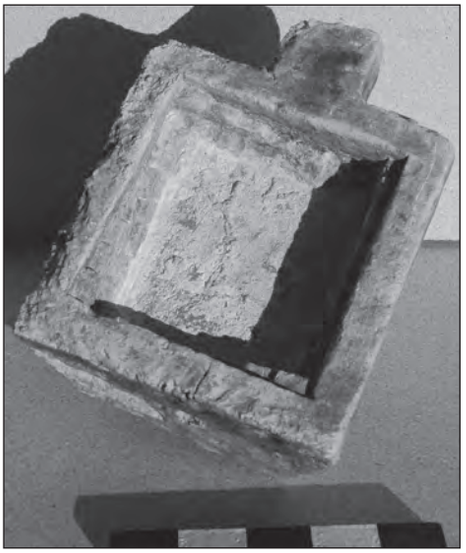
anhydrite blocks (Fig. 29). Excavations documented only the uppermost/latest surface loci of trench 70 and the adjacent area; dates of these strata were late Roman, fifth possibly into the sixth centuries AD. Yet, the white gypsum ashlars here appear to date much earlier than late Roman times; they may have been originally part of a Ptolemaic or early Roman edifice. It is likely that the Isis temple in its latest phases made some use of an earlier structure comprising white gypsum/anhydrite ashlars.

The only other structure thus far recorded at Berenike made almost entirely, if not completely, of white gypsum/anhydrite ashlars is the Serapis temple at the highest part of the site. The similarity in building materials and construction techniques of the Serapis temple and the structure/s adjacent to the harbor temple suggest a contemporary date for both. Perhaps these structures were part of the same building project initiated, likely, sometime during the Ptolemaic-early Roman period. The reigns of Ptolemy VI-VIII (180-116 BC) witnessed much temple building throughout Egypt [Hölbl, 2001: 257, 259]; perhaps the Serapis temple and structure in trench 70 and environs were originally erected as part of a widespread Ptolemaic construction project at that time.

Immediately inside and in the extreme southwestern corner of the late Roman-era harbor temple excavations documented a small closed-form coarse ware jar that had a lid comprising the base of another coarse ware vessel. The small container preserved the remains of about 50 thin curved and repoussée-decorated pieces of silver resembling *lunulae* in shape (Fig. 30); many of these preserved the remains of nail holes and some of the small bronze nails were still extant in the holes (Fig. 31). The material adhering to some of the nails and interiors of the silver pieces was neither wood (personal communication from J. Zieliński) nor bone (personal communication from M. Osypińska). The holes for the nails were made from inside out, while the nails were inserted from the outside in. One double-piece appeared to be connected together. A careful study of the sizes of these silver pieces should reveal whether they were three-dimensional ornaments and if the material inside them was a type of adhesive or filling substance designed to give the ornaments some weight. Perhaps these delicate pieces of silver once adorned the shrine.

This harbor shrine contained a recycled inscription of Trajan dedicated to Isis, Tyche and perhaps Serapis (personal communication from R.S. Bagnall: Fig. 32) during the emperor's first year on the throne (98 AD). The emperor's name had been misspelled. Unfortunately, the right hand portion of the text had been destroyed by exposure to excessive amounts of moisture after the inscription had been reused. Excavations in trench BE00-37 also documented an inscription dedicated to Isis made by a secretary and translator, also during the reign of Trajan [Sidebotham, 2007: 126, 127 (Plate 4-100 & Figure 4-101), 128, 129; Bagnall *et al.,* 2005: 27-28 (no. 121)]; it had also clearly been recycled from its original context. This stone from trench BE00-37 was, however, too large to have been from the "harbor temple" and must derive from some other shrine dedicated to Isis located elsewhere in the city that has yet to be identified.

Additionally, there were stone temple pools (Fig. 33), close parallels for which had been excavated in Berenike previously in Trenches BE95-6 [Sidebotham, 1996: 86 (Figure 3-63), 87 (Figure 3-64), 88 (Figure 3-65), 92, 93 (Figure 3-68)] and BE98-23 [Sidebotham, 2000: 137, 138 (Figure 2-92), 139 (Figure 2-93), 140 (Plate 2-94), 141 (Plate 2-95), 142 (Plate



2-96)]. Both trenches BE95-6 and BE98-23 were late Roman religious cult centers. The larger of two temple pools from the harbor shrine excavated in 2010 appeared abutting the aforementioned Trajanic inscription while a smaller one in poor condition had been recycled upside down and propped up one of the stone altars found at the extreme northwestern interior of the edifice. Water played an important role in the cults of both Isis and Serapis [Wild, 1981] and the documentation of miniature stone temple pools from this edifice fits nicely with the cult/s honored here.

The harbor temple in the trench BE10-61 complex also preserved stone altars (Fig. 34), one of which contained ashes and a bone from the final sacrifice; it had clearly been in use for some time as it had been cut down and its original base was missing. This particular altar had carved on its sides decoration forming a "V" shaped motif (Fig. 34, altar in foreground). This may be a stylized representation of bull or ibex horns. Other finds included a terracotta incense burner (Fig. 35), "Frog" type terracotta oil lamps (Fig. 36), a bronze *patera*/*phiale* with traces of an iron tripod attached (**Pl. A7**), a pair of extremely thin, decorated bronze handles (Fig. 37) and remains of wooden bowls (Fig. 38); numerous parallels for the latter have been documented from early and late Roman pagan cult centers in Berenike in previous seasons [Sidebotham, 1999:

Fig. 32. Inscription recording dedication to Isis, Serapis and perhaps Tyche in first year of the reign of Trajan. Scale = 50. Photo by S.E. Sidebotham.

