

SHIFTING CENTERS OF PRODUCTION:
THE AMPHORAE ASSEMBLAGES AT MONS PORPHYRITES AND BIR UMM
FAWAKHIR

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ABSTRACT

Brandon Baker: Shifting Centers of Production: The Amphorae Assemblages
at Mons Porphyrites and Bir Umm Fawakhir
(Under the direction of Jennifer Gates-Foster)

Mons Porphyrites and Bir Umm Fawakhir in the Eastern Desert of Egypt were two sites of resource extraction during the Roman and subsequent Byzantine occupation of Egypt. Mons Porphyrites was quarried for its vibrant purple stone featured in building projects such as the Pantheon. Bir Umm Fawakhir was a gold mine which was worked intermittently from the twentieth dynasty of the Egyptian pharaohs through the Ptolemies and into the Byzantine period. In this paper, I examine the amphorae evidence from both sites to trace the patterns over time in the distribution of goods including centers of production, routes of transportation, and the larger networks of supplying the labor forces at these zones of extraction. The end result is that the provisioning of the quarries and the mines took place in a complex system of trade which functioned alongside local lines of supply.

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INTRODUCTION

The Eastern Desert of Egypt has revealed multiple sites of ancient mining and quarrying activities to archaeologists, who have only recently begun to survey and excavate this arid landscape. Two of these sites will be the focus of this paper. Mons Porphyrites and Bir Umm Fawakhir lie about 85 miles from one another and were heavily exploited for their mineral resources at different periods (fig. 1). Mons Porphyrites was home to the igneous rock, porphyry, which was highly prized throughout antiquity and came in a variety of colors, but is mostly known for its deep purple hue, which is usually termed Imperial Porphyry.¹ The Romans quarried this stone from the first century CE until the abandonment of the site in the beginning of the fifth century.² South of these quarries lies the gold-mining site of Bir Umm Fawakhir, which was mined periodically from as early as the Twentieth Dynasty until the end of the sixth century CE, but appears to have its highest concentration of activity in the fifth and sixth centuries CE, which resulted in the construction of a gold-mining town to assist in the extraction and processing of the ore.³ Previously,

¹ cf. Williams-Thorpe, Jones, Potts, and Rigby (2001) and Klemm and Klemm (2001) for a detailed analysis of the geological and mineralogical properties of Egyptian porphyry.

² cf. Maxfield and Peacock (2007: 414-426) for a discussion of the chronology of the occupation and working of the site of Mons Porphyrites.

³ Harrell and Brown (1992) demonstrated the early exploitation of gold in this region of the eastern desert through the Turin papyrus, which details the location of gold-mines.

the architectural remains of the site were thought to have been a caravan station, but have been recently proven to be a Coptic/Byzantine gold-mining town.⁴

Juxtaposing the amphorae remains at both sites, I will establish a diachronic narrative of the differentiation in the distribution of goods to these Egyptian mining and quarrying complexes. These two sites of extraction provide the opportunity to examine the distribution of goods to quarrying/mining operations in the Egyptian desert for a relatively sustained period from the second century CE until the seventh century CE and provides the opportunity to study the shifting centers of amphorae production, particularly during the transition of Roman power from the west to the eastern capital of Constantinople. It should be noted that Mons Porphyrites was an Imperial quarry and seems to have had a hybrid labor force, while Bir Umm Fawakhir consisted of a locally sourced workforce, which may have been composed of family units.⁵ This distinction in the composition of the labor force between these two sites may account for some of the variance between amphorae remains at the site, but overall it appears to have had relatively little impact on the supply of goods to each site.

I will begin by contextualizing each site in terms of their location and overall layout as well as a brief history of occupation. Next, I will examine the textual evidence that exists regarding the provisioning of goods for sites in the Egyptian

⁴ cf. Meyer, 1998; Meyer, Heidorn, Kaegi, and Wilfong, 2000; Meyer, 2011; 2014.

⁵ The workforce at employed at these sites of resource extraction has been a hotly debated topic, particularly with the discovery of ostraca at Mons Claudianus, which establishes that many of the quarry workers were paid wage earners and not the slaves or forced labor of popular narrative. cf. Cuvigny, 1996 on the wages paid to the workers and Baker, 2015 for an argument concerning the skilled nature of the workforce at these sites of resource exploitation.

desert during the Roman period before examining the amphorae assemblages at each site. After examining the amphorae remains, it will be shown that as the centuries passed, the distribution of goods to these sites of resource extraction became much more locally focused. This was a result of the shifting political landscape and in an effort to cut costs by simplifying logistical constraints on the transportation and distribution of goods to these sites, which was already problematized through their locations in extreme geographical conditions.

MONS PORPHYRITES – SITE PLAN AND HISTORY

As stated above, Mons Porphyrites was the source of Imperial Porphyry, which was much sought after in the Roman and Byzantine empires. The quarries lie in the Gebel Dokhan, or 'smoky mountain', which is located in the Red Sea mountains of Egypt at East 27°13'3" and North 33°17'25" (Maxfield and Peacock, 2001: 2). The Lepsius, Lykabettus, and Rammius quarries sit on mountain tops, while the North-West quarries lie on a spur north-west of the others (fig. 2).⁶ A fort in the Wadi Abu Ma'amel and another on the southern flank of the Gebel Dokhan, called Badia, comprise the two main areas of settlement at the site. The workforce however, was not stationed at these areas, but in a number of villages in the mountains at close proximity to the quarries that were linked by a system of footpaths and slipways (Maxfield and Peacock, 2001: 2). The central complex consisted of the fort at Wadi Abu Ma'amel, a 'bathhouse', a necropolis, and temples to Serapis and Isis Myrionomos. The workers' villages near the quarries will be

⁶ The Lepsius, Lykabettus, and Rammius quarries were named by Schweinfurth (1875) in the nineteenth century, while the North-West quarries were named so by Meredith and Tregenza (1950).

referred to by the labels established by Maxfield and Peacock (2001). These are the Bradford Village, the Foot Village, the North-West Village, the South-West Village, the Ramp Village, and the Lykabettus Village.

