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The Ptolemaic to Early Roman Amethyst Quarry at Abu Diyeiba in Egypt's Eastern Desert

JAMES A. HARRELL, STEVEN E. SIDEBOTHAM, ROGER S. BAGNALL, SYLVIE MARCHAND, JENNIFER E. GATES, JEAN-LOUIS RIVARD

In June 2004 two of the authors (JAH and SES) conducted a survey of an ancient amethyst quarry near Wadi Abu Diyeiba, about 25 km southwest of Safaga (fig. 1).[1] This is one of only two known quarries for this gemstone in Egypt. Amethyst is the purple-colored, transparent to translucent variety of the mineral quartz (SiO_2). Amethystine quartz, as it is also commonly called, was used in ancient Egypt from late Predynastic times onward, mostly for jewelry, especially beads and amulets, and occasionally for small vessels.[2] Its use peaked in popularity during the Middle Kingdom and again, to a lesser extent, during the Roman period.

Amethyst was known as *hesmen* to Egyptians of the Middle Kingdom,[3] but the modern name for this gemstone comes from the ancient Greek *amethystos*, meaning "without drunkenness".[4] It was believed that wearing amethyst provided either protection from or a remedy for intoxication by wine. The fact that the gemstone has the color of wine is clearly related to this belief, but where the idea that it was an anti-intoxicant came from is unknown. The earliest surviving classical Greco-Roman reference to *amethystos* comes from the Greek scholar Theophrastus, in his late fourth century BC treatise *On Stones* (30-31), where he describes

1 J.A. Harrell, S.E. Sidebotham, "Wadi Abu Diyeiba – an Amethyst Quarry in Egypt's Eastern Desert", *Minerva* 15/6, 2004, p. 12-14. Also assisting with the fieldwork were geologist Mohammad Madbouly, of the Egyptian Geological Survey and Mining Authority, and general helpers Ahmad Badawy and Rida ("Hamam") Sayed Hassan.

2 C. Andrews, *Ancient Egyptian Jewelry*, New York, 1990, p. 40; T. De Putter, Chr. Karlshausen, *Les pierres utilisées dans la sculpture et l'architecture de l'Égypte pharaonique – Guide pratique illustré,* Bruxelles, 1992, p. 128-129; B.G. Aston, J.A. Harrell, I. Shaw, "Stones", in P. T. Nicholson, I. Shaw (eds.), *Ancient Egyptian Materials and Technology*, Cambridge, 2000, p. 50-52.

3 J.R. Harris, *Lexicographical Studies in Ancient Egyptian Minerals*, Berlin, 1961, p. 121-122.

4 H.G. Liddell, R. Scott, *A Greek-English Lexicon*, Oxford, 1996, p. 79; R.S. Mitchell, *Mineral Names – What Do They Mean*, New York, 1979, p. 85.

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it as "wine-colored". The Roman writer Pliny the Elder, in his mid to late first century AD encyclopedic *Natural History* (37.121), says *amethystos* came from Egypt, among other places, and derives its name from the color of wine.

In the late fourth century AD, Epiphanius, bishop of Salamis in Cyprus, authored a work with the abbreviated title, in its Latin translation, of *De Gemmis*. In it Epiphanius refers to the gem amethyst and mentions that it is found near the sea in the Libyan mountains.[5] He makes no mention of Egypt where all the archaeological evidence to date suggests that ancient mining of amethysts ceased by early Roman times. Perhaps his Libyan mountains near the sea can be equated with Egypt's Red Sea Mountains of the Eastern Desert, but, of course, this cannot be proven.

The best known of Egypt's ancient amethyst quarries is the one near Wadi el-Hudi, about 25 km southeast of Aswan (fig. 1). It dates to the Middle Kingdom and consists of three well-separated quarry pits, each with its own fortified settlement.[6] It has been suggested, based on a preliminary pottery analysis, that the southernmost of these sites was also worked during the Roman period.[7] Even if true, such activity must have been minor both because the quality and quantity of amethyst there is low, and because the pit is small, measuring only 10 by 25 m in area with a depth of 2-3 m.

It is commonly reported in the Egyptological literature that there is another amethyst quarry dating to the Middle Kingdom, and also possibly the Old Kingdom and Roman period, at Stela Ridge near Gebel el-Asr, 70 km northwest of Abu Simbel (fig. 1). This, however, is incorrect as Stela Ridge produced only carnelian and other colored varieties of chalcedony (i.e., fibrous, microcrystalline, translucent to opaque quartz; also referred to as chalcedonic quartz).[8] The error originated with R. Engelbach,[9] who reported finding pieces of amethyst within a stone cairn of Middle Kingdom date and suggested that this gemstone may have been one of the products of the Stela Ridge quarry. If Engelbach's identification of amethyst is correct, and it is not just the purple chalcedony at Stela Ridge that he saw, then it is likely that the amethyst was brought from the contemporaneous Wadi el-Hudi quarry.

The amethyst quarry near Wadi Abu Diyeiba was discovered by G. B. Crookston in 1914 and first reported by G. W. Murray in the same year.[10] Murray provided the following brief description in his half-page note: "The workings are very extensive and the amethysts occur lining cavities in a drusy red granite…[where] these cavities occur along veins in the granite,

5 R.P. Blake, H. De Vis, *Epiphanius De Gemmis. The Old Georgian Version and the Fragments of the Armenian Version and the Coptic-Sahidic Fragments*, London, 1934, p. 151, 222-223, 288-289.

6 A.E. Rowe, "Three New Stelae from the South-Eastern Desert", *ASAE* 39, 1939, p. 187-191; A. Fakhry, *The Inscriptions of the Amethyst Quarries at Wadi el-Hudi*, Cairo, 1952; A.I. Sadek, *The Amethyst Mining Inscriptions of Wadi el-Hudi* (2 vols), Warminster, 1980-1985; I. Shaw, R. Jameson, "Amethyst Mining in the Eastern Desert – a Preliminary Survey at Wadi El-Hudi", *JEA* 79, 1993, p. 81-97; R. Klemm, D.D. Klemm, A. Murr, "Geo-archäologischer survey im Wadi el-Hudi", in A. Eggebrecht (ed.), *Festschrift Arne Eggebrecht zum 65. Geburtstag am 12 März 2000*, Hildesheim, 2002, p. 53-66.

7 I. Shaw, R. Jameson, *op. cit.*, p. 86.

8 J.A. Harrell, E.G. Bloxam, "Stela Ridge Carnelian Mine, Nubian Desert", *Program and Abstracts, the 55th Annual Meeting of the American Research Center in Egypt, April 16-18, 2004, Tucson, Arizona*, p. 52.

9 R. Engelbach, "The Quarries of the Western Nubian Desert: a Preliminary Report", *ASAE* 33, 1933, p. 69.

10 G.W. Murray, "Notes", *Cairo Scientific Journal* 8, 1914, p. 179.

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which run in remarkably straight lines for hundreds of yards." The next recorded visit to the quarry was by L. A. Tregenza.[11] He only commented on the ruins of the main quarry settlement, which he said consisted "perhaps of ten rooms", and there he also reported finding "fragments of three Greek inscriptions on slabs of sandstone…[and, on the adjacent ridge top] many outlines of men's feet on its sandstone platform." D. Meredith[12] noted this discovery before Tregenza reported it himself, and subsequently published transcriptions of the Greek texts.[13] Meredith also provided the first map showing the location of the amethyst quarry[14] and later supplied a much-improved map of the Abu Diyeiba region.[15]

Unreported in the earlier studies of the Abu Diyeiba quarry, and consequently constituting the objectives of the present study, are: (1) the geologic origins of the amethyst deposits; (2) the geographic distribution and nature of the quarry workings; and (3) descriptions of the main settlement, and other ruins and archaeological remains within the quarry. The present study entailed mapping surveys of the surface remains; no excavations were undertaken. Artifacts found on the surface were photographed for later analysis by three other co-authors (Greek texts by RSB, pottery by SM, and anepigraphic pictorial stelae and other carved objects by JEG and SES) with architectural plans of the ruins prepared by the sixth co-author (J-LR) from 'total-station' survey data provided by SES.

REGIONAL ARCHAEOLOGY

There are eight archaeological sites within a 20 km radius of the Abu Diyeiba quarry (fig. 2). About 19 km to the southwest in Wadi Umm Wikala, a tributary of Wadi Semna, there is the well known early Roman (first and second centuries AD) quarry for gabbro, the Roman *lapis ophi(a)tes* (at 26° 25.85' N, 33° 39.7' E).[16] Also to the southwest, about 6 km from Abu Diyeiba, in an unnamed tributary of Wadi Safaga at a site sometimes referred to as Bir Waseef, there are the remains of a large late Roman-era settlement (likely fifth century AD based on the pottery) of approximately 120 small structures of uncertain purpose (at 26° 30.31' N, 33° 45.67' E).[17] These

11 L.A. Tregenza, *Egyptian Years*, Oxford, 1958, p. 178-180.

12 D. Meredith, "The Roman Remains in the Eastern Desert of Egypt (Part II)", *JEA* 39, 1953, p. 102.

13 D. Meredith, "Inscriptions from Amethyst Mines at Abu Diyeiba (Eastern Desert of Egypt)", *EOS Comentarii Societatis Philologae Polonorum* 48/2, 1957, p. 117-119.

14 *Ibid.*, fig. 1.

15 D. Meredith, *Tabula Imperii Romani, Sheet N G 36 Coptos*, Oxford, 1958, fig. 4.

16 F. Bisson de La Roque, "Voyage au Djebel Shaib", *BSRGE* 11, 1922, p. 134; G.W. Murray, "The Roman Roads and Stations in the Eastern Desert of Egypt", *JEA* 11, 1925, p. 146; D. Meredith, "The Roman Remains in the Eastern Desert of Egypt (Part I)", *JEA* 38, 1952, p. 106; L.A. Tregenza, *op. cit.*, p. 155-174; S.E. Sidebotham, S.E. Barnard, J.A. Harrell, R.S. Tomber, "The Roman Quarry and Installations in Wadi Umm Wikala and Wadi Semna", *JEA* 87, 2001, p. 135-170.

17 F. Bisson de La Roque, *op. cit.*, p. 132-133; G.W. Murray, *op. cit.*, p. 146; PM VII, p. 338; D. Meredith, *JEA* 39, 1953, p. 102-103; L.A. Tregenza, *op. cit.*, p. 177-178; A. Bernand, *Pan du désert*, Leiden, 1977, p. 140 (where he believes the adjacent settlement to be a mining community, for which there is no archaeological evidence whatsoever); cf. S.E. Sidebotham, H. Barnard, G. Pyke, "Five Enigmatic Late Roman Settlements in the Eastern Desert", *JEA* 88, 2002, p. 187-225 for similar types of sites.

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remains may represent an early Christian community similar to ones investigated elsewhere in the Eastern Desert by one of the present authors (SES).[18] Adjacent to the Bir Waseef site are two rock-cut inscriptions: one, written in hieroglyphics, bears the cartouche of the 27th Dynasty Achaemenid Persian king Darius I (reigned 521-486 BC), and the other, written in Greek, is apparently of Ptolemaic age (at 26° 30.34' N, 33° 45.65' E). In Wadi Safaga there are two unstudied sites of Roman date associated with gold mining. The first is 15 km northwest of Abu Diyeiba at the mouth of Wadi Abu Muraywat (at 26° 35.20' N, 33° 41.30' E), and the second one, which is at the mouth of Wadi Umm Jariyan 8 km northwest of the amethyst quarry (at 26° 34.30' N, 33° 45.70' E), also has a cemetery with about 27 graves (at 26° 34.35' N, 33° 45.77' E).

At the mouth of Wadi Safaga, just inland from the coast and 19 km northeast of Abu Diyeiba, there is a Roman *praesidium* (at 26° 37.05' N, 33° 58.55' E)[19] that was a station on the *Via Nova Hadriana.* The *Via Nova Hadriana* is the only attested ancient road in the region, and it extended for about 800 km from Antinoopolis on the east bank of the Nile in Middle Egypt to Berenike on Egypt's southern Red Sea coast. Built in the early second century AD, this thoroughfare seems to largely post-date activities at the Abu Diyeiba quarry. It would have followed, however, earlier roads in the region that were in use when the quarry was active.[20] About 10 km southwest of the *praesidium* (and 9 km northeast of Abu Diyeiba), in Wadi Umm Howeitat, there is a large settlement that may have been a fifth century AD Christian *laura* community (centered at 26° 33.29' N, 33° 54.38' E).[21] A little further to the south, about 15 km northeast of Abu Diyeiba, in Wadi Gasus, there is a settlement dating to the 12th and 26th Dynasties (at approximately 26° 33.00' N, 33° 58.50' E) that is associated with a lead mine in the hills just to the south.[22]

At the mouth of Wadi Gawasis, 20 km east of Abu Diyeiba, there is a Middle to early New Kingdom port settlement that was initially excavated in the 1970's and is currently undergoing excavation (26° 33.37' N, 34° 02.00' E).[23] Still to be located, but almost certainly on the

18 Sidebotham, Barnard, Pyke, *op. cit.*; S.E. Sidebotham, H.M. Nouwens, A.M. Hense, J.A. Harrell, "Preliminary Report on Archaeological Fieldwork at Sikait (Eastern Desert of Egypt), and environs: 2002-2003", *Sahara* 15, 2004, p. 23, pl. G.