Fig. 33. Stone temple pool from the harbor temple. Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 34. Stone altars in the northwestern corner of the harbor temple. Note bronze *patera*/*phiale in situ*. View looking northwest. Scale = 20 cm. Photo by S.E. Sidebotham.

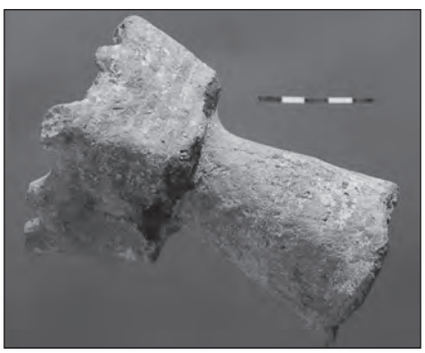


Fig. 35. Terracotta incense burner from the harbor temple. Scale = 5 cm. Photo by S.E. Sidebotham.

Fig. 36. "Frog" type terracotta oil lamps from the harbor temple. Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 37. Thin bronze handles from the harbor temple. Scale = 5 cm. Photo by S.E. Sidebotham.

Fig. 38. Remains of wooden bowls (outlined in white) in the harbor temple. View looking north northeast. Scale = 50 cm. Photo by S.E. Sidebotham.

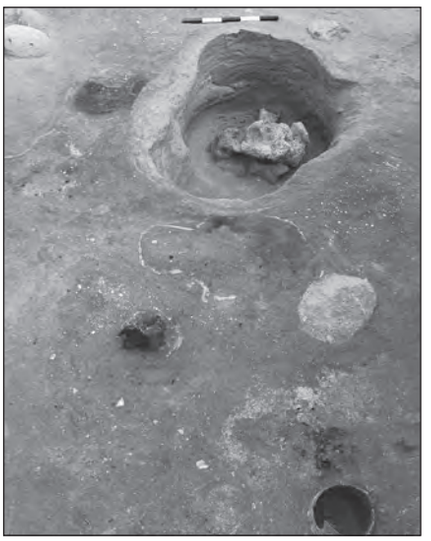


Fig. 39. Leaning column at northern central part of the harbor temple. Note stone altars and bronze *patera*/*phiale*. View looking west northwest. Scale = 50 cm. Photo by S.E. Sidebotham.

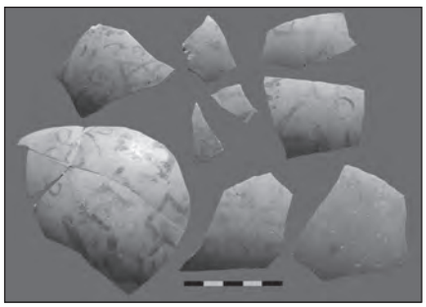


Fig. 40. Some of the painted ostrich egg fragments from the harbor temple. Scale = 5 cm. Photo by S.E. Sidebotham.

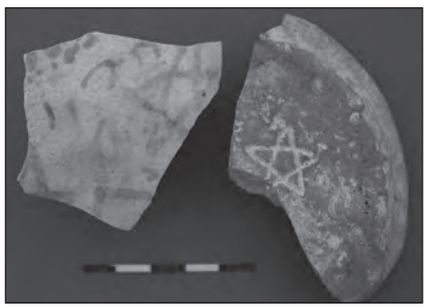


Fig. 41. Painted ostrich egg shall and bottom of a terracotta lamp with pentagram/five pointed star decoration. From the harbor temple. Scale = 5 cm. Photo by S.E. Sidebotham.

Fig. 42. Painted ostrich egg shell painted with an *omega*-shaped anchor. Each black and white increment on the scale = 1 cm. Photo by S.E. Sidebotham.

67, 70-74, 77, 78, 80; Sidebotham, 2000: 64-65, 140; Sidebotham, 2007: 75, 79 (Figure 4-45 no. 7 & Plate 4-46), 80, 83].

A column, still upright (Fig. 39), but leaning slightly, stood at the central northern-most interior end of the harbor temple immediately east of the aforementioned stone altars. The top of the column was not preserved, but may originally have been used as an altar. Previous excavations recorded a similar type of column-altar, with burning extant, in the late fourth/early fifth century shrine in trenches BE98/99-23/BE99-32 [Sidebotham, 2000: 136 (Figure 2-90), 137, 138 (Figure 2-92), 139 (Figure 2-93), 140 (Plate 2-94), 141 (Plate 2-95), 142 (Plate 2-96); Sidebotham 2007: 79 (Figure 4-45 no. 7, Plate 4-46, Plate 4-47, Figure 4-48 no. 9].

Ostrich eggshell fragments found throughout the trench, but especially near the leaning column, preserved apparent magic/religious incantations in red paint (Fig. 40). The quantities of shell fragments suggested the presence of two eggs, which, since prehistoric Egyptian times, represented eternal life, rebirth and resurrection, and this religious and funerary affiliation continued into the Christian and Islamic eras [Green, 2006]. A pentagram/five pointed star appeared painted on one of the eggshell fragments and scratched as a graffito on the bottom of a terracotta lamp fragment from the temple (Fig. 41); these pentagrams likely represent the Dog Star Sopdet/Sothis/Sirius, another symbol identified with Isis [Witt 1971: 15, 19; Plates 63-64; Pinch 2002: 151; Wilkinson, 2003: 147, 167-168]. The appearance of Sirius in the heavens marked the start of the New Year and the beginning of the Inundation season in Egypt, both associated with Isis [Witt, 1971: 15, 19; Pinch, 2002: 151; Wilkinson, 2003: 147, 168]. An anchor-like design, also painted in red, appeared on one of the ostrich eggshell fragments (Fig. 42), an allusion, perhaps, to the maritime commerce that was Berenike's raison d'être. Isis was protectress of sailors and harbors, and the *Navagium Isidis*/*Ploiaphesia* ceremony, which opened the sailing season each year in the Mediterranean in Roman times [Witt, 1971: 101, 179; Dunand, 1973: 223-230], must also have resonated in the Red Sea maritime environment.