The earliest literary source regarding the quarries is from Pliny, who mentions red porphyry from Egypt, but does not discuss the quarries themselves.⁷ Aelius Aristides draws allusions to the appalling conditions of a site located in the Arabian region of Egypt, which he thought was worked by convicts.⁸ Ptolemy, in his *Geographia* (4.5.27), located 'Porphyry Mountain' at latitude 26°40'. Diocletian's Edit of Maximum Prices values the stone at 250 denarii per cubic foot.⁹ Other references to the site discuss the activities of Christian anchorites in the area between the fourth and seventh centuries and contemporary documentation from Egypt in the form of papyri and ostraca acknowledge the delivery of grain, transportation of porphyry, and the travelling of people and goods to and from Mons Porphyrites.¹⁰

A dedication by Gaius Cominius Leugas, who seems to have discovered the site in 18 CE, appears to establish a *terminus post quem* for the site.¹¹ The earliest ceramic material produced is from the Bradford and Foot villages and dates to the

⁷ Pliny, *Natural Histories*. 36.57.

⁸ Aelius Aristides, *Aegyptios* 67, 5-12.

⁹ cf. Lauffer, 1971.

¹⁰ For the Christian anchorite sources cf. Palladius, *Historia Lausiaca* 34.3, 36, 2-3; *Acta Sanctorum* 67; and John Moschus, *Pratum Spirituale*, 124. *P. Oxy.* XLV 3243 discusses the transportation of grain to Mons Porphyrites, while the transportation of porphyry from the site is recorded in *P. Lond.* II 338; *BGU* 762 and *C.P. Herm.* 86. The ostraca from both the Nile Valley and the Eastern Desert, which make reference to people and goods travelling to and from Mons Porphyrites are *O. Bodl.* 1663; *O. Wilck.* II 951; *O. Claud.* 17, 62, 63, 67, 76, 80, and 143.

¹¹ cf. Van Rengen, 1995; Maxfield and Peacock, 2001: 60-62.

early to mid-first century CE (Maxfield and Peacock, 2007: 415). The origins of the North-West and South-West villages may also date to this period, but they maintained their functions as workers' villages for a longer duration of time than the Bradford and Foot Villages. The central complex containing the main fort appears to have developed and grown exponentially in the late first century. The pottery assemblages from the central complex generally date to the mid-to-late second century, but the numismatic and inscriptional evidence points to an early second century *terminus ante quem*.¹² The increase in activities and scale seems to have resulted in the construction of a second settlement site at Badia, but the evidence for its construction date is very sparse.

It was during the later second to early third centuries that the central fort was occupied the most intensively. It was also during this time that the South-West village was abandoned and the Lykabettus village came into use. The central complex now became the focal point of the site (Maxfield and Peacock, 2007: 420). Extraction of porphyry declined from the mid-to-late third century with the loosening of imperial control on the east.¹³ Material remains from this period of time are absent from the fort.¹⁴ If the site was truly abandoned during this period, activities quickly

¹² This evidence consists of two coins from the Flavian period, which were found inside the main fort, a Trajanic inscription (January 28th, 113 CE) from the temple to Isis, and an early Hadrianic inscription (117-119 CE) from the Serapis temple (Maxfield and Peacock, 2007: 417).

¹³ "It may be noted that the exploitation of the other major imperial quarry enterprise at Mons Claudianus came to an end in the late Severan period; another victim of the decline in imperial fortunes? However, Claudianus never revived, its products presumably being replaced by the more accessible (hence rather cheaper) products of the Troad quarries" (Maxfield and Peacock, 2007: 423).

¹⁴ "The inclusion of fragments of wall plaster in the redeposited material in the southern sebak, suggest a period of desertion during which time plaster peeled off the walls; this was then cleared out in anticipation of reoccupation in the late Roman period" (Maxfield and Peacock, 2007: 422).

resumed with a new era of imperial aggrandizement under the Tetrarchy. From the fourth to fifth centuries, the foci of activity shifted to the southern end of the site and centered around the Lykabettus area and the Badia complex, which is shown by the substantial amount of late material (Maxfield and Peacock, 2007: 424). Maxfield and Peacock (2007: 424) state that quarrying at the site ended by the middle of the fifth century. After extraction activities had ceased, the site became a refuge for Christian hermits and location for their burials.¹⁵

BIR UMM FAWAKHIR – SITE PLAN AND HISTORY

The main settlement at Bir Umm Fawakhir consists of 237 structures in all and rests in a narrow wadi, which runs southeast to northwest (fig. 3). There appears to be no plan to its layout, but rather the houses and their outbuildings are informed by the surrounding topography (Meyer, 2011: 31). The middle of the wadi appears to have served as the main thoroughfare, but there is no evidence of paving. The walls of all of the buildings are composed of dry-stone masonry, typically with two faces of granite cobbles and a filling of smaller stones and occasional potsherds. There is no evidence for roofing or second stories to these houses, but there are ancient trash heaps that generally lie behind the houses or in open spaces between them (Meyer, 2011: 36). These buildings fall into three overall categories associated with the site: agglomerated structures, houses, and outbuildings, but there are many variants and irregularities that preclude a formal