19 L.A. Tregenza, *op. cit.*, p. 184; S.E. Sidebotham, R.E. Zitterkopf, "Survey of the Via Hadriana: the 1997 Season", *BIFAO* 98, 1998, p. 353-365, table 1.

20 S.E. Sidebotham and R.E. Zitterkopf, "Survey of the Via Hadriana by the University of Delaware: the 1996 Season", *BIFAO* 97, 1997, p. 221-237; Sidebotham, Zitterkopf, *BIFAO* 98, 1998, p. 353-365; S.E. Sidebotham, R.E. Zitterkopf, C.C. Helms, "Survey of the Via Hadriana: The 1998 Season", *JARCE* 37, 2000, p. 115-127; S.E. Sidebotham, R.E. Zitterkopf, "Surveying the Via Nova Hadriana: The Emperor Hadrian's Desert Highway in Egypt", *Minerva* 17/3, 2006, p. 15-16. A final report on the Via Nova Hadriana is now in preparation.

21 S.E. Sidebotham, H. Barnard, G. Pyke, *op. cit.*, table 1.

22 J.G. Wilkinson, *Modern Egypt and Thebes* (Vol. II), London, 1843, p. 385; G. Schweinfurth, *Alte baureste und hieroglyphische inschriften im Uadi Gasūs*, Berlin, 1885, p. 10-11; PM VII, p. 338-339; D. Meredith, *JEA* 39, 1953, p. 101-102; L.A. Tregenza, *op. cit.*, p. 180-181.

23 A.M.A.H. Sayed, "Discovery of the Site of the 12th Dynasty Port at Wadi Gawasis on the Red Sea Shore", *RdE* 29, 1977, p. 138-178; *id.*, "New Light on the Recently Discovered Port on the Red Sea Shore", *CdE* 58, 1983, p. 23-37; *id.*, *The Red Sea and its Hinterland in Antiquity. A Collection of Papers Published in the Arabic and European Periodicals*, Alexandria, 1993, *passim*; H. Frost, "Ports, Cairns and Anchors. A Pharaonic Outlet on the Red Sea", *Topoi* 6/2, 1996, p. 869-902; A.M.A.H. Sayed, "Wadi Gasus", in K.A. Bard, S.B. Shubert (eds.), *Encyclopedia of the Archaeology of Ancient Egypt*, London, New York, 1999, p. 866-868; K. Bard, R. Fattovich, "Recent Excavations at a Middle Kingdom port on the Red Sea (Wadi Gawasis)", *Program and Abstracts, the 56th Annual Meeting of the American Research Center in Egypt, April 22-24, 2005, Cambridge, Massachusetts*, p. 28.

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stretch of Red Sea coast east of Abu Diyeiba, is the Ptolemaic port of *Philoteras*.[24] Although commonly asserted, it is not yet demonstrated that this port is coincident with the one in Wadi Gawasis where no Ptolemaic remains have so far been found.

LOCAL TOPOGRAPHY AND GEOLOGY

G.W. Murray[25] named the amethyst quarry after nearby Wadi Abu Diyeiba (Valley of the Jackals; figs. 2-3).[26] This sobriquet is misleading, however, because only the eastern edge of the quarry falls within Wadi Abu Diyeiba's drainage basin and none of it extends into the wadi itself. Adding to the geographic confusion, on a recent topographic map of the area this valley is labeled Wadi Abu Dirah (Valley of Grinding Stones).[27] Most of the amethyst quarry drains into a previously unnamed valley, which the authors have christened Wadi el-Gamasht (Valley of Amethyst). This is a tributary of Wadi Waseef, which, like Wadi Abu Diyeiba, flows into Wadi Safaga to the north and thence eastward to the Red Sea. The only access to the quarry is through Wadi el-Gamasht, which has a broad, flat sandy floor. On the summit of the high hill at the mouth of this wadi there are the remains of six ancient stone cairns that are up to 0.75 m high and 1.5 m in diameter (C1 in fig. 3). Although small, they are easily seen by visitors approaching the quarry from Wadi Waseef (fig. 4). There is no access to the quarry through Wadi Abu Diyeiba, which is impassable in the mountainous area to the northeast. Here it is reduced to a narrow, boulder-filled defile that is cut by occasional vertical drop-offs of up to several meters in height.

Amethyst quarrying occurred in a pink-colored, medium-grained (i.e., crystals mostly 1-5 mm across) granite of Late Proterozoic age (between 530 and 620 million years old), which is variously identified on geologic maps as a 'post-tectonic', 'late orogenic', 'younger', 'pink or red', or 'calc-alkaline' granite or granotoid.[28] This rock is deeply weathered and erodes more rapidly than the surrounding rocks, and so is characterized by an open terrain of low relief

24 Mentioned by Strabo (*Geography* 16.4.5), Pomponius Mela (*De Chorographia* 3.80), Pliny the Elder (*Natural History* 6.168) and Claudius Ptolemy (Geography 4.5.8); see H. Kees, "Philoteras", in G. Wissowa (ed.), *Paulys Realencyclopädie der classischen Altertumswissenschaften neununddreissigster Halbband*, Stuttgart, 1941, col. 180-181; G.W. Murray, *JEA* 11, 1925, p. 142; J. Ball, *Egypt in the Classical Geographers,* Cairo, 1942, p. 183-185; P.M. Fraser, *Ptolemaic Alexandria* (vol. 1), pp. 177-178, note 348/354.

25 G.W. Murray, *op. cit.*, p. 146.

26 The topography in fig. 2 was taken from *Al-Qusayr* (1:250,000; Sheet NG 36 K), Egyptian General Survey Authority, 1996, Cairo. The topography in figure 3 was compiled from two maps and a satellite photograph: *Safaja* (1:50,000; Sheet NG 36 K5b), Egyptian General Survey Authority, 1989, Cairo; *Jabal Abu Aqarib* (1:50,000; Sheet NG 36 K2d), Egyptian General Survey Authority, 1989, Cairo; and Corona satellite photograph D090-096-M29JUL69-1107-1AFT available from the U. S. Geological Survey.

27 *Safaja*, *ibid.*

28 *Geologic Map of the Qena Quadrangle, Egypt* (1:500,000), Egyptian Geological Survey and Mining Authority, Cairo, 1978; *Basement Rocks of the Safajah Quadrangle, Egypt* (1:100,000; Sheet NG 36 K5-6), Egyptian Geological Survey and Mining Authority, Cairo, 1987; *Geologic Map of Al Qusayr Quadrangle, Egypt* (1:250,000; Sheet NG 36 K), Egyptian Geological Survey and Mining Authority, Cairo, 1992; *Geological Map of Egypt* (1:500,000; Sheet NG 36 NE Quseir), Egyptian General Petroleum Corporation and Conoco Coral, Cairo, 1987; S. El Gaby, F.K. List, R. Tehrani, "The Basement Complex of the Eastern Desert and Sinai", in R. Said (ed.), *The Geology of Egypt*, Rotterdam, 1990, p. 180-181; M.A. Hassan, A.H. Hashad, "Precambrian of Egypt", *ibid.*, p. 237-242.

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across much of its outcrop. The higher hills immediately to the north, east and south of the quarry are largely composed of dark gray to black volcanic rocks of rhyolitic to mainly andesitic composition that belong to the Dokhan Volcanics. These are roughly the same geologic age as the granite,[29] but in the Abu Diyeiba area are slightly older as indicated by inclusions of volcanic rocks within the granite near its intrusive contact with the Dokhan Volcanics. The hills on the west side of the quarry are mostly capped by sandstone belonging to the much younger (Late Cretaceous; 65 to 85 million years old) Taref Formation of the Nubia Group, or what is commonly referred to simply as the Nubia Sandstone.[30] Also of Late Cretaceous age, and a little further to the west, are the phosphate beds of the Duwi Formation , which was mined for phosphate up until a few decades ago.[31] The ruins that now litter Wadi Waseef are the last vestiges of this now defunct industry.

The granite is riddled with extensional (pull-apart) fractures produced when the Red Sea rift basin began to open about 25 million years ago.[32] These open fractures are sub-parallel to the northwest to southeast-oriented rift axis, which has a bearing of N 25° to 30° W. Hydrothermal solutions circulated through the fractures and over time filled them with secondary quartz. These deposits consist mostly of massive milky quartz veins, but in places open cavities were preserved and these were lined with crystals of both amethystine quartz and colorless quartz (*i.e.*, rock crystal). The only difference between these two quartz varieties is the presence of iron impurities within the former, which are the source of amethyst's distinctive purple color.[33]

QUARRY WORKINGS

The Abu Diyeiba quarry consists of between 400 and 500 trenches scattered across an area of nearly 3 km² with most of these in the southern half of the quarry (figs 3, 5-6). In terms of both volume of rock removed and areal extent of the workings, the Abu Diyeiba quarry is many times larger than the one in Wadi el-Hudi. Individual trenches are up to 100 m long (not "hundreds of yards" as G. W. Murray asserted), 20 m deep and 3 m wide, but the vast majority of these excavations have much smaller dimensions and are generally less than a few tens of meters long, 1 m wide and 2 m deep. It is the quartz-filled fractures in the granite that the quarry trenches follow. A striking aspect of these excavations is that they are roughly parallel to each other in any given area. They range in orientation between N 50° W and N 15° E with most N 10° to 30° W and roughly coincident with the axis of the Red Sea basin.

29 S. El Gaby, F.K. List, R. Tehrani, *op. cit.*, p. 181-182; M.A. Hassan, A.H. Hashad, *op. cit.*, p. 225-226.

30 E. Tawadros, *Geology of Egypt and Libya*, Rotterdam, 2001, p. 108-109.

31 A.A.A. Hussein, "Mineral Deposits", in R. Said (ed.), *The Geology of Egypt*, Rotterdam, 1990, p. 553-554.

32 P. Morgon, "Egypt in the Framework of Global Tectonics", in R. Said (ed.), *The Geology of Egypt*, Rotterdam, 1990, p. 104-109.

33 G.R. Rossman, "Colored Varieties of the Silica Minerals", in P.J. Heaney, C.T. Prewitt, G.V. Gibbs (eds.), *Silica – Physical Behavior, Geochemistry and Materials Applications*, *Reviews in Mineralogy* 29, 1994, p. 442-447.

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On the granite walls of the trenches one occasionally sees small cavities lined with colorless quartz crystals. Although no amethyst was observed within these cavities, fragments of amethyst crystals can be found on the spoil piles adjacent to the trenches. These almost always have a pale, non-uniform purplish color and may represent low-quality material discarded by the quarrymen. Some of the paleness, however, must also stem from amethyst's tendency to fade upon prolonged exposure to sunlight.[34] The occurrence of rock crystal at Abu Diyeiba suggests that this gemstone may have also been a product of the quarry.

No tools or tool marks were found within the quarry. Given the Ptolemaic-Roman age of the workings (see below), it is very likely that the tools used were hammers, chisels and picks fashioned from iron. The metal, of course, was a valuable commodity and so the tools, including the broken fragments, would have been taken away by the quarrymen when the site was abandoned. Any iron left behind on the surface would have been scavenged by the local nomads, the forerunners of today's Bedouin. Excavation of the spoil piles and a more systematic examination of the trench walls may yet turn up pieces of iron tools and the marks they left.

There is evidence of modern activity in only one part of the quarry. This is site M in figure 3 (at 26° 31.55' N, 33° 49.90' E). Here the spoil piles are lighter colored than those elsewhere in the quarry, which have acquired a darker desert varnish. Site M also has the only trench in the quarry with an underground (subterranean) extension. This adit penetrates a few meters into the granite from the bottom of a 4.5 m-deep trench. About 150 m to the southeast, a scatter of modern pottery sherds (white glazed porcelain) and bottle glass fragments may be related to this recent activity. There is no record of the Abu Diyeiba quarry being reopened in modern times, but certainly, in recent decades, it has been visited by looters who almost completely dismantled the buildings in the main settlement and dug numerous and, in many cases, large robber pits in and around these structures. It seems likely that both the looting and the quarrying at site M are associated with phosphate mining that occurred in the hills along the west side of Wadi Waseef beginning in 1910.[35]

Apart from the remains of a few stone huts and tombs, which are discussed below, the only other feature of note among the quarry workings is an enigmatic line of stones at site L (26° 30.64' N, 33° 50.21' E; fig. 7). This is a 40 m-long, nearly straight line of cobble-sized stones running up the foot of a high hill. At first glance one would be tempted to see it as marking the location of a future quarry trench. This, however, cannot be the case because the line is not associated with a quartz-filled fracture, and also it crosses both granite and volcanic rock, which lacks the quartz deposits. The purpose of the stone line is unknown, and perhaps it is something later and unrelated to amethyst quarrying.