Ships and the long distance trade

There has been much speculation about the appearances, sizes, materials and methods of construction of Ptolemaic and Roman ships that sailed in the Red Sea. New data has recently been recorded about Middle and early New Kingdom ships sailing between Egypt and Punt, es-

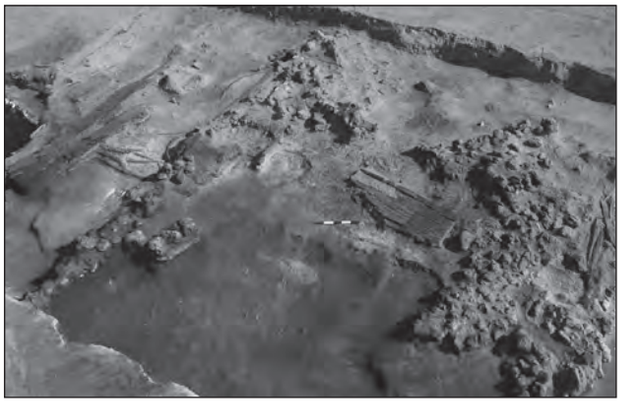


Fig. 43. Ship timbers from near the Serapis temple.
Photo by S.E. Sidebotham.

Fig. 44. Ship timbers, ropes and other maritime-related gear from the harbor area. View looking northeast. Scale = 50 cm.
Photo by S.E. Sidebotham.

Fig. 45. Ship timbers, ropes and other maritime-related gear from the harbor area. View looking northeast. Scale = 50 cm.
Photo by S.E. Sidebotham.

Fig. 46. Ship timbers from the harbor area. View looking southwest. Scale = 5 cm.
Photo by S.E. Sidebotham.

Fig. 47. Detail of ship timbers showing mortise-and-tenon construction, from the harbor area. Scale = 5 cm.
Photo by S.E. Sidebotham.

pecially from excavations conducted at 'Ain Sokhna just south of Suez [personal observations of authors; Abd el-Raziq *et al.,* 2006] and at Wadi Gawasis [personal observations of authors; Bard and Fattovich, 2007], which lies between Safaga and Quseir. Several ancient authors describe local and regional ship building traditions in more southerly areas of the Red Sea and in the Indian Ocean in the early and late Roman eras

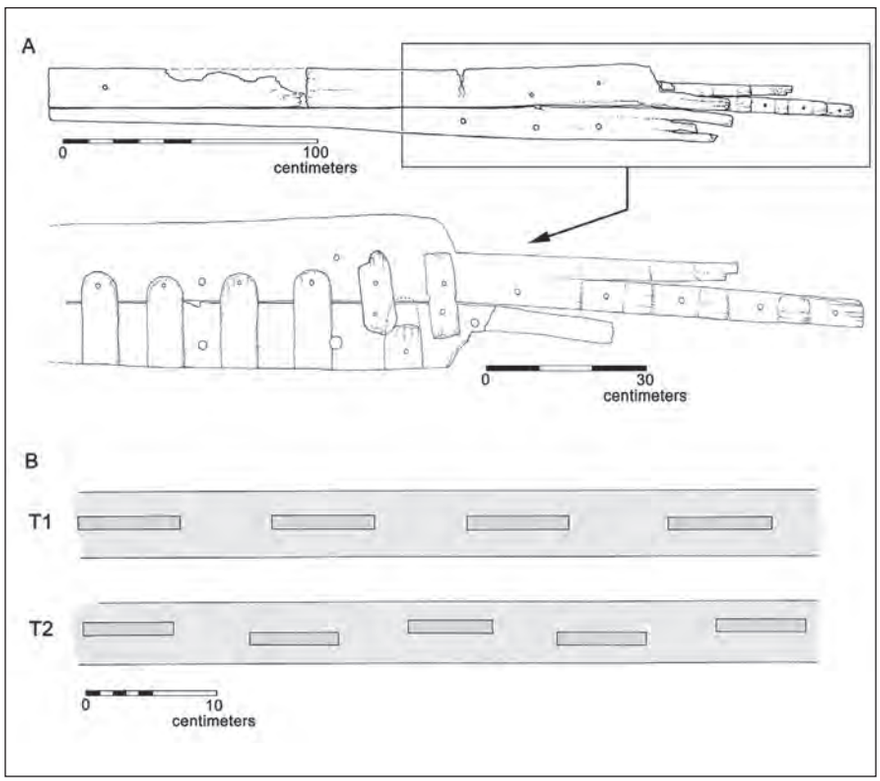


Fig. 48. Drawing of ship timbers showing mortise-and-tenon construction, from the harbor area.
Drawing by M. Hense.