¹⁵ There is evidence of a tombstone to a John of Nilos in the necropolis outside the Lykabettus village (Scaife, 1934: 122-123) and a cross drawn in red paint on one of the pillars of a well (Wilkinson, 1832: 33,35).

typology. Meyer (2011: 50) posits that the inhabitants of these houses were kin, which is supported by the fact that the houses do not have the regimented layout associated with military barracks or workers' barracks.¹⁶ She also points out that in several parts of the site, the houses encircle and open onto a 'plaza' or private space.¹⁷ There has been no evidence of major public buildings and all of the structures appear to be domestic.¹⁸ There are fourteen outlying buildings in the vicinity of Bir Umm Fawakhir that all appear to have the same date and at least four appear to have been residential. Meyer (2011: 178) has suggested that perhaps they may have sheltered an overflow of workers at periods of intensive mining activity. Also absent are fortification walls and any structures that resemble churches, but there are guard posts on mountaintops overlooking the site (Meyer *et al*, 2000: 19).

The pottery and glass assemblages are the basis for the dating of the site between the fifth and sixth centuries CE. During this period, Meyer argues that the mines were worked intermittently for 150 years.¹⁹ The ceramic remains from the site demonstrate that the majority of resources were brought in from the Nile River Valley

¹⁶ Meyer (2014:130) also stresses the fact that the layout of the settlement is unregimented, has a lack of fortifications, contains silos that look like household granaries, and contains surprisingly rich finds from the limited excavations that have been conducted so far.

¹⁷ Meyer establishes the defining parameters for such 'plazas' as "three or more house units that surround an open space and have doors that open onto this space rather than onto the wadi 'street' (2011: 50).

¹⁸ Meyer concedes that "these buildings may have existed in the sandy, open area near the crossroads and the wells, precisely the area most damaged by flash floods and by twentieth-century mining activity and more or less the area now covered by the modern settlement" (2011: 50).

¹⁹ She supports this argument with the excavation of three levels of occupation during the 1999 season (Meyer, 1999), the comparanda of Mons Claudianus and the intermittent periods of working at the site, and the high cost of extracting gold from Bir Umm Fawakhir.

and that the site was intended to be a short-term settlement with little investment in elaborate architecture or luxury goods (Meyer, 2011: 52). In the larger historical context, it appears there were difficulties in acquiring and supplying gold for the various military and ecclesiastical expenditures as shown in an edict of Justinian I dated to 559 CE, which refers to lightweight *solidi* being circulated in Alexandria (Kaegi, 2000: 4).²⁰ If the gold supply truly was in jeopardy, it is possible that this site was commissioned, even though these mines seem to only have been marginally productive, and required sizeable capital to fund the extraction processes, which would most likely have come from a larger and wealthier entity able to provide such expenditure.

The labor population appears to have been composed of local workers, who came from the Nile Valley.²¹ While it may not be possible to say for certain that this is true, it seems to be a reasonable supposition. The lack of fortifications and unregimented layout of the site seems to suggest that these workers were paid and not captives or prisoners of war as has typically been proposed. Meyer believes that the site ceased production at the close of the sixth century to coincide with the conquest of Alexandria by the Sasanians in 619 and the rest of Egypt by 621 CE,

²⁰ "Edict 11 of Justinian I, dated to 559 and addressed to Peter Barsymes, Praetorian Prefect of the East, mentions a problem that is sometimes identified as one of 'lightweight solidi' or in any case, nominal gold solidi of a value of 81 (instead of the normal 72) to a Roman pound being circulated especially at Alexandria, where mintmasters and weighmasters, that is assayers, were profiting from charging a premium for fine-gold solidi and paying taxes and issuing gold bars in lightweight solidi values as though they were fine gold" (Kaegi, 2000: 4). For a translation and commentary on the edicts, cf. Thurman, 1964.

²¹ The argument for the workforce consisting of local labor is based upon not only the abundance of Aswan pink, marl, Nile silt, and amphora sherds that must have come from the Nile Valley, but also the small finds on the site such as glass, coins, the Bes amulet, a weight, and a pottery figurine fragment (Meyer et al. 2000: 23, fig. 51:a).

which cut off distribution of resources between Constantinople and Egypt (2014: 139).

PROVISIONING THE DESERT – TEXTUAL EVIDENCE

Provisioning the workers in these parched landscapes with food and drink requires an unimaginably high level of organization to acquire and transport everything from local orders for bread and wine to selected high-status commodities. Ostraca and floral and faunal remains found at Mons Claudianus reveal some intriguing aspects of the circulation of goods among workers in the desert. Roughly 22,000 animal bones from Mons Claudianus provide evidence that domesticated animals such as donkeys, pigs, camels, goat, sheep, chickens, and horses were imported for food and work. Fish and mollusks were imported mostly from the Red Sea, but there are also freshwater fish from the Nile Valley, such as catfish, present in the faunal record (Hamilton-Dyer, 2001: 298-301). Botanical remains include cereals, dates, olives, watermelons, grapes, and olive oil and suggest that they were imported in relatively large quantities.²² Private and official letters provide an insight into which goods circulated amongst specific segments of the quarry population and offer evidence for imports at Mons Claudianus. Cuvigny argues that most likely members of the Roman army were the recipients of vegetables and meat or fish since they received a higher pay than the skilled workers.²³

²² M. Van der Veen (1998: 108) states that this range of foodstuffs would have provided for a balanced diet of carbohydrates, protein, sugars, fats, minerals, and vitamins.