34 *Ibid.*, p. 446.
35 A.A.A. Hussein, *op. cit.*, p. 553-554.

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RUINS OF BUILDINGS

1. Main Settlement

About 0.5 km southeast of the hilltop cairns marking the entrance to Wadi el-Gamasht, in a deep swale between two low sandstone hills, is the quarry's main settlement. Unfortunately, it has been largely destroyed by robbers looking for saleable antiquities and only fragments of walls remain from the approximately ten to twelve buildings (figs 8-10; at 26° 31.07' N, 33° 49.45' E). The adjacent hills immediately north of the settlement have a scattering of low cairns and on a hill to the south there is another ruined structure. Numerous and substantial modern robber pits cut through the floors of the structures in the main settlement as well as the ground around them. The edifices here were made from unshaped, variously sized, dry-laid pieces of the local sandstone and have maximum extant wall heights in the 1.55-1.80 m range. Found among these ruins by the survey were fragments of six different Greek inscriptions, one of which is nearly complete, carved into sandstone slabs (see below). Also recovered were numerous fragments of, when assembled, an almost complete anepigraphic sandstone stela, a portion of another sandstone stela, and sandstone blocks carved in the form of an altar and the outline of an offering table (see below).

Inscribed into the sandstone outcrops and on loose stone slabs on the east side of the main settlement are representations of scores of human feet (figs 11-12). Close parallels for the feet can be found throughout Egypt from the Old Kingdom to Roman times. In the Greco-Roman period these feet are sometimes associated with the goddess Isis,[36] and so these may have been offerings by dedicants.[37] Similar carved feet occur in Wadi Quseir al-Qadim between Myos Hormos and Nakheil,[38] and at sites in the Kingdom of Meroë, Nubia and the Western Desert.[39] The several dozen representations of carved human feet at Abu Dieyiba appearing on the large flat sandstone outcrop at the top of the site vary in length from 19-32 cm with the average being 26-27 cm long. Widths vary from 7-8 cm at the heels to 10 cm at the toes. Similar carved feet also appear in secular contexts as symbols of good luck and good fortune in both the Roman and Byzantine periods.[40] These feet are sometimes accompanied by 'hash' marks or 'pilgrim' gouges (elongated abrasions produced by deliberate rubbing), which also occur alone as well. The same kind of hash marks can be seen in profusion at numerous temples in the Nile valley,[41]

36 K.M.D. Dunbabin, "*Ipsa deae vestigia*…Footprints Divine and Human on Graeco-Roman Monuments", *JRA* 3, 1990, p. 85-109; L. Castiglione, "Tables votives à empreintes de pied dans les temples d'Égypte", *Acta Orientalia* 20, 1967, p. 239-252.

37 Dunbabin, *op. cit.*, p. 85-86, 107; O.E. Kaper, H. Willems, M.M.A. Mcdonald, "Policing the Desert. Old Kingdom Activity around the Dakhleh Oasis", in R. Friedman (ed.), *Egypt and Nubia Gifts of the Desert*, London, 2002, p. 85-86, figs. 4-6.

38 W. Van Rengen, D. Peacock, D. Murphy, J. Whitewright, "Rock Art and Inscriptions", in D. Peacock, L. Blue (eds.), *Myos Hormos – Quseir al-Qadim Roman and Islamic Ports on the Red Sea.* Volume 1: *Survey and Excavations 1999-2003*, Oxford, 2006, p. 19-21, figs. 2.16, 2.20 and 2.23.

39 P. Wilson, "2. Foot Outlines and Inscriptions", in P. Rose (ed.), *Qasr Ibrim. The Hinterland Survey,* London, 1996, p. 102-110, figs. 3.2-3.7, 3.13-3.42, 5.2 (nos. 14 & 16), 5.23; Kaper, Willems, Mcdonald, *op. cit.*, p. 85-86, figs. 5-6.

40 Dunbabin, *op. cit.*, p. 96-107; M. Verner, *Some Nubia Petroglyphs on Czechoslovak Concessions (Acta Universitatis Carolinae Philologica Monographia* XLV), Prague, 1973, p. 13-53 and plates.

41 Rose, *op.cit.*, fig. 5.22; D. Frankfurter, *Religion in Roman Egypt: Assimilation and Resistance*, Princeton, 1998, p. 51-52, pl. 21.

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where they are thought to have been left by religious pilgrims and supplicants. Similar hash marks also appear in Wadi Quseir al-Qadim.[42] The feet and hash marks at Abu Diyeiba were undoubtedly associated with the religious cult activities amply attested here by the inscriptions dedicated to the deities Pan, Apollo, Serapis and Harpocrates during the reigns of Ptolemy VI and his wife Cleopatra II (175-145 BC), and perhaps other Ptolemaic monarchs or possibly even during the early Roman era. Equally enigmatic is a cross just west of the main settlement (fig. 13 and the + on the map in fig. 3). This was made from two intersecting double lines of stones laid out on the ground with, respectively, due north-south and due east-west orientations. Measuring 5.4 m N-S by 4.8 m E-W, the cross appears to be an ancient construction (and almost certainly pre-Christian), but its purpose remains unknown.

The association of so many religious texts and artifacts with the relatively few buildings at Abu Diyeiba suggests that the main settlement likely accommodated administrative officials; this area also appears to have had some religious significance based on the inscriptions and other artifacts recovered here. The ancient workforce, probably never very large (less than 100 individuals), may have lived in tents scattered around the work areas. Wells, probably in the wadis, but now buried under sediment, would have provided water and most food was likely imported from the Nile valley, although the presence of sea shells suggests consumption of some items from the Red Sea.

The huge extent of the amethyst workings at Wadi Abu Diyeiba surely indicates that the site saw centuries of activity. One would expect, therefore, that there would be numerous burials but, apart from two plundered cairn tombs (T1 in figure 3) on the east side of the quarry, and one other sepulcher (T2 in figure 3) that appears intact but empty, none were found. T1 has two badly plundered tombs that originally had circular boulder caps 1.5 to 2.0 m in diameter. Pieces of human bone litter the surface, but no traces of grave goods were seen. T2 is an entirely different kind of structure. It is an above-ground chamber with walls and a roof of stacked stone. This tomb is still intact, but there is a small opening on one side and peering through this it appears that the interior is empty.

This dearth of extant graves may suggest the very seasonal nature of the quarrying operations or it may indicate that many of the dead were returned to the Nile valley for burial. Several papyri attest the custom of returning the deceased to their homes for burial.[43] There is a reference to tolls charged on dead bodies transiting the Eastern Desert roads in the famous Coptos Tariff of 90 AD,[44] and we must assume that the dead were carried from the Eastern Desert and Red Sea coast to the Nile and not vice versa!

42 Van Rengen, Peacock, Murphy, Whitewright, *op. cit.,* p. 20, fig. 2.19.

43 Cf. S. Walker, *Mummy Portraits from Roman Egypt*, New York, 2000, p. 157-159 (no. 115) and related bibliography.

44 *OGIS* 674 = *IGRR* I.1183 = A. Bernand, *Les portes du désert*, Paris, 1984, p. 199-208 (no. 67); S.E. Sidebotham, *Roman Economic Policy in the Erythra Thalassa 30 B.C.-A.D. 217*, Leiden, 1986, p. 35, 53, 67, 80-81; G.K. Young, *Rome's Eastern Trade. International Commerce and Imperial Policy 31 BC-AD 395,* London, New York, 2001, p. 48-50 with translation; cf. F. Burkhalter-Arce, "Le 'Tarif de Coptos'. La douane de Coptos, les fermiers de l'*apostolion* et le préfet de désert de Bérénice", *Topoi Suppl.* 3, 2002, p. 199-233; H. Cuvigny, "La société civile des *praesidia*", in *id.* (ed.), *La route de Myos Hormos. L'armée romaine dans le désert Oriental d'Égypte. Praesidia du désert de Bérénice* I (vol. 2), Cairo, 2003, p. 374.

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2. Satellite Settlement

Nearly 1 km southeast of the main building area is a smaller satellite settlement with several crude low stone walls around three large granite boulders (figs 14-16; at 26° 30.85' N, 33° 49.91' E). The diminutive height of these walls suggests that they may have served as bases for tents, windbreaks or other impermanent structures. Boulder "A" has an L-shaped wall abutting it that measures 2.8 × 1.2 m. Boulder "B" has the highest and best-built walls, and these form two rectangular rooms, one measuring 7.8 × 2.1 × 1.8 m with a bench or sleeping platform inside, and the other, which shares a 1.8 m wall with the first, measuring 2.8 × 4.0 m (fig. 15). In places the original maximum wall height of 1.0 m is preserved. A third room or 'courtyard' with a low wall on three sides encloses a roughly square area of about 3.0 m on a side adjoining the entrance to the second room. Boulder "C" has abutting walls forming three sub-rectangular rooms measuring 3.3 × 2.0 m, 2.1 × 1.6 m and 3.3 × 2.7 m with some of the walls still standing at their original maximum height of 60 cm. The settlement is bisected by a quarry trench that ends at boulder "A".

3. Small Temple

A little farther south and to the west in Wadi el-Gamasht (at 26° 30.25' N, 33° 49.81' E) is a well-preserved temple or shrine (figs 17-19). This small structure, which is built of locally available granite and faces northeast, consists of a single room roofed by two large flat rock slabs. With its small interior (1.30 m high, 1.15 m wide, and 1.50 m deep), the roofed room could not have accommodated a person performing rituals. No epigraphic remains were recovered here, but perhaps this space held a cult image that has long since disappeared. Surrounding the room is a stone wall, perhaps designed as a *temenos*, which transforms into a small processional entrance-way over 6m long, but only 70-80 cm wide. This leads to the edge of the Wadi where there are scant remains of what may have once been a staircase.

This rather small, enigmatic structure has several parallels found at other Ptolemaic and early Roman sites in the Eastern Desert. One of these is the gold mining settlement at Bokari (25° 15.20' N, 33° 45.30' E), where a shrine is perched above a wadi on the side of a low granite hill. This edifice has a single room 1.0 × 1.5 m in area with a height of 1.0-1.5 m and is roofed with two slabs of stone.[45] Like the one at Abu Diyeiba, this shrine also stands apart from the main settlement. The small quarry at Fatira al-Beida (26° 44.09' N, 33° 19.44' E)[46] southwest of the main quarry at Mons Claudianus also has a diminutive, single-room, roofed enclosure that is too small for any priest or dedicant to stand in. Larger shrines also exist such as

45 R.J.A. Talbert, *Barrington Atlas of the Greek and Roman World*, Princeton, 2000, sheet 80 (labeled as "Bakare"); J. Keenan, S.E. Sidebotham, T. Wilfong, "Map 80 Coptos-Berenice", in R.J.A. Talbert (ed.), *Barrington Atlas of the Greek and Roman World. Map-By-Map Directory* (Vol. II), Princeton, 2000, p. 1172. B. Tratsaert kindly supplied details for the shrine at Bokari/Bakare.

46 Talbert (ed.), *Barrington Atlas, op. cit.,* sheet 78; Sidebotham, *ibid.*, p. 1159.

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the three-roomed edifice at the apparently Ptolemaic gold mining settlement at Bir Sirbakis (26° 23.45' N, 33° 27.08' E).[47] Unfortunately, the few potsherds found in the proximity of the Abu Diyeiba shrine are non-diagnostic, but it seems likely that the structure is contemporary with the quarrying operations.

4. Other Remains

Stone huts were found outside of the main and satellite settlements at only four sites (H1-H4 in fig. 3). H1 and H4 are crude, single-room shelters with rock outcrops forming one side and low walls (less than 0.5 m in height) framing the other sides. H1 is the larger of the two, measuring 1.8 by 2.5 m, and is notable for having numerous fragments of amethyst littering the ground. Both shelters have charcoal-laced fire pits on the surface, suggesting either modern reuse or even recent Bedouin construction. The other two sites, H2 and H3, have better built huts with dry-laid, stacked-stone walls on all sides. There are two well-preserved single-room huts at H3, each measuring about 2 by 3-4 m with the walls still standing up to their maximum height of 0.5 m. H2 is a single square hut about 2 m on a side with tumbled walls that would have been about as high as those at H3.