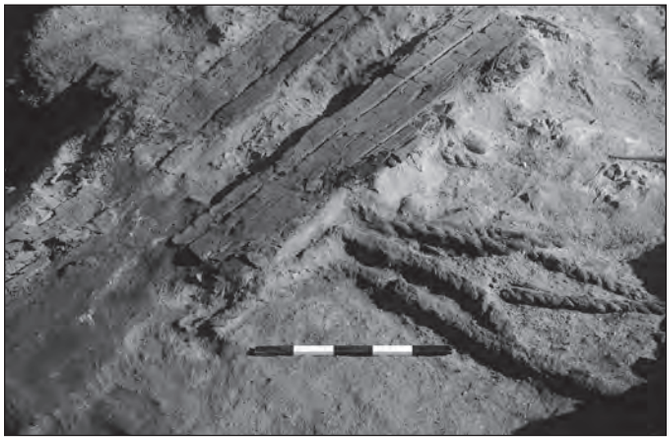


Fig. 49. Ropes and ship timber from the harbor area. View looking northwest. Scale = 50 cm. Photo by S.E. Sidebotham.

Fig. 50. Ropes and ship timbers from the harbor area. View looking northeast. Scale = 50 cm. Photo by S.E. Sidebotham.

[*Periplus Maris Erythraei* 15-16, 27; Procopius, *History of the Wars* 1.19.23-26]. Yet, for the Ptolemaic and Roman period ships sailing the Red Sea we have only very brief descriptions of ancient classical writers [cf. *Periplus Maris Erythraei* 10] and speculation from specialists in the field [cf. Casson, 1989: 35, 291]. No Ptolemaic or Roman shipwreck has ever been scientifically excavated in the Red Sea [cf. Pedersen, 2000]. Ptolemaic or Roman ship timbers had been recorded previously at Berenike, but these comprised recycled teak timbers with dowel holes, likely evidence of mortise-and-tenon construction, used to stabilize walls of structures in the late Roman city [Sidebotham, 1999: 26; Vermeeren, 1999; Sidebotham, 2000: 21; Vermeeren, 2000]. The project found some cedar timbers of unknown date (one of which measured 2.33 m long) with apparent dowel holes and iron nails, recycled in some architectural function near the Serapis temple (Fig. 43). While lead sheathing for merchant ships, so typical of the Mediterranean, sails, brailing rings and other maritime-related gear had previously been recorded from excavations at Myos Hormos [Whitewright, 2007] and Berenike [Sidebotham, 2008], nothing of the timbers from early Roman vessels had been documented from anywhere in the Red Sea region until the 2010 season at Berenike. Field analysis of first to second century AD timbers (Fig. 44-46) excavated in the harbor area, some measuring as long as 3.15 m, indicated that they were cedar, originating from Lebanon, and that they were joined together using a close fitting mortise-and-tenon construction technique very typically found in the Mediterranean at that time (Fig. 47 & 48). In addition, large ropes made of palm fiber averaging 6-6.5 cm in diameter with individual lengths up to 13 m long, and clearly used in a maritime capacity, lay strewn among the timbers (Fig. 49 & 50). Also among the finds were baskets and matting. Some of the latter had clearly been used in a ground insulating capacity. Slightly over 11 kg of obsidian, clearly imported, perhaps from a more southerly region of the Red Sea, were found strewn among the ropes, ship timbers, baskets and matting. The *Periplus Maris Erythraei* (5) [cf. Casson, 1989: 109; De Romanis, 1996] notes obsidian as an article for trade, but does not indicate what function it served. The precise cutting qualities of sharpened obsidian tools are well known and it may have been that the obsidian from the harbor was destined for cutting in the leather, bone, turtle/tortoise shell and wood industries that were part of Berenike's economy.

A bollard *ca*. 66 cm visible height x 24-31 cm in diameter made of cedar lay just northwest of the ship timbers (Fig. 51), ropes and other maritime paraphernalia indicating that ships or lighters still tied up to this more easterly portion of the harbor in the first and second centuries AD. Remains of a resinous material covered much of the matting and stones in the area adjacent to the bollard suggesting an attempt to waterproof or stabilize those surfaces. Near the bollard excavations documented two blocks of Syrian fir tree resin (*Abies cilicica*) (personal communication from J. Zieliński). One block weighed 190 g and the other 339 g. This resin, produced in areas of greater Syria and Asia Minor, and its oil were used extensively in antiquity for mummification, as an antiseptic, a diuretic, to treat wrinkles, extract worms and promote hair growth [Manniche, 1999: 64-65].

Fig. 51. Cedar wood bollard in the harbor area. View looking south. Scale = 20 cm. Photo by S.E. Sidebotham.

Fig. 52. Foundations of a structure in Khor Wadi Lahami. View looking north. Photo by S.E. Sidebotham.

Desert hinterland survey

The project's Eastern Desert survey recorded several sites (Fig. 1). One, located near Berenike in Khor Wadi Lahami at (24° 12.34.6' N/35° 24.34.4' E) lay west of the asphalt highway and opposite the entrance to the Lahami Bay Hotel. Ruins here comprised the foundations of a small structure built of white porous limestone obtained from near the Red Sea coast. This architectural feature was rectangular/trapezoidal in plan with outside measurements of *ca.* 4.70 m N-S x 8.80 m E-W (Fig. 52). The structure had been dismantled down to its foundations. Those ashlars remaining *in situ* formed walls ranging in thickness from *ca.* 0.35 to 0.45 m. Much of the stone from this structure had been recycled into nearby cairns, which were adjacent to a camel track. The associated sherds were few and mostly non-diagnostic; fragments of Late Roman Amphora 1 could be dated fifth century AD according to project ceramologist R.S. Tomber. Several graves, apparently ancient in date and undisturbed, lay to the east of the dismantled structure; the best preserved of these was at 24° 12.34.6' N/35° 24.37.3' E.