²³ cf. Cuvigny, 2000: 41, 43 for discussions on the stratification of the pay scale paid to the workers at the quarries.

A number of papyri refer to the supply of grain and fodder to the quarries. *SB* 12169 contains an acknowledgement that 2,089 artaba of barley was received at the harbor of Kaine, which was for military garrisons of the Thebaid and workers at quarries between the Nile and the Red Sea.²⁴ We are told in *P.Oxy.* XLV 3243, which is the reply of a Calpurnius Isidorus, who was a *στρατηγός* (governor) of the Themistes and Polemon districts of the Arsinoite nome, of the state of the grain supply. He tells the *praefectus Aegypti* Aurelius Septimius Heraclitus how much grain, collected during harvest, was stored in granaries or forwarded to the troops in the Thebaid and the men at Porphyrites and Claudianus. Hirt (2010: 216-217) has argued that the collection of barley and wheat for the quarry workers was likely organized similarly as the acquisition of supplies for animals by the Roman military.²⁵ In this reconstruction, the *praefectus Aegypti* would order a certain amount of barley to supply the needs of a mounted unit for one year for the entire Egyptian province. The *στρατηγοί* were informed concerning the amount of barley they were expected to supply. The authorities of the nomes would then divide this amount to be produced among the villages and the village authorities would then provide the barley. The *στρατηγοί* were also ordered by the provincial administration to appoint a board consisting of *honorationes* from the capital of the nome, who would receive an amount of money from the treasury to distribute among the villages, which contributed barley. A soldier collected the barley for his unit and the villages were

²⁴ cf. Adams, 2001: 177, 179; Mitthof, 2001: 299.

²⁵ Hirt's outline of the supply system is based on a group of texts known as the archive of Demarion, which date to the years 184-186 CE. This reconstruction of the grain supply was first put forth by Mitthof (2001).

given a receipt, which was passed on to the *στρατηγός* of their nome. The board of *honorationes* then paid the sum of the money that they received from the treasury for the village's barley contribution.²⁶

In regards to the wheat supply to the soldiers of the Egyptian desert, the papyrological evidence is scarce. *P.Oxy.* IV 735 might seem to suggest that the military units received their wheat from *dispensatores* of the provincial administration. Perhaps, taxation provided most wheat for the needs of the Roman army, and the quarry workers as well. Whatever is the case, it is appears that there were also extraneous means of acquiring high-end luxurious foods and wine as evidenced by some of the amphorae remains, which will be discussed later. Unlike food and wine, water was not imported, but collected from wells throughout the desert. Lists of water-rations preserved on ostraca show that workers received no more than 2-3 liters per day.²⁷ Military correspondences provide evidence of concerns regarding water shortages and problems associated with the storage of water.²⁸

The supply of wine is well documented in three surviving texts: Strabo, the Nicanor Archive, and the *Periplus Maris Erythraei*. Strabo (*Geog.* 752.9) writes that Laodicea provided Alexandrians with the bulk of their wine, while the Nicanor Archive, which contains a group of receipts for a family shipping firm operating from

²⁶ Pieces of this process are collected in the following papyri: *SB* 14155-62; *P.Amh.* II 107, 108; *P.Bodl.* I 14; *BGU* III 807; and also cf. Mitthof, 2001: 43, 314-317.

²⁷ *O.Claud.inv.*, 1538 & 2921, 3666. cf. Cuvigny 1997; 2005.

²⁸ *O.Claud.* 362, 380.

Coptos to the Red Sea ports of Berenike and Myos Hormos between 6 BCE and 68/69 CE, contains in its itemization Laodicean wine as having reached the Red Sea.²⁹ The *Periplus Maris Erythraei* contains a detailed account of the ports and goods in the Red Sea, the Gulf of Aden and the western Indian Ocean for traders working in Roman Egypt. In these records, Laodicean is mentioned as one of the wines sold at these ports. Tomber (1998) has suggested that a recurring group of Dressel 2-4 found in various contexts spanning from the first to early-third centuries CE at Mons Claudianus may have originated from the coastline near Laocidea and were used to transport such wine to the site.³⁰

This corresponds with the first great increase in Cilician wine production that occurred in the early years of the imperial period as the region was organized primarily as a vineyard zone in the eastern Mediterranean due to its convenient climate conditions.³¹ With these records of distribution practices in mind, I will now turn to the amphorae assemblages of Mons Porphyrites and Bir Umm Fawakhir in an attempt to draw out a possible diachronic narrative for the distribution of these amphorae and how these practices transformed over time from the first to the sixth centuries CE. Much has been made of the ostraca and papyri for providing brief glimpses of product distribution in the Eastern Desert of the empire, but the ceramic assemblages, which often are overlooked, are an important facet of the material evidence for this dispersal of goods through the networks of mines and quarries

²⁹ All of these texts are discussed more in detail by Rathbone (1983).

³⁰ Tomber (1998) argues that the Laodicean wine amphorae share similar fabric and form to Campanian amphorae, which may have led to some mistaken identification of types.