At each of four sites in and near Wadi el-Gamasht there are numerous rock-cut petroglyphs on the sandstone outcrops (G1-G4 in figure 3). They all contain crude depictions of animals, mainly camel and ibex, which were pecked or scratched through the rock's dark desert varnish (fig. 20). The rock surfaces around G1 have numerous hash marks like those seen around the inscribed foot outlines above the main settlement. Besides the previously mentioned cairns on the hilltop at the mouth of Wadi el-Gamasht, single cairns were also observed at C2, on the approach to the main settlement, and at C3, on a high hill near the southern limit of the quarry.

POTTERY

As previously indicated, pottery sherds found at Abu Diyeiba were photographed, and it was from the photographs that the identifications and drawings were made. Table 1 summarizes the results of the pottery analysis. Precise dating is difficult as some of the vessels represent Ptolemaic forms that continued into the beginning of the Roman period. Nevertheless, it is evident that only a small portion of the pottery examined dates to Ptolemaic times with most of it coming from the early Roman period (late first century BC to early first century AD, i.e. the Augustan era). Some also dates to the latter part of the early Roman period (up until the mid-second century AD). The vessel varieties are described below.[48]

47 Talbert, *op. cit.,* sheet 78; S.E. Sidebotham, *ibid.*, p. 1159.

48 The authors wish to thank Roberta Tomber (Honorary Fellow of the Department of Conservation, Documentation and Science in the British Museum) for her assistance with the pottery.

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Location within Quarry (see fig. 2)	Ptolemaic Period (3rd to 2nd c. BC)	Early Roman Period (late 1st c. BC to early 2nd c. AD)	Modern Period	Figure Number
Main settlement		amphorae		fig. 21, nos 2-3 & 7-9
		table-wares & cooking pots		fig. 22, nos 2-4
		clay bowls		fig. 22, no. 6
	faience bowls			fig. 22, no. 7
Ridge east of main settlement	amphorae	cooking pots		fig. 21, no. 4; fig. 22, no. 1
Rock shelter west of main settlement		amphorae		fig. 21, no. 1
Temple	miscellaneous			
Quarry trench at site M & nearby		miscellaneous	white porcelain	
Quarry trench at site P1		amphorae & clay bowls		fig. 21, no. 5; fig. 22, no. 5
Quarry trenches at sites P2 & P3	miscellaneous	amphorae		fig. 21, no. 6

TABLE 1. Pottery from the Abu Diyeiba Amethyst Quarry.

1. Egyptian Amphorae

The majority of amphorae belong to two groups.[49] The first consists of vessels with short, tronconical necks, a rolled rim, and large handles attached at the curve of the neck and under the rim (nos 1-8 in fig. 21). The exterior surface is light colored and completely smooth without any ribbing. Most of the sherds are made from a red marl clay of Egyptian origin, and exhibit a gray core. Although difficult to tell from the photographs, it appears that some of the amphorae have a Nile silt fabric (no. 3 in fig. 21). The same distinctive rim continued in use from the third century BC into the early first century AD, but this first group of amphorae is most closely related to the AE3a type manufactured at the beginning of the early Roman period.[50] The bases of these amphorae (nos 7-8 in fig. 21), however, do not seem to continue past the Tiberian period. The second group of amphorae is ribbed with what appear to be ovoid loop

49 For Ptolemaic parallels see: R.S. TOMBER, "The Pottery", in S.E. Sidebotham, W.Z. Wendrich (eds.), *Berenike 1996 –Report of the Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert*, Leiden, 1998, p. 167, fig. 6-2 and p. 169, fig. 6-3; *id.*, "The Pottery", in S.E. Sidebotham, W.Z. Wendrich (eds.), *Berenike 1997– Report of the Excavations at Berenike and the Survey of the Egyptian Eastern Desert, Including Excavations at Shenshef*, Leiden, 1999, p. 139, fig. 5-6 and p. 141, fig. 5-7; G. PIERRAT-BONNEFOIS, "La céramique dynastique et ptolémaïque des fouilles à Tôd, 1989-1991", *CCE* 6, 2000, figs. 213 to 216. For Roman parallels see: R.S. TOMBER 1999, *op. cit.*, nos 27 to 33 in fig. 5-4; *id.*, "Pottery", in V.A. Maxfield, D.P.S. Peacock (eds.), *The Roman Imperial Quarries. Survey and Excavation at Mons Porphyrites 1994-1998. Volume I: Topography and Quarries*, London, 2001, nos 4 & 20 in fig. 6.1; *id.*, "Early Roman Egyptian Amphorae from the Eastern Desert of Egypt: a Chronological Sequence", *CCE* 8, in press, figs 1 and 3.

50 *Ibid.*, fig. 1.

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handles that join to the rim (no. 9 in fig. 21). This is the well-known AE3b amphora found throughout Egypt and dating from the mid-first century AD into the second century AD.[51] It is, however, most typical of the second century AD, particularly the Antonine period.

2. Egyptian Table-Wares and Cooking Pots

There are two groups of table-wares and cooking pots, both made from Egyptian alluvial clay.[52] The first has thin walls, and was produced from the late first century BC into the first century AD (nos 2-4 in fig. 22). The second group, consisting only of cooking pots, has an internal rim with the Greek "caccabee" form, and dates from the late first century BC into the second century AD (no. 1 in fig. 22).

3. Egyptian Bowls

Three groups of clay bowls at Abu Diyeiba all date to the early Roman period, and the first of these includes deep, convex vessels made from Egyptian alluvial clay.[53] The second group of bowls is shallower and may be described as carinated dishes (no. 5 in fig. 22),[54] and the final group is thin-walled ware similar to bowls made from Aswan clay (no. 6 in fig. 22).[55] A small convex bowl made from bi-colored (ultramarine blue and turquoise blue) faience likely dates to the early Ptolemaic period (3rd century BC) (no. 7 in fig. 22).[56]

GREEK INSCRIPTIONS

Four inscriptions from Abu Diyeiba were published by A. Bernand (his *I. Pan* 59-62).[57] Two of these (*I. Pan* 60-61) and part of a third (*I. Pan* 59) were found and photographed by L. A. Tregenza and published by D. Meredith from the photographs;[58] and one (*I. Pan* 62) and the other part of *I. Pan* 59 were found by the phosphate mining company active in the vicinity. Based on Bernand's transcriptions, *I. Pan* 60-62 can be translated as follows:

51 *Ibid.,* fig. 3.

52 For Roman parallels see: R.S. Tomber, in *Berenike 1997*, 1999, no. 10, fig. 5-2; *id.*, in *Mons Porphyrites 1994-1998. Vol. I*, 2001, *op. cit.*, no. 7 in fig. 6.15.

53 For parallels see: *id.*, in *Mons Porphyrites 1994-1998. Vol. I*, 2001, no. 23 in fig. 6.3.

54 For parallels see: *id.*, in *Berenike 1997*, 1999, no. 16 in fig. 5-2.

55 For parallels see: *id.*, in *Mons Porphyrites 1994-1998. Vol. I*, 2001, no. 8 in fig. 6.3.

56 For parallels see type 3 bowls in: M.D. Nenna, M.S. El Din, *La vaisselle en faïence d'époque gréco-romaine. Catalogue du Musée gréco-romain d'Alexandrie*, *EtudAlex* 4, 2000, p. 57, fig. 9.

57 A. Bernand, *Pan du désert*, 1977, nos 59-63 on p. 136-140; this volume is herein referred to as *I. Pan*. Bernand also mentions a fifth text (*I. Pan* 63), which was found near the Bir Waseef settlement about 6 km southwest of Abu Diyeiba. Other abbreviations for texts of inscriptions cited in this paper are *SB* = Fr. Preisigke, Fr. Bilabel, E. Kiessling, H.-A. Rupprecht, *SammelbuchGriechischer Urkunden aus Ägypten* I, Strassburg, 1913-1915; *I. Alex. Ptol.* = E. Bernand, *Inscriptions grecques d'Alexandrie ptolémaïque*, Cairo, 2001; and *I. Koptos-Kosseir* = A. Bernand, *De Koptos à Kosseir,* Leiden, 1972.

58 D. Meredith, *EOS Comentarii Societatis Philologae Polonorum* 48/2, 1957.

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I. Pan 60

To Pan of the good road and beneficent god and to Harpocrates, for the safety and health and - - - Alexandros son of Zenodoros - - - Spemminis son of Hermon - - - Imouthes son of Paos - - - controller.

I. Pan 61

- - - Zenodoros, agent; Spenminis son of Hermon - - - -minis son of Hermon, Imouthes son of Paos, Ones son of Polito---, - - - son of Totoes, A- - - controller, Hermophilos his son, Petokas.

I. Pan 62

To Isis and Sarapis and Pan who listens to prayers, for remembrance, Pan[iskos?] - - -.

Bernand remarked that "la présence des exploitants modernes rend improbable qu'on puisse encore découvrir des pierres inscrites dans cet endroit ainsi fréquenté".[59] Happily, this pessimism has proven to be misplaced. During the summer 2004 survey another fragment of *I. Pan* 59 came to light, allowing an improved reading and restoration of the whole (our no. 1). And several other fragmentary inscriptions, which fit well with the material already published, were found as well. Nothing in the scanty remains of these would push us to date them at any distance in time from the second century BC, but apart from no. 1, there is not much to support any particular dating. Also apart from no. 1, the inscriptions are too fragmentary to allow any meaningful translation.

The new texts that follow are based on photographs taken in the field. All of the texts, including those discovered previously, are inscribed on tablets cut from the local Nubia sandstone and come from the main quarry settlement at Abu Diyeiba. Those found in the present study have been reburied near these ruins.

1. Dedication to Ptolemy VI Philometor and Cleopatra II [FIG. 23]

Height, 15.0 cm Width, 15.0 cm Thickness, 5.0 cm Letter heights, 1-1.3 cm

Two fragments of this inscription were previously known, the left piece found by Tregenza at the site and the right in the phosphate company's storeroom. Published by D. Meredith;[60] reproduced by J. and L. Robert,[61] and A. Bernand[62] (*I. Pan* 59), the latter with a plate of poor quality. The restorations of Meredith, reproduced by Bernand, are shown by the new fragment to have been partly incorrect. The portion contributed by the new fragment is underlined in this text. The parts in square brackets are those not present in any of the fragments.

59 A. Bernand, *Pan du désert*, 1977, p. 136.
60 D. Meredith, *op. cit.*, no. 1 on p. 118.
61 J. & L. Robert, "Bulletin épigraphique 1958", *REG* 71, 1958, no. 537 on p. 350.
62 A. Bernand, *Pan du désert*.

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1 Βασιλ[εῖ Πτο]λ̣εμαίωι καὶ
2 βασιλίσσηι Κλεοπάτραι θεοῖς Φιλο-
3 μήτορσι καὶ Πανὶ Ἐπηκώ̣ωι καὶ Εὐχαρίσ-
4 τωι καὶ Ἁρο̣ήρει θεοῖς μεγί̣στοις ὑπὲρ
5 Διονυσίου τοῦ Λυσιμάχου ἡγεμό̣νος ...
6 [... ... . . τ]ου καὶ Πανίσκου τῶν υ̣ἱῶ̣ν ...
7 [... ... .] ὑπουργοὶ ευ[... ... .]

Translation

To King Ptolemy and Queen Kleopatra, the Mother-loving Gods, and to Pan who listens to prayers and is beneficent, and to Haroeris, the great gods, on behalf of Dionysios son of Lysimachos, commander… and Paniskos his sons… assistants…

Bernand's text shows that he saw traces of two more lines, but no remains of these appear on the new fragment. Only the faintest of traces appear in lines 5-6 of the new fragment. It should be noted that in line 1 there is an apparent blank at the end of the line, about four letters wide, as the lapicide evidently did not wish to begin the queen's titles on this line.

The major contribution of the new fragment is to show that Apollo was not mentioned in line 3, as had been restored by Meredith and Bernand (Ἀπόλλωνι | τῶι καὶ Ἁρο̣ήρει) and that it is the superlative, not μεγά̣[λοις, that was cut in line 4. The only other attestation of εὐχάριστος as an epithet for Pan known to us in the Eastern Desert is *I. Pan* 60 from Abu Diyeiba, where the titles are read and restored as [Πανὶ Εὐό̣]δωι Εὐχ[αρίστωι | θεῶι καὶ] Ἁρποχρά̣τη[ι. The first letter in line 1 of that text is certainly a delta, as one can see on the published plate,[63] thus excluding the possibility that Ἐπήκοος was the epithet used. The space-filler θεῶι in line 2 seems less secure.

About the date, Bernand remarks, "La mention du roi Ptolémée VI Philométor et de sa femme Cléopâtre II, qu'il épousa en 175 av. J.-C., date le texte de la période 175-145 av. J.-C., sans doute avant la naissance des enfants royaux, non mentionnés ici."[64] If that inference is correct, the date would have to be between 175 and 170 BC, because during 170-163 BC Ptolemy VI and Cleopatra II were either sharing power with Ptolemy VIII Euergetes II or temporarily out of power altogether; and their oldest son, Ptolemy Eupator, was probably born in 166 BC.[65]

The remains of lines 5 and 6 at the bottom of the new fragment are unfortunately very badly abraded and, to judge from the photographs, cannot yield any additional text beyond what is printed here.