Another site, first recorded by J.A. Harrell, lay at 24° 32.26.9' N/34° 44.41.3' E (approximate middle of the site) *ca.* 750 m SE of the center of the major settlement at Kab Marfu'a and overlooking Wadi Gemal (Fig. 53 & 54). The survey named this settlement Kab Marfu'a East. Analysis of surface ceramics by R.S. Tomber indicated activity here between the second and fifth century AD, contemporary with Kab Marfu'a [cf. Sidebotham *et al.,* 2005]. In addition to sherds, the survey also gathered pieces of beryl and bi-valve shells, indicating some contact with the Red Sea.

Kab Marfu'a East comprised approximately 60-70 structures ranging from single-roomed to multiple-roomed edifices. Maximum preserved wall height was ca. 2.0 m; walls were ca. 0.50-0.70 m wide with outer

Fig. 53. Kab Marfu'a East. View looking southeast. Photo by S.E. Sidebotham.

Fig. 54. Kab Marfu'a East. View looking south. Photo by S.E. Sidebotham.

Fig. 55. Kab Marfu'a East. Building with niches. View looking north. Photo by S.E. Sidebotham.

Fig. 56. Kab Marfu'a East. Circular tomb and adjacent structures. View looking north. Photo by S.E. Sidebotham.

faces comprising larger cobbles and the cores of smaller cobbles and pebbles, a construction style typical of the Eastern Desert. Building methods included both free-standing and those that had large boulders as at least one of their walls. A number of the rooms had extant niches and alcoves (Fig. 55) similar to those at Kab Marfu'a, Sikait and Shenshef. In approximately the center of the site was a large circular grave built of stacked cobbles and small boulders measuring approximately 1.25 m high x *ca.* 4.8-4.9 m in diameter (Fig. 56). The internal chamber was visible, but too filled in with fallen stones to determine if it was for a single or multiple burials. The function of Kab Mafu'a East was not obvious, but may have been analogous to Kab Marfu'a, *viz.* as a beryl/emerald processing center; certainly, there was no evidence of mining at this site. The survey intends to draw a detailed plan of Kab Marfu'a East during a future field season.

J.A. Harrell alerted the survey to the existence of a small settlement at Rikez Allah at 24° 17.912' N/34° 26.216' E. Comprising 14-15 structures, some with multiple rooms, courtyards and interior walls preserving niches, the buildings at Rizek Allah had maximum extant wall heights of 1.50 m and widths varying from about 60 to 70 cm (Fig. 57 & 58). The presence of quartz hand grinders suggested some type of ore processing though the survey documented no mines in the vicinity. R.S. Tomber dated the surface pottery collected here from the late fourth into the fifth century AD.

J.A. Harrell also reported his discovery of an ovoid-shaped feature in Wadi Khashab. The Berenike survey visited the site, which measured about 19 m N-S x 21 m E-W (at 24° 19.396' N/34° 31.477' E) and comprised a series of sharp pointed, relatively long, but narrow upright stones (maximum preserved height 1.40 m) enclosing a core of smaller cobbles and boulders. Entrances to this ovoid feature appeared on the

Fig. 57. Rizek Allah. View looking northwest. Photo by S.E. Sidebotham.

Fig. 58. Rizek Allah. View looking north. Photo by S.E. Sidebotham.

Fig. 59. Wadi Khashab ovoid enclosure containing cattle bones. View looking north. Photo by S.E. Sidebotham.

southeastern and northern sides and the interior comprised a series of burials (Fig. 59). Five sizeable robber holes appeared inside the enclosure, one of which revealed the large bones of longhorn cattle (personal communication from M. Osypińska). The specimen, whose bones had been exposed by robbing, is estimated to have weighed one and a half tons. Other apparent unrobbed burials remained. Outlying and much smaller concentrations of thin, long, sharp pointed stones acted as satellites to the main ovoid enclosure, but the function of these smaller satellites remains unknown. One of the stones measured 3.23 m long; others were shorter, but nearly as impressive. These perhaps had been erected as obelisk-like dedications surrounding the main ovoid burial enclosure. Clearly, the stones used to construct the enclosure and smaller satellite features derived from rock outcrops about 100 m south of the large ovoid-shaped structure. Two extensive visits to the site recorded no pottery from the enclosure. Thus, only C^{14} analysis of the cattle bones will provide some date for this highly unusual desert architecture. The closest parallels functionally are Neolithic cattle burials seen elsewhere in Egypt and Sudan [Murray, 1926; Brass *et al.*, 2003; Brass, 2007].

The survey recorded a small mining site, complete with an oval-shaped processing area (approximately 10.8-11 m N-S x 14.8 m E-W) in Wadi Siqdit at 25° 26.484' N/34° 02.479' E: Fig. 60 & 61). Project ceramologist R.S. Tomber could not identify the pottery collected here, but it was not recognizably Ptolemaic, Roman or Islamic.