³¹ cf. Kruit-Worp, 2000 and Rauh, 2004.

situated in Egypt. There can be no assured one to one correlation between ceramic material and the good that the amphorae may have carried. The variability in the types of perishable goods that may be stored in similar amphora types and the re-use of amphorae, which has been well documented, problematize any specific connection, but there are general trends used to correlate particular categories of wine and foodstuffs with amphorae types.³²

THE AMPHORAE ASSEMBLAGES AT MONS PORPHYRITES

In order to better facilitate a discussion of the amphorae remains at both sites, I have attached an appendix of five tables, which contain detailed descriptions of the amphorae sherds found at each site and I have also created a numbering system, which allows for easy reference to specific sherds. In each table, the amphorae are grouped by their site of origin by fabric and in some cases by shape when it is relevant to the source of production. I have also created graphs in order to better visually represent the distribution of amphorae fabrics by both location and by fabric types found at both Mons Porphyrites and Bir Umm Fawakhir. **Graph 1** displays the amphorae fabrics found at Mons Porphyrites and the total count of amphorae evidence found for each fabric. **Graph 2** does the same for Bir Umm Fawakhir. **Pie Graphs 3, 4, 5, and 6** present the amphorae evidence found at Mons Porphyrites by context. **Graph 3** represents the remains from the construction of the Bradford and Foot Villages in the mid-1st century CE. **Graph 4** is the remains from the Northwest and Southwest villages from the 1st century CE to the mid-2nd century CE. **Graph 5**

³² For the re-use of amphorae cf. Callender, 1965 and Lloris, 1970.

presents the amphorae assemblage from the central fort complex, which dates from the 2nd-3rd centuries CE. **Graph 6** collects the amphorae evidence from the Ramp and Lykabettus Villages and the Badia during the 4th-5th century CE. The separation of these assemblages allows for a more nuanced and visual representation of the changes in centers of distribution for the amphorae to these sites.

The archaeological context is noted for each sherd in **Tables 1-5**, as well, to allow the reader to locate it in the larger site. A short description is also provided for each sherd modelled after Roberta Tomber and Carol Meyer in their respective pottery sections from both sites' excavation and survey reports. In cases where Tomber and Meyer discuss examples that were not published I will make a brief mention of them in the text, but they have not been included in the tables since these unpublished sherds are not sufficiently described by the authors. **Table 1** contains the amphorae collected by survey during the 1994 and 1995 seasons at Mons Porphyrites and **Table 2** is the amphorae excavated in the vicinity of the main fort complex in the Wadi Abu Ma'amel and the later fort in the Badia at Mons Porphyrites from the 1996 to the 1998 seasons. **Tables 3-5** encompass the amphorae remains from Bir Umm Fawakhir divided by the methodology used and the season in which they were collected as well. The amphorae in **Table 3** and **Table 4** were collected through survey in the 1993 and 1996-1997 seasons. **Table 5** presents the amphorae excavated from 1999 to 2001. As I discuss the fabrics, I will supply the numbers of the examples that can be referred to in these tables.

The amphorae remains collected from Mons Porphyrites and Bir Umm Fawakhir are predominantly of Egyptian fabrics from the Nile Valley³³ (**Tables 1-3: 1-37, 74-99, 108, 109, 117-126, 130**) and all but two of the Egyptian fabrics (**23, 120**) are composed of Nile silt. The predominance of Nile silt fabrics raises the question then of what goods were being transported in these amphorae to both extractive operations. The abundance of floral and faunal evidence from the sites provides an opportunity to answer this question. The floral remains at Mons Porphyrites and Bir Umm Fawakhir are suggestive of the typical crops raised in the Nile valley.³⁴ They include barley, bottle gourds, dates, doum palm fruit, grapes, olives, and wheat. The faunal remains provide a few contrasts between the sites most likely due to differences in the overall size of the population and differences in the economy of the early to mid-Roman period and the Byzantine period.

With the annexation of Egypt as a province of the Roman Empire in 30 BCE, the nature and scope of commerce at the Red Sea ports and the Eastern Desert in general dramatically changed from what had come before during the Ptolemaic period. The ports along the Red Sea that were founded during the Ptolemaic dynasty were enlarged and reinvigorated by the immense scale in trade not only throughout the Mediterranean, but extending to the distant Indian Ocean.³⁵ The

³³ J. Gates-Foster (2012: 375) notes that the fabric of Egyptian pottery is diverse within a narrow range. There are two primary categories of Egyptian clays – Nile clays, which are also known as Nile alluvium or silt, and marl clays, which are formed from the calcareous soil of the desert.

³⁴ Smith (2014:98-99) notes that all of the plant remains present at both sites are found at other Eastern Desert sites including Berenice, Mons Claudianus, Didymoi, and Myos Hormos.

³⁵ Sidebotham *et al* (2008: 176-185) details the interactions between the Egyptian Red Sea ports of Myos Hormos and Berenike and the importation of spices, pearls, and other luxury goods from India.

stability brought by Roman rule and the burgeoning trade resulted in permanent and semi-permanent markets where craftsmen and traders could gather to sell their wares.³⁶ Land routes functioned to connect the imperial mining and quarrying operations with the Nile Valley and the Red Sea ports and facilitated the movement of products and producers by allowing these separate processes to operate as a collective unit. Reaching its peak in the first and second centuries CE, the degree of monetization and complexity in the Egyptian economy was intense with the movement of goods and the exchange of coins being conducted on a large scale both internationally and internally respectively. Egypt provided the lion's share of the wheat consumed in Rome, but there was constant pressure on Egyptian agriculture because of the size of Egypt's own population and the taxation of the Romans.³⁷ Overall, this environment provided a setting in which tradesmen and craftsmen flourished.

By the third century CE though, a series of debasements in the imperial currency had undermined any confidence in the coinage.³⁸ From Diocletian onwards, the pressure on Egyptian agriculture increased exponentially while taxes consumed a larger part of the smaller surplus in the fourth century CE. The army required more men because more soldiers were dying in war than before, which along with the

³⁶ Rathbone, 2007: 717.

³⁷ van Minnen, 2000: 211.