63 A. Bernand, *Pan du désert,* 1977, pl. 55.1.
64 *Ibid.*, p. 137.
65 G. Hölbl (trans. T. Saavedra), *A History of the Ptolemaic Empire*, London, 2001, p. 192. Hölbl believes that Eupator was the first-born child, but this is not certain.

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2. Dedication to Isis, Sarapis, and Pan [FIG. 24]

Height, 51.0 cm Width, 30.0 cm Thickness, 5.5 cm Letter height, 1.2-1.7 cm

This dedication is badly eroded over much of its surface, and it is not clear whether anything has been lost. From the presence of Isis's name in the dative at the start of line 1, however, it seems likely that the left margin is mostly preserved. There is also no reason to suppose anything was lost at right between lines 1 and 2, or between 2 and 3. *I. Pan* 62 serves as a good model for what our inscription may have read, although ours is far lower in quality of letter-carving and in regularity. If the restoration of Pan at the start of line 3 is correct, it is puzzling to find what looks like pi at the right edge in line 3 before alpha and nu in line 4. One could suppose that we have here a faultily-divided personal name, like the Paniskos of *I. Pan* 62. But even so we would have the puzzle of line 3 itself, where the space should allow about four or five letters after the restoration of Π[*ανί* ("to Pan"). That is not enough for one of Pan's epithets (*εὐόδωι*, *εὐχαρίστωι*, *ἐπηκόωι*, *ὀρεοβάτηι*, *θεῶι μεγίστωι* – "of the good journey, beneficent, who hears prayers, mountain-walker, greatest god"). Perhaps it is just *θεῶι*, which does occur alone in Wadi Hammamat's *I. Koptos-Kosseir* 61. There are traces suggesting that there may have been a fifth line.

1 Ἴσιδι κ̣α̣[ὶ Σ-]
2 ᾰ̣ρ̣άπ̣ι κ̣α̣[ὶ]
3 Π[*ανὶ* ... .] Π
4 AN[

3. List of Names of Dedicants [FIG. 25]

Height, 33.0 cm Width, 22.5 cm Thickness, 5 cm Letter height, 0.8-2.2 cm

This stele has been reassembled from four fragments, but there are significant gaps even so, and the alignment of the fragments is not entirely secure. Worse, much of the surface has seemingly been cut away in a later reuse, causing damage to the bulk of the inscription and the almost total loss of the penultimate line. The remains seem almost entirely to belong to personal names; in this respect it resembles *I. Pan* 61.

1 [- ca. 12]*ωι*
2 [- ca. 12].*ο*
3 [- ca. 11].*ρις*
4 *ω*[ca. 10]*ξε*
5 *σκ.*[ca. 11]
6 *λωνί*[*ου* ca. 8]
7 *νίου* [ca. 9]
8 [... . .] *ισι.*[...]*α.*
9 [... .]. . *ιε (ἔτους)* [. .]. .
10 Θεογένους τῶν
11 [ca. 8] . . *αι*
12 [...].[...] *ις (ἔτους)* *vacat*

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In line 2, a diagonal stroke, slightly curved, follows the omicron, from upper left to lower right. Its meaning is not evident. After the lacuna in line 3 is part of a diagonal, possibly the right side of alpha. In line 5, there are faint traces resembling an eta before the break; but there is a diagonal stroke (upper left to lower right) faintly visible before that which is difficult to interpret. One might be tempted to read *σκλ̣η*[*ρουργ*--, "worker of hard stone", but lambda elsewhere here is much larger than the squeezed-in letter we would have to suppose here. There are traces in the lacuna in line 7 which may be remains of letters but could be part of the damage to the surface. The traces in line 8 might be compatible with reading *Ἰσι̣δ̣*[*ώρ*]*α̣ς* (genitive of the name Isidora), but we do not expect a woman's name here, and the reading is by no means inescapable. In line 9, after epsilon is a tall vertical and the beginning of a horizontal stroke at its bottom, resembling the year-sign in line 12. Before the numeral, one might be able to read *τ̣*[*ο*]*ῦ̣*, depending on the precise placement of the fragments. The traces in line 11 might belong to two or three letters before the alpha. The space seems too broad to permit ATAI as in *ἐργάται* ("workmen").

The genitive plural definite article after Theagenes' name (in the genitive) makes it tempting to think of Theagenes *τῶν πρώτων φίλων καὶ τῶν ἐφημερευόντων τοῖς βασιλεῦσιν εἰσαγγελέων* ("one of the first friends and ushers in attendance on the sovereigns") who occurs in the undated *SB* I 5021, now republished with commentary and bibliography by E. Bernand as *I. Alex. Ptol.* 58. This is a dedication of unknown provenance, usually assigned to Alexandria or the eastern Delta, of a statue of Theagenes' father, perhaps named Zenon, himself also formerly one of the first friends and a senior financial official in Alexandria. As L. Mooren has shown,[66] the aulic titulature points to a date no earlier than the last quarter of the second century. If that connection were taken further, the year 16 in line 12 here would be 99/8 BC (year 16 of Ptolemy X Alexander), the first year 16 to occur since 190/189 BC, the 16th year of Ptolemy V Epiphanes.

All of this speculation, however, may be idle in the face of the fact that the remaining traces in the following line clearly do not belong to *φίλων* (genitive of "friends"), as they would have to if the phrase *πρώτων φίλων* ("one of the first friends") was written in full in this line.

4. Dedication to Isis and Pan [FIG. 26]

Height, 26.0 cm Width, 22.5 cm Thickness, 7.0 cm Letter height, 0.9-1.7 cm.

The remains of three lines are visible in the upper part of this stone. The lower part, despite stray scratches here and there, seems to be uninscribed.

1 *Ἰ̣σ̣ε̣ιδι κ̣α*[*ὶ*
2 *Πανι̣*⟨*ί*⟩ [
3 *Ἀριστει. .*[

66 L. Mooren, *La hiérarchie de cour ptolémaïque*, Leuven, 1977, p. 158.

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The letters at the end of line 1 might be read as *κ̣α̣*[*ί*, but kappa is not persuasive and there is no sign of a cross-bar on the putative alpha. Lambda is a more attractive reading. The two short vertical strokes that make up the first letter do not obviously suggest anything. The surface in line 2 seems uninscribed after the first three letters, so that it seems necessary to suppose that iota was omitted rather than being effaced. In line 3, the penultimate letter looks on the photograph most like omicron, but Aristeios is not one of the usual Ἀριστ- names, and it is not possible to read Ἀριστέας, Ἀρισταῖος, Ἀριστείδης, Ἀρίστιππος (Aristeas, Aristaios, Aristeides, Aristippos), or any of the other plausible choices. He is presumably the dedicant.

5. Dedication to an Unknown Person or Deity [FIG. 27]

Height, 36.0 cm Width, 37.0 cm Thickness, 7.7 cm Letter height, 0.6-1.6 cm

The original inscribed area of this stone is preserved except at upper left, where there is some loss. The surface, however, is very badly damaged throughout, leaving only patches of letters partly legible and a high degree of uncertainty about what traces belong to letters and what do not. It is thus not possible from the photograph to reconstruct the original text in its entirety. From the relatively legible first line, it seems likely that the text was a dedication similar to *I. Pan* 60, also dedicated to *Pan Euodos Eucharistos*.

1 [*Πανὶ Εὐόδωι*] *Εὐχαρίστωι*
2 [- ca. 9 -] traces
3 [... .]*ϑε* traces
4 traces *τ.ς*
5 *... . κνιας* traces
6 *. . λιχεως ε... . του*
7 *α . .*[

In line 5, one might look for the rare *τεκνία* (“little children”), a diminutive referring to the young children of the king and queen.[67] But the traces before kappa are not obviously supportive of this reading. If it were correct, lines 2-4 would have to be occupied with royal titulature; obviously *ϑε* in line 3 would be compatible with such an interpretation. The traces in general just seem too exiguous to support such a reading. This inscription may be associated with a pictorial relief carving, traces of which are visible along the lower edge of the slab.

67 J. BINGEN, “I. Philae I 4, un moment d’un règne, d’un temple et d’un culte”, *Akten des 21. Internationalen Papyrologenkongresses*, *AfP* Beiheft 3, Leipzig, 1997, p. 88-97.

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6. Dedication to Pan [FIG. 28]

Height, 29.5 cm Width, 19.0 cm Thickness, 8.0 cm Letter height 0.5-0.8 cm

There are traces of four lines, but except for the first line they are so effaced as to make any reading too speculative to print. Line 2 may begin with mu. The stone is broken at right and possibly below. The text for line 1 may be given as:

Πανὶ Εὐό̣[δωι

Pan Euodos ("Pan of the good journey"), the name given in line 1, is attested in *I. Pan* 60, cited above, and numerous inscriptions from other sites.[68]

ANEPIGRAPHIC STELAE AND SELECTED CARVED OBJECTS

The fragmentary carvings discovered during the Wadi Abu Diyeiba survey offer insight into religious practices and images which would have accompanied the dedications and *proskynemata* of the Ptolemaic period, but which rarely survive. These items, all made from the local Nubia sandstone, include two stelae and blocks carved in the form of an altar and offering table. They were found among the ruins of the main settlement at Wadi Abu Diyeiba where they were presumably installed or used. These finds present uncommon evidence for visual aspects of religious practice at this remote desert site.

Without a firm excavation context, it is difficult to offer secure dates for any of these items and, as the epigraphic and ceramic evidence indicates, there is a considerable range of dates for the other antiquities discovered at the site, spanning from middle Ptolemaic to early Roman. That being noted, however, there is nothing in these anepigraphic materials which would be out of place in the Ptolemaic milieu and a date in the Ptolemaic period for each of these items seems probable.

As Ptolemaic stelae and religious artifacts, these items represent an exciting window into these practices in a part of Egypt which has, as yet, yielded very little evidence for the production of objects to accompany religious practice. Between the well-known Late Period images in Wadi Hammamat, which accompany royal inscriptions, and the epigraphic remains at the Paneion of al-Kanais,[69] there has been no evidence for personal dedications of images from the Ptolemaic period in the Eastern Desert. Their appearance at Abu Diyeiba suggests that the visual culture of the Ptolemaic Eastern Desert is, in fact, richer than might have been supposed and argues for additional work in the remains of Ptolemaic settlements throughout the region.

68 For references see note to *I. Pan* 86, line 12 on p. 260 in A. BERNAND, *Pan du désert.*

69 A. BERNAND, *Le Paneion d'El-Kanaïs. Les inscriptions grecques*, Leiden, 1972, passim.

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1. Stela with Striding Figure [FIG. 29]

Height, 38.5 cm Width, 26.5 cm Thickness, 4.0-5.0 cm

The most impressive of the carved items retrieved from Abu Diyeiba is a round-topped sandstone stela in fragmentary condition, which carries an image of a male striding left in profile and framed by the stylized depiction of a temple or shrine. The stela is broken into sixteen fragments, fourteen of which were reassembled in the field and photographed for later study. The central area and lower right corner of the stela are badly damaged and there are substantial gaps in the reconstructed image due to the loss of these fragments. It is simply carved, with single incised lines forming a plain outline of the figures which preserve no trace of color or other ornamentation. This small stela type is typical of votive dedications in the Ptolemaic period and there are several examples of such stelae that are equipped with holes in their rear and seem to have been designed for hanging.[70] A single drilled hole in the lower left-hand corner of this example suggests that it too may have been hung or attached to another surface, although the fragmentary state of its preservation makes it difficult to say with certainty how it might have been displayed.

The framing for the central figure is composed of a stylized representation of a temple or shrine, with a podium divided into four sections and flanked by simple columns. These columns have plain bases and irregular capitals which are elongated horizontally and form a simple frame for the poorly preserved head of the central figure.[71] The sun-disk with flanking cobras sits above the figure on a plain arched element evoking the winged sun-disk which usually appears in stelae of this type.[72] This architectural framework surrounds a male, leftward-striding figure shown in profile. The figure, of which only one foot is preserved, stands on the uppermost step of the podium and wears a long garment with overlapping folds and a triangular skirt. The edge of a fringed scarf which appears to be tied around the waist or torso of the figure shows above the edge of the overlapping fold of the garment, while the upper portion of the garment is heavily damaged and difficult to distinguish. This long garment is atypical for representations of deities or kings, who usually wear a short kilt, but has similarities to a garment type which is frequently attested on statues and statuettes of the Ptolemaic period.[73]

The figure's arm is bent at the elbow and overlaps the body at the waist. This arm cradles a long staff or scepter which ends just above the hem of the garment and extends beyond the figure towards the upper right-hand corner of the architectural frame. The staff is adorned with two strips of undulating material which extend from below the end of the staff and end

70 The most famous example of this type is Egyptian Museum CG 27567. S. WALKER, P. HIGGS (eds.), *Cleopatra of Egypt: From History to Myth*, London, 2001, no. 125 on p. 104; Catalogue *La gloire d'Alexandrie*, Paris, 1998, no. 141 on p. 195.