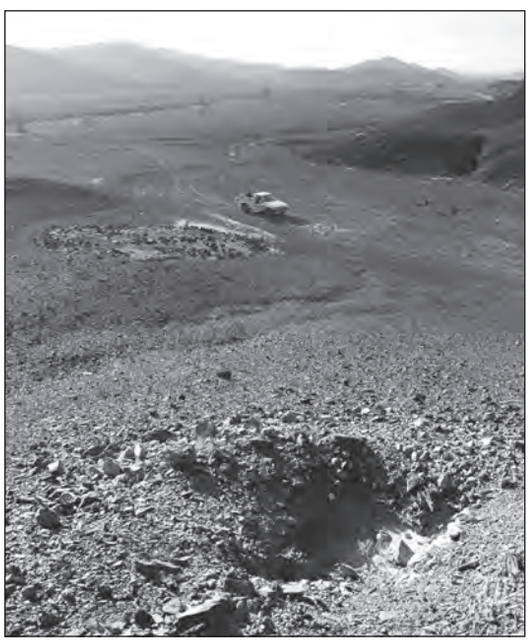


Fig. 60. Mining and working area in Wadi Siqdit. View looking south. Photo by S.E. Sidebotham.

Fig. 61. Working area near mine in Wadi Siqdit. View looking west. Photo by S.E. Sidebotham.

Conclusion

The documentation of a new ostraca archive dealing with Berenike's water supply in the early Roman period taken together with the partial excavation of a temple area in the harbor and of maritime-related artifacts including ship hull planking, ropes, etc. provides new evidence about important activities at the port. The putative dog cemetery found north of the harbor may offer new insights into the relationship some of the city's residents had with their canine companions The plethora of finds from the late Roman trash dump are evidence of small scale industrial activities in Berenike at that time and also corroborate data recovered from earlier seasons about the extensive commercial contacts Berenike had with South Asia in the later fourth, fifth and into the sixth centuries AD. Some, albeit probably quite limited, contacts between Berenike the Persian Gulf were also maintained during late Roman times. Finally, the documentation of a thriving cult dedicated to Isis and other deities in the late Roman period in the harbor area attests continued and robust religious and commercial activities in Berenike at that time.

Continued surveying in the desert hinterland indicates that many more sites remain to be identified and studied and that these are from a wide range of chronological periods.

References

Abd el-Raziq M., G. Castel et P. Tallet, 2006. Ayn Soukhna et la Mer Rouge. *Égypte, Afrique & Orient*, 41: 3-6.

Bagnall R.S., C. Helms and A.M.F.W. Verhoogt, 2000. *Documents from Berenike.* Volume I. *Greek Ostraka from the 1996-1998 Seasons* (*Papyrologica Bruxellensia* 31). Brussels: Fondation Égyptologique Reine Élisabeth.

Bagnall R.S., C. Helms, A.M.F.W. Verhoogt, A. Bülow-Jacobsen, H. Cuvigny, M. Dijkstra and U. Kaplony-Heckel, 2005. *Documents from Berenike.* Volume II. *Texts from the 1999-2001 Seasons* (*Papyrologica Bruxellensia* 33). Brussels: Fondation Égyptologique Reine Élisabeth.

Bard K.A. and R. Fattovich (eds), 2007. *Harbor of the Pharaohs to the Land of Punt. Archaeological Investigations at Mersa/Wadi Gawasis, Egypt, 2001-2005.* Naples: Università degli Studi di Napoli "L'Orientale" Dipartimento di Studi e Ricerche su Africa e Paesi Arabi. Laboratorio di Archeologia.

Brass M., 2007. Reconsidering the emergence of social complexity in early pastoral societies, 5000-2500 B.C. *Sahara*, 18: 7-22.

Brass M., A. Eyma and C. Bennett, 2003. Tracing the Origins of the Ancient Egyptian Cult. *In*: *A Delta-Man in Yebu: Occasional Volume of the Egyptologists' Electronic Forum* No. 1, p. 101-110. Parkland: Universal Publishers.

Bülow-Jacobsen A., 2008. Infra-Red Photography of Ostraca and Papyri. *Zeitschrift für Papyrologie und Epigraphik*, 165: 175-185.

Cappers R.T.J., 2006. *Roman Foodprints at Berenike. Archaeobotanical Evidence of Subsistence and Trade in the Eastern Desert of Egypt*. Los Angeles: Cotsen Institute of Archaeology.

Casson L., 1989. *The Periplus Maris Erythraei. Text with Introduction, Translation, and Commentary.* Princeton: Princeton University Press.

De Romanis F., 1996. *Cassia, cinnamomo, ossidiana. Uomini e merci tra oceano Indiano e Mediterraneo*. Rome: L'«Erma» di Bretschneider.

Dunand F., 1973. *Le Culte d'Isis dans le Bassin Oriental de la Méditerranée.* III. *Le Culte d'Isis en Asie Mineure Clergé et Rituel des Sanctuaires Isiaques.* Leiden: Brill.

Francis Jr. P., 2004. Beads and Selected Small Finds from the 1989-92 Excavations. *In*: V. Begley *et al.*, *The Ancient Port of Arikamedu. New Excavations and Researches 1989-1992.* Volume Two (*Mémoires Archéologiques* 22.2), p. 447-604. Paris: École française d'Extrême-Orient.

Frankfurter D., 1998. *Religion in Roman Egypt. Assimilation and Resistance.* Princeton: Princeton University Press.

Green N., 2006. Ostrich Eggs and Peacock Feathers: Sacred Objects as Cultural Exchange between Christianity and Islam. *Al-Masāq* 18, 1: 27-66.

Gupta S.P., S. Gupta, T. Garge, R. Pandey, A. Geetali and S. Gupta, 2004. On the Fast Track of the Periplus: Excavations at Kamrej – 2003. *Journal of Indian Ocean Archaeology* 1: 9-33.