³⁸ cf. Christiansen 2004 for a discussion of the hoard evidence from Roman Egypt in support of this argument.

scarcity of grain created a sharp drop in the population of Egypt.³⁹ These factors contributed to an increase in share-cropping.⁴⁰ Connection lines remained open between Constantinople and Egypt during the collapse of the western half of the empire and subsequent shift to the east as the central seat of power as can be seen in the papyrus documents from this period.⁴¹ Imperial officials were welcomed by locals⁴², wealthy Egyptians lived in Constantinople, and monks travelled to the capital to address property transactions.⁴³ After struggles with Persia, the small size and poor quality of the Roman garrison, a divided command structure, unstable military financing, and the loss of control of the supply lines by land through Syria and Palestine to the Arabs, Byzantine control of Egypt was severed.⁴⁴

The residents of Bir Umm Fawakhir appear to have raised goats, sheep, and cattle, which were most likely used as meat. This is supported by butchery marks found on several of the bones.⁴⁵ Notable among the faunal remains of Mons

³⁹ van Minnen (2000: 212) argues that during the fourth century beer disappears from the menu in Egypt and is suggestive of the fact that “barley had become so scarce that it was mainly used as animal fodder. Relatively more land had to be grown with wheat for human consumption than before.”

⁴⁰ van Minnen, 2000: 212.

⁴¹ Bagnall, 2010: 4.

⁴² Fournet, 1999.

⁴³ *P.Oxy.I.XIII 4397*.

⁴⁴ Bagnall, 2010: 4.

⁴⁵ Ikram (2014: 94-95) suggests that the dominant presence of goat, sheep, and cattle bones in the assemblages argues against any importation of special cuts from the Nile Valley. In support of their use as a meat supply for the laborers is the abundance of metapodials, carpals, tarsals, and phalanges, which are often discarded in the act of butchery. Their disposal also suggests that the population was well supplied with meat since in meat-poor areas the flesh from the metapodials is used and the bones tend to be used for soup.

Porphyrites is the large presence of fish bones, which is absent from Bir Umm Fawakhir. In contrast, there were a large amount of equid remains at Bir Umm Fawakhir⁴⁶ Most likely, the lack of fish remains seems to be a strategy to keep the cost low and the logistics of travel simplified and reduced in risk. The situation discussed above in reference to Mons Claudianus also appears applicable to Mons Porphyrites, which mostly likely was supplied with wheat and barley in a similar manner. Cuvigny (1996) published numerous ostraca, which detail further the distribution of the locally-produced grain. The soldiers and imperial representatives working at Mons Claudianus received a free monthly ration of one artaba of wheat, one mation of lentils, three cotyles of oil, in addition to their salaries and an annual clothing ration.⁴⁷ The local workers were supplied with one artaba of wheat and wine. This focus on local supply and consumption appears throughout the entire sequences of Mons Porphyrites and Bir Umm Fawakhir. The presence of amphorae imported from throughout the Mediterranean that allows us to study patterns in the supply and distribution to the quarries and mines of the Egyptian desert.

I will now proceed to lay out the specific contexts and fabrics that compose the amphorae corpus from both sites and situate them in the larger picture of amphorae production throughout the second to seventh centuries CE. The ceramic evidence at Mons Porphyrites shows an early concentration of quarrying activity around the Bradford and Foot Villages in the northern portion of the site. The

⁴⁶ "A significant amount of the meat supply is from equids, mainly donkey...Marine fish and shellfish were major components of the diet, providing additional high quality protein, vitamins, and minerals. A few Nile fish are also present. The majority of the fish remains are of the parrot fishes (from the Red Sea)." (Hamilton-Dyer, 2001:160).

⁴⁷ O. Claud. Inv. 8497.

construction of these two settlements has been given a date range of the early- to mid-first century CE.⁴⁸ The Bradford Village (fig. 4) consists of seven structures or huts that sit high on a steep slope, which faces west over the Wadi Abu Ma'amel (Maxfield and Peacock, 2001: 58). It was in Hut 1 that the dedication by Gaius Cominius Leugas was discovered, which suggests a Tiberian date. The amphorae remains at the Bradford Village are mostly from the Nile Valley (**15-18**), but it should be noted that one Tripolitania I amphora base was collected from structure 4 (**40**). Tripolitania I amphorae are usually thought to have held olive-oil and are typically given a date range of the first to fourth centuries CE (Panella, 1977a). The Foot Village (fig. 5) consists of sixteen structures or huts and is located at the foot of the mountain slope west of the Bradford Village. A Tiberian inscription and the associated pottery give this site a similar date to the Bradford Village. The Foot Village is similar to the Bradford in that again there is predominantly amphorae consisting of Nile Valley fabric (**19-23**) with one exception (**66**). All of the amphorae except one (**23**) from the Nile Valley are composed of a silt or a silt mixture.⁴⁹ It appears possible that during this early period of quarrying at the site, the work was performed on a relatively small scale with the supply of food for the laborers concentrated on local goods. The date range for the Tripolitania I amphora base and its location on the surface allows for the possibility that it was deposited in the Bradford Village later as well. The ceramic evidence in conjunction with the

⁴⁸ Another important factor in establishing these villages as the first phase of occupation is the presence in one of the huts at the Bradford Village of the dedication by Caius Cominius Leugas discussed earlier (Maxfield and Peacock, 2001: 60-61).

⁴⁹ "Nile silt clays appear throughout the Nile river valley, while marl clays occur at locations along the river between Esna and Cairo and in secondary deposits such as at Wadi Quena," (Bourriau et al., 2000: 121-122).

inscriptions from the Tiberian period seems to correspond with these two areas being the origins of exploitation at the site.