71 This depiction of a stepped podium is common in stelae of the Ptolemaic period. See Cairo Museum CG 27567, which is an example of a carved and painted third century BC limestone stela with an identical representation of the podium: S. WALKER, P. HIGGS, *op. cit.*, no. 125 on p. 104; Catalogue *La gloire d'Alexandrie*, *loc. cit.*.

72 See, for example, Louvre E 27113 for a more typical and elaborate representation of the winged sun-disk in this position: R. S. BIANCHI (ed.), *Cleopatra's Egypt, Age of the Ptolemies*, Mainz am Rhein, 1988, no. 78 on p. 188-189.

73 This garment type is discussed in relation to a Ptolemaic statuette from the Detroit Institute of Arts 51.83 by S. WALKER, P. HIGGS, *op. cit.*, no. 189 on p. 180.

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in a schematic fringe. Although these elements do not correspond with the standard depiction of the flail, their position above the shoulder of the figure and general resemblance to the flail makes it likely that this is an innovative representation of that element. The flail is usually carried by the pharaoh or Osiris, but is also often carried by Min, who was associated with the Greek god Pan. The identification of this flail-bearing figure as Min/Pan would offer a connection to the previously mentioned dedicatory inscriptions recorded by the survey.[74] If, indeed, this is Min/Pan, then one would expect to find the figure crowned by the tall plumes which are another of his attributes, but instead traces remain of an entirely different nature. Below the central sun-disk in the roof of the shrine, there are remnants of the outline of a circular object flanked by two sharp horns which curve outward and away from the central element. This image, poorly preserved as it is, resembles the upper portions of the horns and sun-disk usually associated with the goddess Hathor and worn by female deities and queens. Because of the break, it is impossible to speculate what crown or headdress may have adorned the figure, but its resemblance to the horned sun-disk offers a real challenge to the identification of this figure as Min/Pan, although eclecticism in the depiction would hardly be a surprise, given its remote context and the informality of the work.

In addition to the ambiguity of the headdress, the stela also offers another element which is difficult to explain. Immediately above the crooked arm of the figure and below and to the left of the 'crown,' there is stippling which forms a cluster that must have adjoined the face of the figure, and may have indicated hair or a beard. This stippling, which also appears on what may have been the shoulder or upper-right torso of the figure, is obscure and also adds to the complexity of its identification.

In light of the strange and somewhat contradictory elements present in this stela, it is difficult to state with confidence what deity or individual might be represented. The shrine or temple used as the figure's frame suggests a divine or royal status for the individual and given its find spot and associated inscriptions, the identification as Min/Pan seems most likely, although as stated earlier, there is considerable ambiguity in certain elements of the image. Nevertheless, the stela is a rare depiction of an informal votive dedication in the context of a desert shrine and as such, offers a glimpse into visual aspects of dedicatory practice in the Ptolemaic Eastern Desert which enhance our understanding of visual culture in this remote environment.

2. Stela with Female Figure [FIG. 30]

Height, 35.0 cm Width, 26.0 cm Thickness, 6.5 cm

A portion of a second round-topped sandstone stela was discovered with rough parallel cuttings and a rudimentary single-line carving of a central female figure in profile. This figure, which is lightly incised, is heavily damaged. The crown of the head, wig and right shoulder are preserved, but no traces remain of the face, ear or torso due to an unfortunate break in

74 Min/Pan is often shown with the flail floating over his upraised arm, as seen on a Ptolemaic stela from Tanis, BM EA 1054, but these depictions often present the god in his more usual ithyphallic manner and with other attributes that clearly identify him as Min, most of which are absent here: S. WALKER, P. HIGGS, *op. cit.*, no. 56 on p. 76; R. S. BIANCHI, *op. cit.*, no. 15.

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the stela, which is damaged along each of its edges. The figure is certainly female, as indicated by the hair, which seems to be a wig in two parts with a cap of curls on the crown of the head and tight corkscrew locks in the back, a style worn by queens of the late third to early second century BC.[75]

In addition to this hairstyle, there are faint traces of a headdress composed of an unusual diagonal band extending roughly from the location of the missing ear to the back of the head above the curls which extend down the back of the figure. An indistinct element that appears to be composed of several small projections juts out from this band towards the upper right-hand corner of the stela. Damage has obscured the outlines of this headdress, which may be a crude depiction of the double feathers and a crown of unclear type. The cap of curls and the projecting feathers at the back of the head might also suggest that the figure wears a simplified version of the vulture headdress of Isis, but there are no traces of the *uraeus* at the forehead, which is problematic. Without evidence for a crown, there is no reason to conclude that this figure *must* be Isis, since it could equally be a depiction of a dedicant or of a queen, but given the epigraphic evidence for the worship of Isis at the site, the goddess herself is the most plausible identification.

3. Altar and Offering Table [FIGS. 31-32]

Altar height, 26.0 cm	Width, 13.5-17.5 cm	
Offering table length, 42.0 cm	Width, 31.0 cm	Thickness, 7.5 cm.

Two small items of religious furnishings were also found among the remains of the settlement at Abu Diyeiba. The single small sandstone altar preserves a lower projection that suggests a pedestal and a raised upper portion which surrounds a rectangular piercing for the reception of offerings. The altar is undecorated. In addition, a rudimentary offering table, also in sandstone, was discovered in the same part of the settlement. This rather crudely cut table is preserved in two fragments, with a small piece of the table's main body missing from the upper left-hand corner. This offering table is simple in the extreme and is decorated with a plain incised line which forms the outline of the table. The Abu Diyeiba table lacks representations of gifts to the gods which are common on other Ptolemaic examples.[76] The table may be an abbreviated representation of a temple pool or the incompletely carved remains of what was destined to be a temple pool. Such temple pools were commonly used throughout Egyptian history. Numerous examples have been found along the Nile valley, especially in Nubia,[77] and

75 For parallels for this hairstyle, see British Museum GR 1917.5-1.97: S. WALKER, P. HIGGS, *op. cit.*, no. 41 on p. 66; F.H. MARSHALL, *Catalogue of the Finger Rings, Greek, Etruscan and Roman, in the Department of Antiquities*, London, 1907, no. 97. For a slightly later example, see British Museum EA 57348: S. WALKER, P. HIGGS, *op. cit.*, no. 47.

76 For example, see Ptolemaic offering tables from Karnak, now in the Luxor Museum, Luxor J.63 and Luxor J.153: B.V. BOTHMER (ed.), *Catalogue of the Luxor Museum of Ancient Egyptian Art*, Cairo, 1979, no. 275 on p. 177 and no. 278 on p. 178.

77 WILSON, in P. Rose (ed.), *Qasr Ibrim. The Hinterland Survey,* 1996, p. 110-111 and related figs; Ch. KUENTZ, "Bassins et tables d'offrandes", *BIFAO* 81, *Supplément*, 1981, p. 243-282.

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several have been excavated from late Roman contexts at the Red Sea emporium of Berenike.[78] The presence here of this incomplete or schematic temple pool suggests that some of those residing and working here may have been from Nubia.[79]

Each of the carved items recovered by the survey testifies to the diversity of religious practice at the site. The creation of spontaneous images, such as might be represented by the female stela, and more elaborate dedications, which the male stela certainly represents, round out our conception of religious activity in the desert. Without doubt, the presence of even these humble items demands a more diverse notion of the religious life of the quarry settlement and also requires that more attention be paid to the recording and preservation of the remains at these far-flung sites.

4. Fragment of a stone trough [FIG. 33]

Height, 13.5 cm Length, 25.0 cm Width, 18.5 cm Max. wall thickness, 7.0 cm; Max. thickness of base, 4.5 cm

In addition to the various religious objects, the survey also recovered a fragment of a trough carved from the local sandstone. The purpose of this trough could not be determined.

CONCLUSIONS

The brief survey and follow up study of finds from the amethyst quarry and settlements near Wadi Abu Diyeiba demonstrate that activities took place here from at least the second century BC, based on epigraphic evidence, into early Roman times, as indicated by the ceramics. The Ptolemaic period is not particularly noteworthy for its use of amethyst in jewelry, but this gemstone appears in jewelry worn by a number of women depicted in the so-called "Fayum" mummy portraits dating from the first and second centuries AD.[80] If we assume that the amethyst appearing in these portraits is Egyptian in origin and of Roman date, rather than heirlooms handed down over the generations, then the Abu Diyeiba quarry would have been the most likely source.

78 S.E. Sidebotham, W.Z. Wendrich, "Berenike: Archaeological Fieldwork at a Ptolemaic-Roman Port on the Red Sea Coast of Egypt: 1994-1998", *Sahara* 10, 1998, p. 94-95, figs. 19-20; S.E. Sidebotham, "Excavations", in *id.*, 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*, Leiden, 2000, p. 134-144.

79 Wilson, *op. cit.,* p. 104 (no. 26), fig. 3.19.

80 S. Walker (ed.), *Ancient Faces. Mummy Portraits from Roman Egypt,* New York, 2000, p. 54 (no. 16) of 100-120 AD [= S. Walker, M. Bierbrier, *Ancient Faces. Mummy Portraits from Roman Egypt,* London, 1997, p. 61-62 (no. 37) = E. Doxiadis, *The Mysterious Fayum Portraits. Faces from Ancient Egypt,* Cairo, 1995, p. 58 (no. 41)-photo reversed-dates this piece ca. 69-96 AD]; Walker, *op. cit.*, p. 154 (no. 110, see p. 155) [= Walker, Bierbrier, *op. cit.*, p. 170-171 (no. 209)] of the late second century AD; *ibid.*, p. 112-113 (no. 108) of about 100-110 AD [= Doxiadis, *op. cit.*, p. 164-165 (no. 102) dates this ca. 130-161 AD].

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Religious activities of the quarrymen are now better known, with Isis and especially Pan figuring prominently in their devotions. Judging from the small number of dwelling and rare burials at Abu Diyeiba, it appears that the work force was never large (perhaps less than 100) and was probably composed of seasonal workers from the Nile valley.

The extensive remains of quarrying trenches attest the importance of Abu Diyeiba for the production of amethyst over several centuries. The site was apparently abandoned sometime in the second century AD. It is not known whether Abu Diyeiba's supply of amethyst was exhausted or, more likely, this stone was supplanted by amethyst from India, which began arriving in Egypt in the first century AD and, as Pliny the Elder reports (*NH* 37.121-122), was of superior quality.

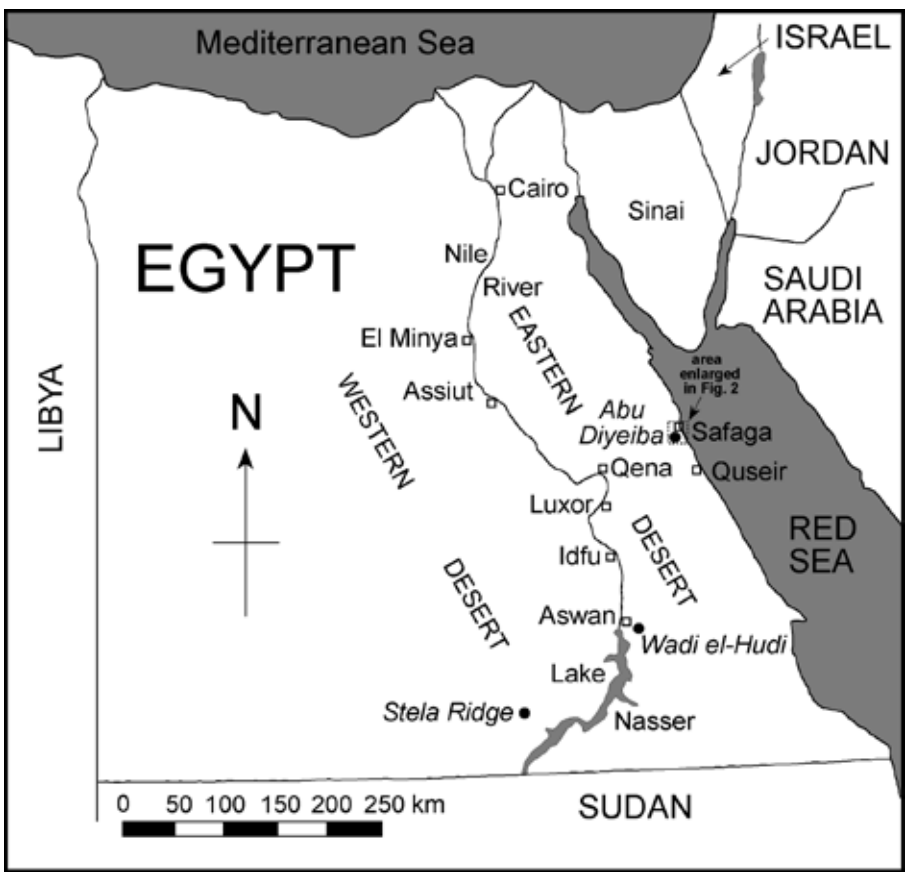


FIG. 1. Map of Egypt showing the locations of ancient quarries mentioned in this paper.