Harrell J.A., 1998. "Geology". *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1996. Report of the 1996 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*, p. 121-148. Leiden: CNWS.

Harrell J.A., 1999. "Geology". *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1997. Report of the 1997 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations at Shenshef*, p. 107-121. Leiden: CNWS.

Herbich T.M., 2007. "Magnetic Survey". *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1999/2000. Report on the Excavations at Berenike, Including Excavations in Wadi Kalalat and Siket, and the Survey of the Mons Smaragdus Region*, p. 22-29. Los Angeles: Cotsen Institute of Archaeology.

Hill G.F., 1965. *Catalogue of the Greek Coins of Arabia, Mesopotamia and Persia (Nabataea, Arabia Provincia, S. Arabia, Mesopotamia, Babylonia, Assyria, Persia, Alexandrine Empire of the East, Persis, Elymais, Characene).* Reprint ed. Bologna: Arnaldo Forni.

Hölbl G., 2001. *A History of the Ptolemaic Empire.* London-New York: Routledge.

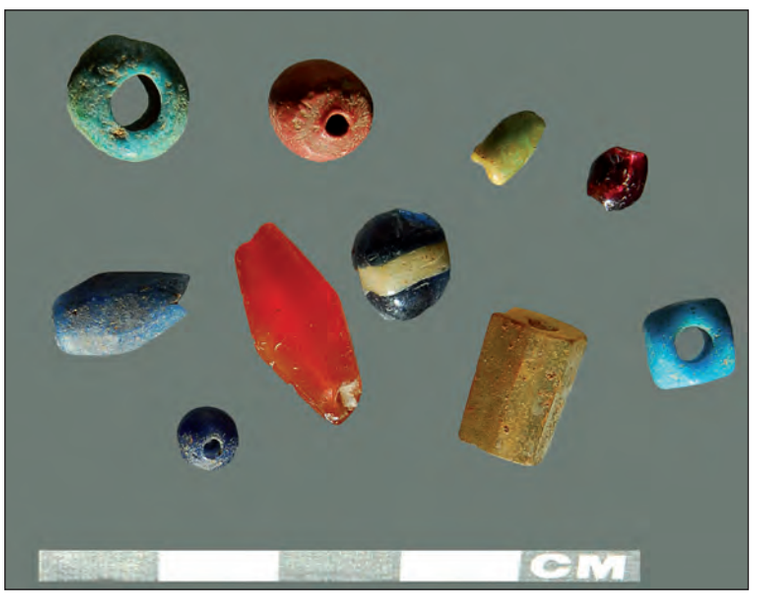
Kistler J.M., 2006. *War Elephants*. Westport, CT- London: Praeger.

McCabe E.A., 2008. *An Examination of the Isis Cult with Preliminary Exploration into New Testament Studies*. Lanham: University