It appears that during the same period of time or shortly after, two new villages were established, which are now called the North-West and South-West Villages. The North-West Village (fig. 6) is situated north-west of the Foot Village and lies on terraces cut back into the land at the upper end of a ravine. The settlement's layout is much more complex than the previous two villages and contains numerous buildings and a plaster-lined cistern. The ceramic material recovered from the area dates from the mid-first to the mid-second century CE. Once again, imported amphorae are not common except for a single Cilician wine amphora and a possible body sherd of a North African vessel.⁵⁰ Tomber (2001: 274) notes again the dominant presence of Egyptian amphorae.⁵¹ It is in the South-West Village (fig. 7) that we begin to see an increase in amphorae remains that were imported from throughout the Mediterranean. It should be noted though that it appears the South-West Village continued in use until the late second to early third centuries CE and this likely had an impact on the assemblage of increased imports collected by survey. The South-West Village lies at the southern-most point of the site and is unique among the other settlements in that it lies on low ground and is separate from the quarries that the inhabitants of the village worked (Maxfield and Peacock, 2001: 86). There appears to be two phases of occupation at the site, but the ceramic remains point to a much more intense period of occupation during the

⁵⁰ Tomber (2001: 274) chose not to illustrate either of these vessels or provide a description and therefore has also been excluded from my table due to a lack of detail.

⁵¹ See footnote above for these Egyptian amphorae as well.

late first to mid-second century with perhaps a short period of activity during the second structural phase, perhaps to accommodate the focus of activity around Lykabettus during the fourth century exploitation of the quarries (Maxfield and Peacock, 2001: 103-104). The amphorae found in the South-West Village stand in contrast with the assemblages that have been discussed so far. The presence of Egyptian amphorae (**24-27, 37**) is overshadowed by the influx of fabrics from throughout the Mediterranean. Two Cilician rims (**55,56**) were found as evidence of the possible importation of Cilician wine. Amphorae from Campania, the north-west coast, and unidentified sources (**67-70**) all support an increase in the importation of luxurious foods and drink to the site at least by the mid-2nd century CE as the workforce involved in the extraction of the porphyry increased.⁵²

Possibly corresponding chronologically with the South-West Village, the central fort (fig. 8) in the Wadi Abu Ma'amel was built sometime in the late first to mid-second century and appears to have been most intensely occupied from the second to early third centuries CE. It is during this concentrated period of occupation at the fort that there seems to have been the largest presence of workers at these quarries. The fort contains a number of distinct features. Its southern end is dominated by a large plaster-lined tank that served as the main water-storage facility. Further to the south are a series of rooms in which two lever mills were discovered suggesting possible bread-making activities. North of the large tank room

⁵² Again, the Campanian Dressel 2-4 amphorae and the north-west coast fabrics are not given a detailed treatment by Tomber, so they also have been excluded from the tables. The Campanian Dressel 2-4 is typically associated with the importation of wine (Panella, 1977b). The north-west coast fabrics usually are thought to have contained fish products and olive-oil (Peacock, Bejaoui, and Belazreg, 1990).

lies a structure with a row of clay ovens, which may have been the main kitchen and refectory. The eastern side of the fort is composed of a jumbled complex of various rooms while to the north lies a large open courtyard. The fort appears to have been remodeled at various times. It was extended eastwards with the construction of new rooms and a much stronger wall than was there previously.⁵³ The fort complex also consisted of a number of structures situated around it. These included a possible bathhouse, a temple to Isis, a necropolis, a temple to Serapis, a temple to Isis Myrionomos, and a scattering of wells, which all share a similar date range with the fort.

The amphorae collected through both survey and excavation at these sites show intensive activity of importation from throughout the Mediterranean from the second to third centuries CE. Egyptian amphorae (**1-14, 74-85, 89, 90, 94, 96, 97**) still compose most of the assemblages, but there is a much higher percentage of other amphorae types during this period than any other. It should also be noted that the fort was the focus of excavation activity along with the Badia from 1996 to 1998 as well as the earlier surveys, so the amount of material recovered is much more heavily concentrated at these two sites. Throughout the central complex there are remains of Cilician Dressel 2-4 (**102**), Gaulish ware (**38**), Tripolitania I (**39**), North African ware (**44, 45**), LR 1 from Cilicia or Cyprus (**104**), LR3 from Asia Minor (**59, 105**), LR4 from Gaza (**60, 106, 107**), and Italian (**100**) and Aegean fabric (**101**). As has been stated, the Cilician Dressel 2-4 has typically been associated with wine

⁵³ Maxfield and Peacock (2001: 13) suggest this new wall may have been in response to the flash floods, which are all too devastating in the eastern desert.

and the Gaulish amphora (38) also seems to have been associated with a flourishing wine industry in this area (Laubenheimer, 1985). The contents associated with LR3 from Asia Minor (59, 105) are unknown (Lang, 1955), while the LR4 from Gaza (60, 106, 107) appears to be associated with the transportation of wine (Riley, 1979). The Schörendorfer 558 (100) from Northern Italy is one of three sherds of this type at the site, of which only one was published. It possibly held olives. The hollow-foot amphora sherd (101) likely functioned as a wine container (Tomber, 2007: 204-205). There are also a number of unidentified imported amphorae found on site, of which only one was published (65), as well as unpublished examples of Campanian and Rhodian amphora. The variety of amphorae remains appears to correspond with the growth in architecture throughout the site. During the second and third centuries, the site experienced exponential growth in the workforce and had the ability to obtain goods from a variety of distant locales. Rome was controlling most of the Mediterranean and was able to successfully supply these extractive operations continuing the fruitful exploitation of these resources.