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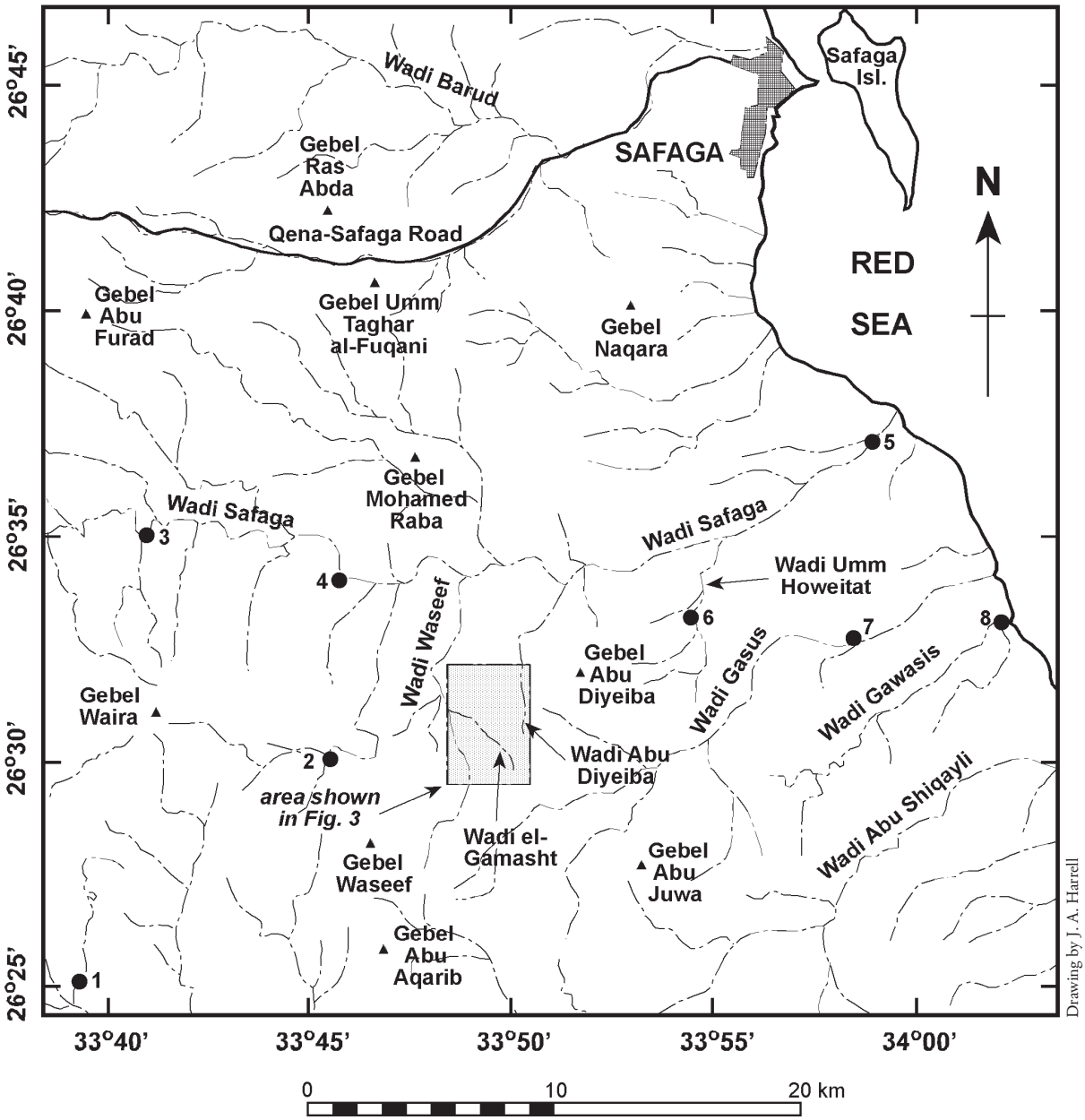


FIG. 2. Map of the Abu Diyeiba region showing the locations (numbered solid dots) of known archaeological remains.
1. Early Roman gabbro quarry in Wadi Umm Wikala
2. Late Roman settlement in a tributary of Wadi Safaga at Bir Waseef
3-4. Roman gold mines in Wadi Safaga
5. Roman *praesidium* in Wadi Safaga
6. Late Roman settlement in Wadi Umm Howeitat
7. 12th and 26th Dynasties settlement and lead mine in Wadi Gasus
8. Middle to New Kingdom port in Wadi Gawasis

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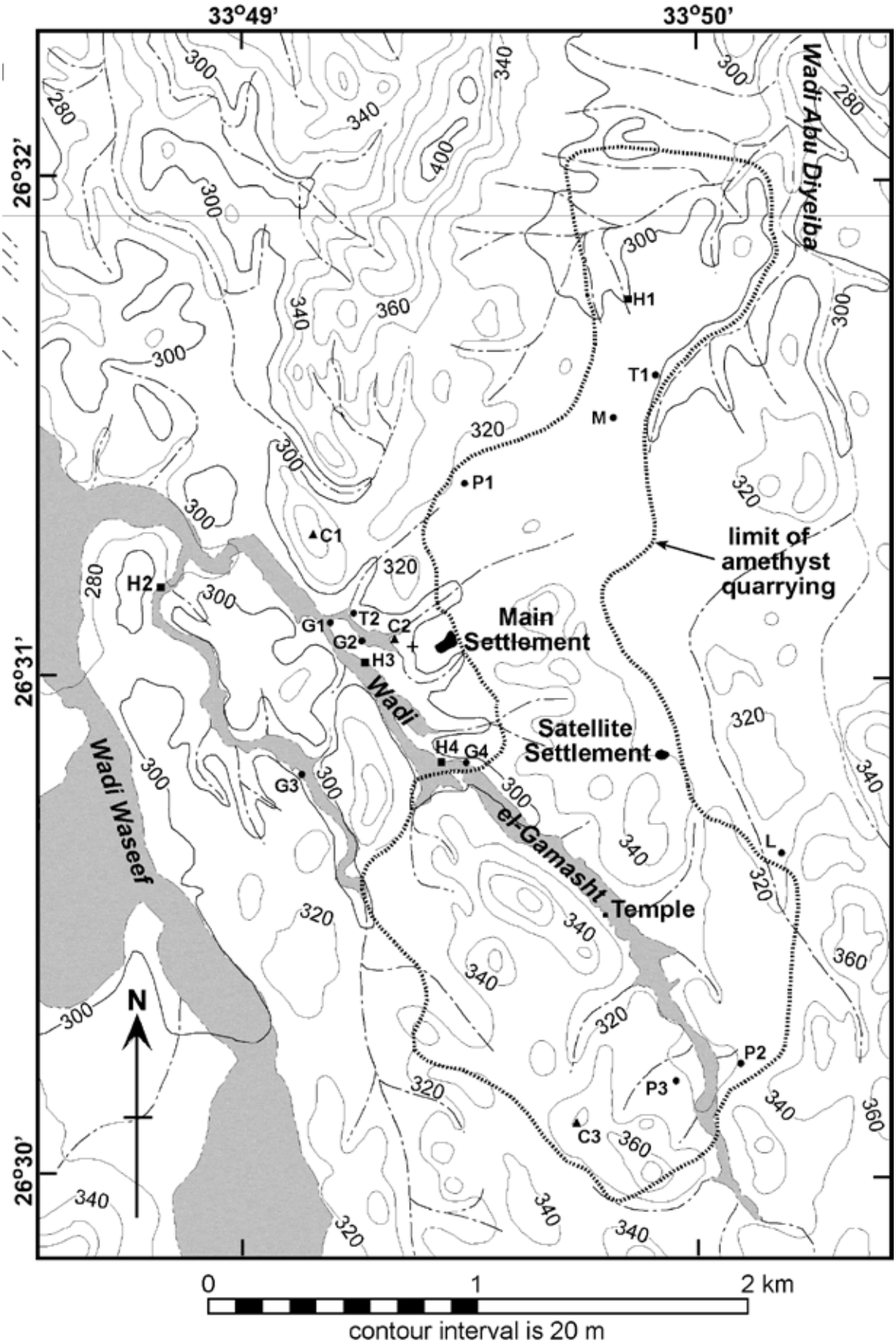


FIG. 3. Map of the Abu Diyeiba amethyst quarry.

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FIG. 4. Hilltop cairns at the mouth of Wadi el-Gamasht (C1 in fig. 3) View is toward the northwest with Wadi Waseef visible in the distance.

FIG. 5. Quarry trenches following amethyst-bearing quartz veins in the granite. View is toward the north.

FIG. 6. Close-up of quarry trench.

FIG. 7. Lines of stones at site L in Figure 3.

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FIG. 8. Overview of the main settlement. View is toward the northwest.



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FIG. 9. Remains of a well-constructed building on the south side of the main settlement.



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FIG. 10. Plan of the main settlement.

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FIG. 11. Outlines of feet cut into the sandstone bedrock on the east side of the main settlement. Note the later Arabic inscriptions in two of the feet at center and lower right. Scale is 20 cm long.


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FIG. 12. Outlines of feet with hash marks cut into the sandstone bedrock on the east side of the main settlement. Scale is 20 cm long.


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FIG. 13. Stone cross just west of the main settlement.

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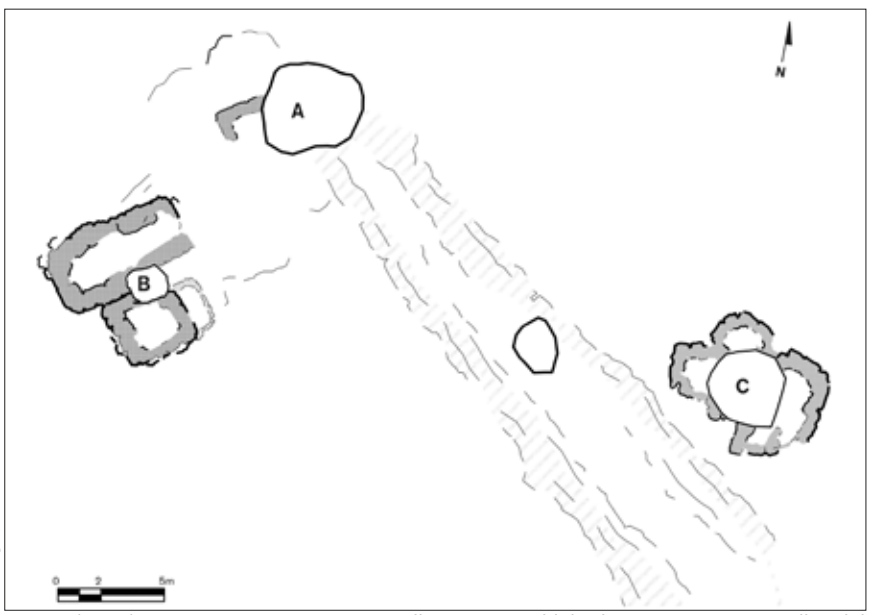
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FIG. 14. Overview of the satellite settlement.



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FIG. 15. Close-up of the largest stone hut in the satellite settlement (around boulder B in fig. 16).



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FIG. 16. Plan of the satellite settlement. Huts are built against boulders A-C. Extending from boulder A to lower right is a quarry trench flanked by ridge-like spoil piles.