Press of America.
Manniche L., 1999. *An Ancient Egyptian Herbal*. London: The British Museum Press.
Meredith D., 1957. Berenice Troglodytica. *JEA* 43: 56-70.
Munro-Hay S., 1999. *Catalogue of the Aksumite Coins in the British Museum*. London: The British Museum Press.
Munro-Hay S.C.H., 1986. *The Munro-Hay Collection of Aksumite Coins. Supplemento* n. 48, 46, 3. Naples: Istituto Universitario Orientale.
Munro-Hay S. and B. Juel-Jensen, 1995. *Aksumite Coinage*. London: Spink.
Murray G.W., 1926. Graves of Oxen in the Eastern Desert of Egypt. *Journal of Egyptian Archaeology* 12, 3-4: 248-249.
Peacock D., D. Williams and S. James, 2007. Basalt as Ships' Ballast and the Roman Incense Trade. *In*: D. Peacock and D. Williams (eds), *Food for the Gods. New Light on the Ancient Incense Trade*, p. 28-70. Oxford: Oxbow Books.
Pedersen R.K., 2000. Under the Erythraean Sea: An Ancient Shipwreck in Eritrea. *Quarterly of the Institute of Nautical Archaeology* 27, 2-3: 3-12.
Pinch G., 2002. *Handbook of Egyptian Mythology*. Santa Barbara, CA: ABC-CLIO.
Rajan K., 2008. Transoceanic Cross-Cultural Relationship between Peninsular India and Sri Lanka 5th Century BCE – 3rd Century CE, *Journal of Indian Ocean Archaeology*, 5: 24-34.
Sedov A., 2007. The Port of Qana' and the Incense Trade. *In*: D. Peacock and D. Williams (eds), *Food for the Gods. New Light on the Ancient Incense Trade*, p. 71-111. Oxford: Oxbow Books.
Sidebotham S.E., (1996) The Excavations. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1995. Preliminary Report of the 1995 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*, p. 7-97. Leiden: CNWS.
Sidebotham S.E., 1999. The Excavations. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1997. Report of the 1997 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations at Shenshef*, p. 3-94. Leiden: CNWS.
Sidebotham S.E., 2000. The Excavations. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1998. Report of the 1998 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations in Wadi Kalalat*, p. 3-147. Leiden: CNWS.
Sidebotham S.E., 2007. The Excavations. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1999/2000. Report on the Excavations at Berenike, Including Excavations in Wadi Kalalat and Siket, and the Survey of the Mons Smaragdus Region*, p. 30-165. Los Angeles: Cotsen Institute of Archaeology.
Sidebotham S.E., 2008. Archaeological Evidence for Ships and Harbor Facilities at Berenike (Red Sea Coast), Egypt. *In*: R.L. Hohlfelder (ed.), *The Maritime World of Ancient Rome. Proceedings of "The Maritime World of Ancient Rome" Conference held at the American Academy in Rome 27-29 March 2003* (*Memoirs of the American Academy in Rome* Supplementary Volume VI), p. 305-324. Ann Arbor: The University of Michigan Press.
Sidebotham S.E. and W.Z. Wendrich (eds), 1995. *Berenike 1994. Preliminary Report of the 1994 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*. Leiden: CNWS.
Sidebotham S.E. and W.Z. Wendrich (eds), 1996. *Berenike 1995. Preliminary Report of the 1995 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*. Leiden: CNWS.
Sidebotham S.E. and W.Z. Wendrich (eds), 1998a. *Berenike 1996. Report of the 1996 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*. Leiden: CNWS.
Sidebotham S.E. and W.Z. Wendrich (eds), 1998b. Berenike: Archaeological fieldwork at a Ptolemaic-Roman port on the Red Sea coast of Egypt: 1994-1998. *Sahara*, 10: 85-96.
Sidebotham S.E. and W.Z. Wendrich (eds), 1999. *Berenike 1997. Report of the 1997 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations at Shenshef*. Leiden: CNWS.
Sidebotham S.E. and W.Z. Wendrich (eds), 2000. *Berenike 1998. Report of the 1998 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations in Wadi Kalalat*. Leiden: CNWS.
Sidebotham S.E. and W.Z. Wendrich, 2001-2002. Berenike Archaeological fieldwork at a Ptolemaic-Roman port on the Red Sea coast of Egypt 1999-2001. *Sahara*, 13: 23-50.
Sidebotham S.E. and W.Z. Wendrich (eds), 2007. *Berenike 1999/2000. Report on the Excavations at Berenike, Including Excavations in Wadi Kalalat and Siket, and the Survey of the Mons Smaragdus Region*. Los Angeles: Cotsen Institute of Archaeology.
Sidebotham S.E., H. Barnard, L.A. Pintozzi and R.S. Tomber, 2005. Kab Marfu'a: An Enigmatic Settlement in Egypt's Eastern Desert. *Minerva* 16, 1 (January-February): 24-26.
Sidebotham S.E., M. Hense and H.M. Nouwens, 2008. *The Red Land. The Illustrated Archaeology of Egypt's Eastern Desert*. Cairo-New York: The American University in Cairo Press.
Sidebotham S.E. and I. Zych, 2008. Excavations at Berenike 2009. *Journal of Indian Ocean Archaeology*, 5: 107-110.
Tomber R., 2007. Rome and Mesopotamia – Importers into India in the First Millennium AD. *Antiquity*, 81: 972-988.
Tomber R.S., 2008. *Indo-Roman Trade. From Pots to Pepper*. London.
Tomber R., D. Graf and J.F. Healey, (*forthcoming*). Pots with writing. *In*: D.P.S. Peacock and L. Blue, (eds), *Quseir al-Qadim 1999-2003*. II. *The Finds*. Southampton: University of Southampton Monographs (Archaeopress).
Vermeeren C.E., 1999. Wood and Charcoal. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1997. Report of the 1997 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations at Shenshef*, p. 307-324. Leiden: CNWS.
Vermeeren C.E., 2000. Wood and Charcoal. *In*: S.E. Sidebotham and W.Z. Wendrich (eds), *Berenike 1998. Report of the 1998 Excavations at Berenike and the Survey of the Egyptian Eastern Desert, including Excavations in Wadi Kalalat*, p. 311-342. Leiden: CNWS.
Whitewright J., 2007. Roman Rigging material from the Red Sea Port of Myos Hormos. *The International Journal of Nautical Archaeology*, 36/2: 282-292.
Wild R.A., 1981. *Water in the Cultic Worship of Isis and Sarapis*. Leiden: Brill.
Wilkinson R.H., 2003. *The Complete Gods and Goddesses of Ancient Egypt*. London: Thames & Hudson.
Witt R.E., 1971. *Isis in the Graeco-Roman World*. Ithaca, NY: Cornell University Press.

***Pl.* A1. S. Sidebotham and I. Zych.**
Berenike: Archaeological fieldwork at a Ptolemaic-Roman port. Beads from late Roman trash dump trench BE10-59. Scale = 5 cm. Photo by S.E. Sidebotham.

***Pl.* A2. S. Sidebotham and I. Zych.**
Imported and Egyptian-made beads from late Roman trash dump trench BE10-59. Scale = 5 cm. Photo by S.E. Sidebotham.



***Pl.* A3. S. Sidebotham and I. Zych.**
Faience, glass and semi-precious stone beads from the late Roman trash dump trench BE10-59. Scale = 5 cm. Photo by S.E. Sidebotham.

***Pl.* A4. S. Sidebotham and I. Zych.**
Eastern Desert Ware from late Roman trash dump trench BE10-59. Scale = 5 cm.
Photo by S.E. Sidebotham.

***Pl.* A5. S. Sidebotham and I. Zych.**
Millefiore glass fragments. Scale = 5 cm.
Photo by S.E. Sidebotham.

***Pl.* A6. S. Sidebotham and I. Zych.**
Finger ring gemstone depicting winged and seated sphinx.
Photo by S.E. Sidebotham.

***Pl.* A7. S. Sidebotham and I. Zych.**
Bronze *patera*/*phiale* with traces of iron tripod attached (after conservation) from the harbor temple. Scale = 5 cm.
Photo by S.E. Sidebotham.