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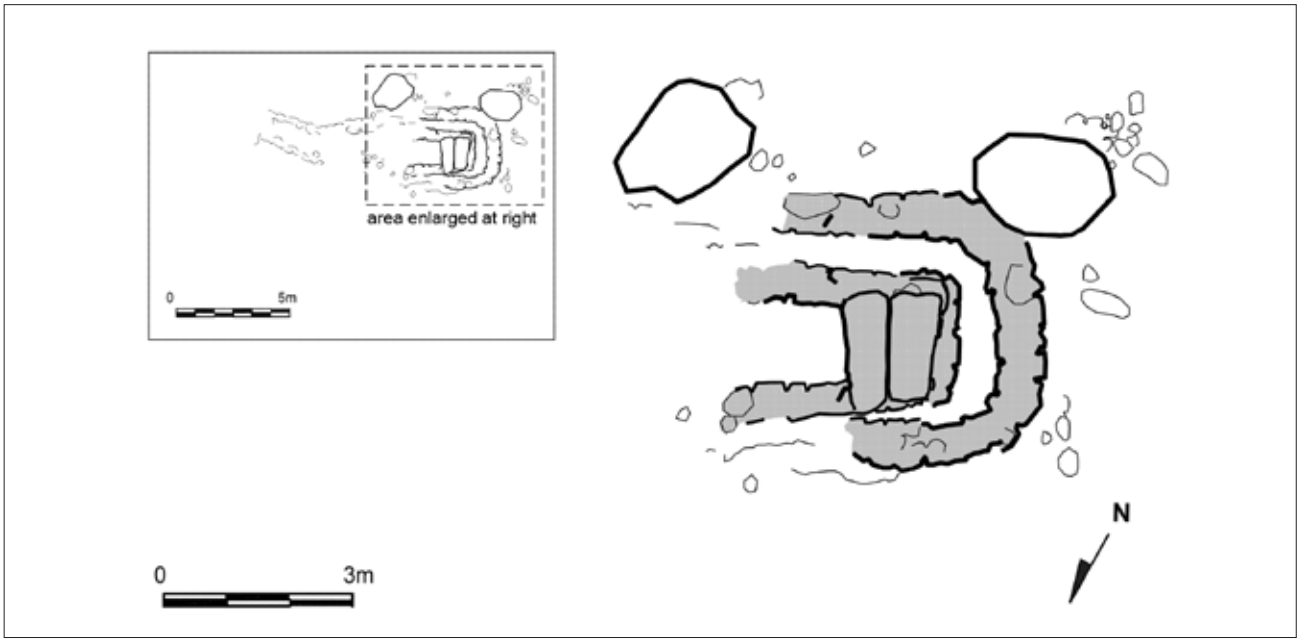
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FIG. 17. Small temple in Wadi el-Gamasht viewed from the front.

FIG. 18. Small temple in Wadi el-Gamasht viewed from the rear.

FIG. 19. Plan of the small temple. The inset box includes the processional way leading up to the temple.

FIG. 20. Camel and ibex petroglyphs carved in the sandstone bedrock (site G2 in fig. 3). The carved surface is approximately 1 m across.

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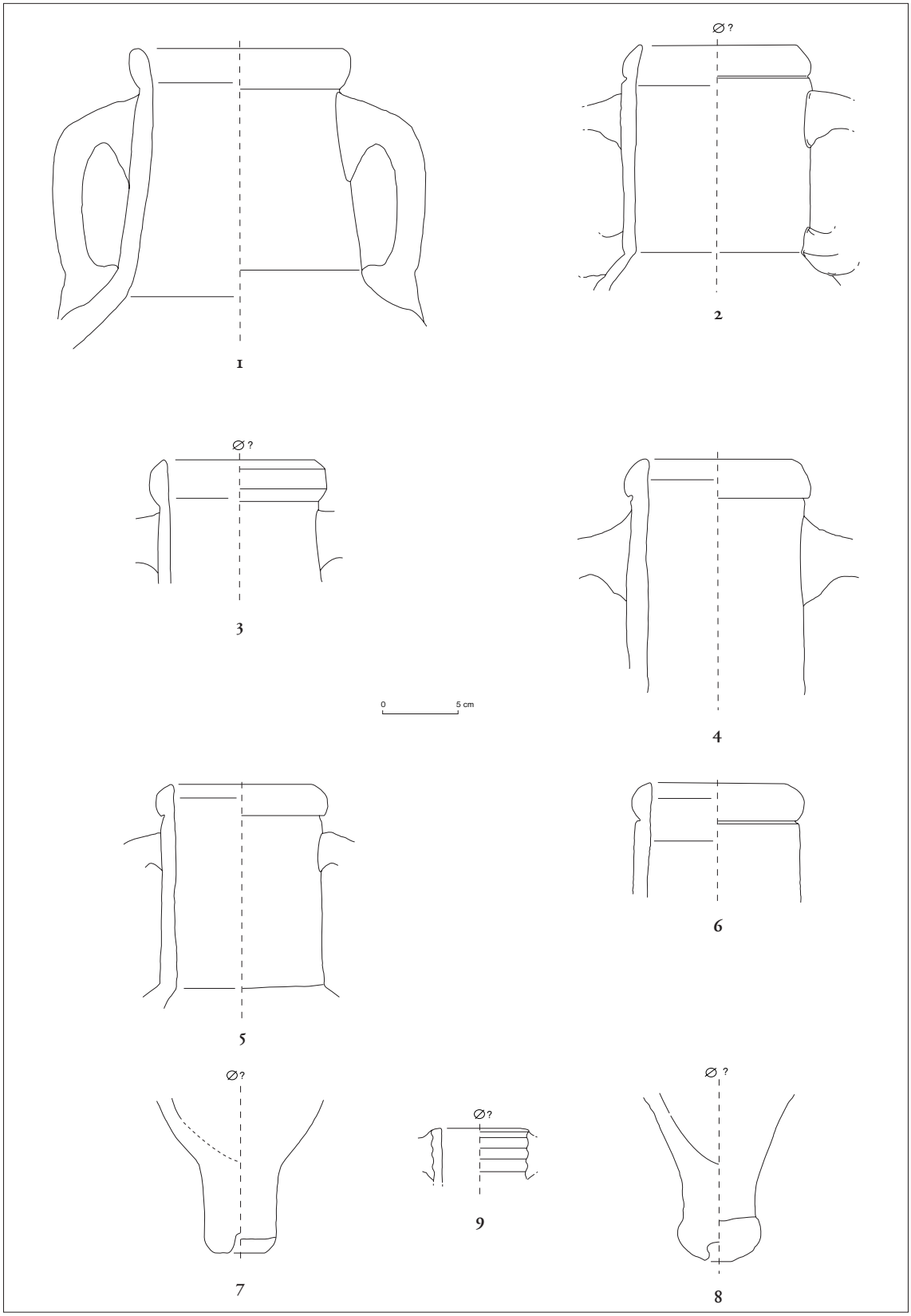
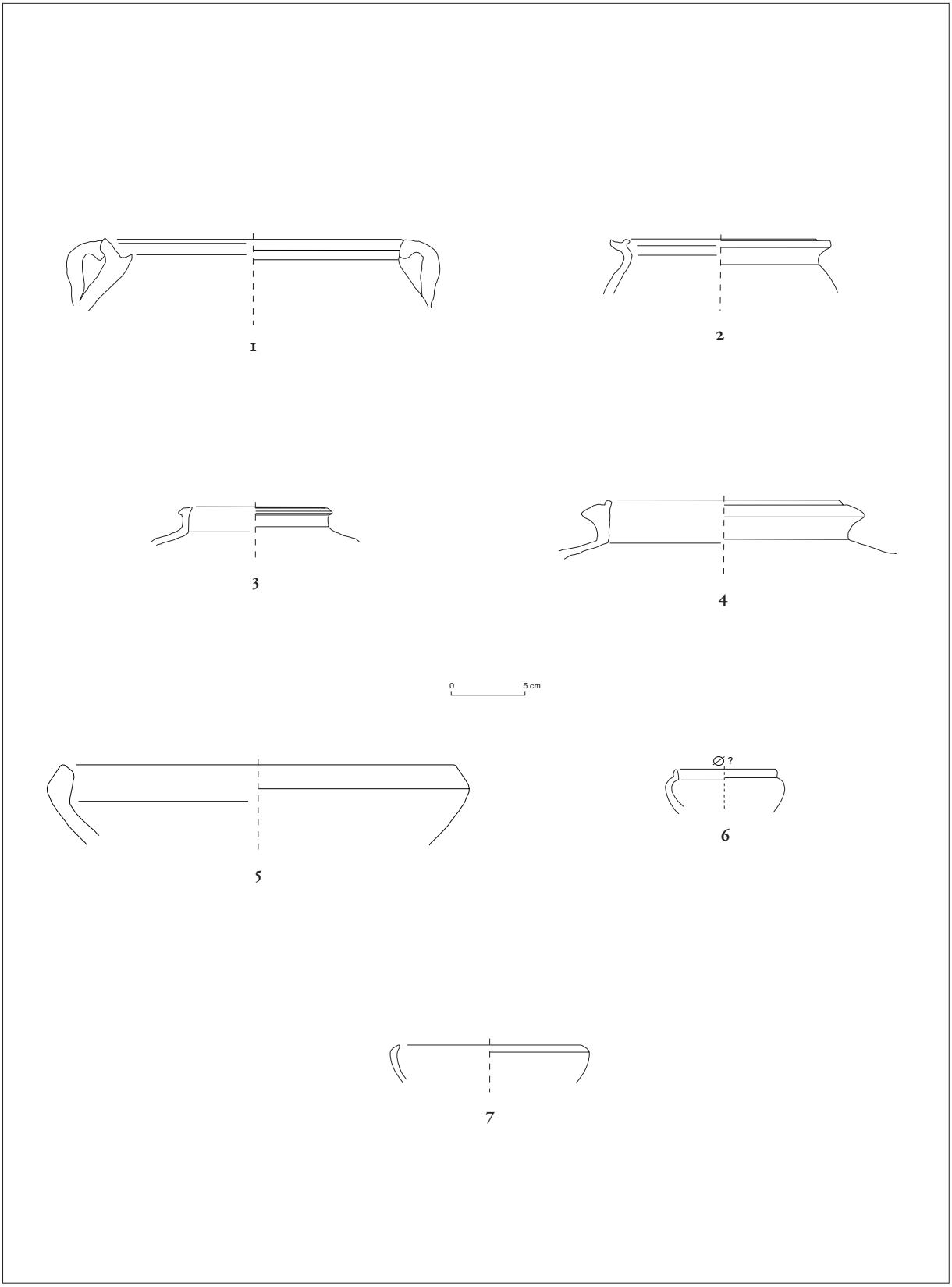


FIG. 21. Egyptian amphorae in marl and alluvial clays (nos 1-9). All date to the early Roman (Augustan) period but no. 9, an AE3 amphora, is restricted to the mid-first century AD.

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Drawing by S. Marchand

FIG. 22. Egyptian table-wares and cooking pots (nos 1-4), and bowls (nos 5-7).
All date to the early Roman period except no. 7, which is early Ptolemaic.

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FIG. 23. Dedication to Ptolemy VI Philometor and Cleopatra II (inscription no. 1). Stela is 15 cm wide at top.
FIG. 24. Dedication to Isis, Sarapis, and Pan (inscription no. 2). Scale is 20 cm long.
FIG. 25. List of names of dedicants (inscription no. 3). Scale is 20 cm long.



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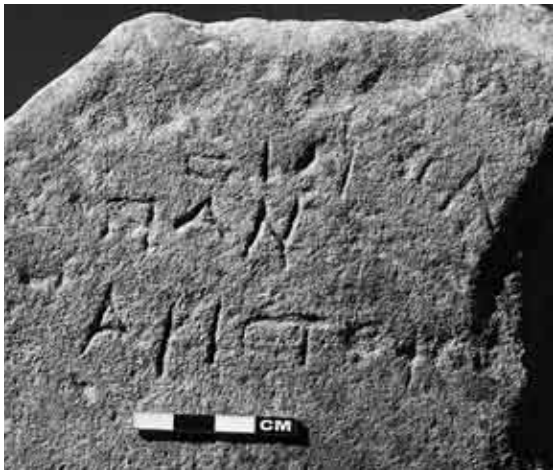
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FIG. 26. Dedication to Isis and Pan (inscription no. 4). Scale is 4 cm long.



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FIG. 27. Dedication to an unknown person or deity (inscription no. 6). Scale is 20 cm long.



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FIG. 28. Dedication to Pan (inscription no. 5). Scale divisions are 4 cm.

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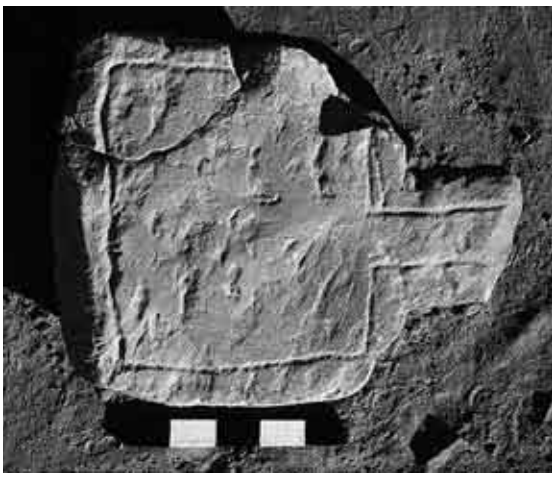
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FIG. 29. Sandstone stela with striding figure. Stela is 26.5 cm wide.

FIG. 30. Sandstone stela with female figure. Scale is 4 cm long.

FIG. 31. Sandstone altar. Scale is 4 cm long.

FIG. 32. Sandstone offering table. Scale is 20 cm long.

FIG. 33. Fragment of a sandstone trough. Scale is 4 cm long.

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