While the central fort complex was at its peak, it appears that the South-West Village was abandoned and the area composed of the Ramp Village and the Lykabettus Village began to be developed. During the late third century, it appears that activity declined and may have completely ceased at the site for a short time. As argued earlier, the numismatic evidence is absent for this time period and if we examine the historical record, it is during the late third century that imperial control was loosened with the loss of Egypt to the Palmyrenes in the early 270s. This would

have interrupted the processes of extraction and trans-desert transport until Aurelian defeated Zenobia and Vaballathus in 272 CE (Maxfield and Peacock, 2007: 422).

Activity quickly resumed from the fourth to fifth centuries, but became much more focused on the southern ends of the mountain range. The Ramp and Lykabettus Villages became sites of heavy activity, but it appears that the central focus was around a new fort in the Badia. The scale of importation was still significant, but shows a slight decrease in variety when compared to the second and third centuries. I believe if we juxtapose the remains of the Badia complex and the Ramp and Lykabettus Villages with the central fort complex occupied most intensely in the third century CE, we can establish that the scale of importation was quite diminished.

The Ramp Village, occupied in the 4th-5th centuries CE, rests on the floor of the wadi between the South-West Village and the central fort in the Wadi Abu Ma'amel (fig. 9). It is built against the rock face where the wadi side rises steeply (Maxfield and Peacock, 2001: 104). Roman-era amphorae are scattered throughout and are mainly composed of Nile fabrics (**28-31**) with some North African (**46-51**). There are also two Tripolitania I amphorae sherds (**41, 42**), but as noted they may be associated with the earlier phases of the site. One LR1 (**57**) was found as well suggesting possibly some importation of wine, but otherwise the Ramp Village's amphorae consist mostly of Nile fabrics suggesting local supply for the labor force. This would make sense considering the preceding events. Not only was Roman control of Egypt loosened in the end of the third century CE, but also the ports located along the Red Sea went into decline. The archaeological evidence suggests

that Myos Hormos ceased operations at the end of the third century CE and Berenike, which had been prosperous during the first and second centuries CE, only resumed activity in the mid-fourth to fifth century CE.⁵⁴ The same conclusions can be drawn from the nearby Lykabettus Village, but another interpretation is completely feasible (fig. 10). The variety of imported amphorae present in the Lykabettus Village is also a possible result of the earlier working of the area, but could also perhaps represent significant importation of foods and wine from a variety of sources. The presence of LR1 (**58**), LR4 (**61, 62**), and unidentified imports (**71-73**) plus an unpublished handle of a hollow-foot amphora from the Aegean could be used to argue either interpretation. The village consists of a series of buildings and a small cemetery situated on an exposed ridge east of its associated quarry sites. Terraces were cut back into the hillsides and revetments were built to retain the down-slope walls of buildings and to hold back scree from the mountain side (Maxfield and Peacock, 2001: 111).

The Badia fort complex (fig. 11) contains material finds that resemble the assemblages at the Ramp and Lykabettus Villages. An extensive amount of Egyptian amphorae (**35, 36, 86-88, 91-93, 95, 98, 99**) was recovered from the area, which again points to a localized focus for supply, but there still remains amphorae sherds from farther abroad such as Tripolitania I (**43, 103**), LR4 (**63, 64**) and North African (**52-54**). The amphorae collected from the Badia complex pales in comparison to the variety present at the central fort complex and shows a much

⁵⁴ cf. Peacock and Blue, 2006 for more on Myos Hormos and Sidebotham and Wendrich, 1995, 1996, 1998, 1999, 2000 and 2007 for more on Berenike.

smaller scale operation as the Roman empire began to fragment and its center of power shifted to the east. By the middle of the fifth century, it seems that the site's function as a quarry ceased and this is attested by the absence of numismatic, epigraphic, and literary evidence. It is certainly possible that small scale activity at the site continued intermittently, but further research is required to validate this claim. Porphyry continued to be used frequently by the Holy Roman Emperor and the Christian Church, but it appears that most if not all was the reuse of already extracted stone, which was cut down into smaller artifacts or inlays (Maxfield and Peacock, 2007: 427).⁵⁵

In summary then, the amphorae remains present us with a narrative of activity at the site by not only providing a chronology of the opening and closing of workings at the quarries, but also presenting an informative picture of the increase and decline of exploitative activities in conjunction with the rise and fall of importation of goods to the site. The Bradford and Foot Villages were associated with the earliest centers of concentration of quarrying activity from the early-to-mid-1st c CE. Most of the amphorae remains are of Nile silt demonstrating a localized supply network for feeding the labor force. The size of the labor force was relatively small when compared with the population inhabiting the area in the second to third centuries CE.

⁵⁵ Anna Comnena, in her description of *porphyra*, refers specifically to the salvaging of Rome for porphyry in the *Alexiad* 7.2: "This purple room was a certain building in the palace shaped as a complete square from its base to the spring of the roof, which ended in a pyramid; it looked out upon the sea and the harbor where the stone oxen and lions stand. The floor of this room was paved with marbles and the walls were paneled with it but not with ordinary sorts nor even with the more expensive sorts which are fairly easy to procure, but with the marble which the earlier Emperors had carried away from Rome. And this marble is, roughly speaking, purple all over except for spots like white sand sprinkled over it. It is from this marble, I imagine, that our ancestors called the room "purple."

At some point in the mid-1st c CE, the North-West and South-West Villages were built to focus activity on new sections of stone. While the size of the work force increased, the food supply remained relatively localized still with most amphorae of Nile silt. Importation increased in the second century CE and achieved its greatest quantity from the late-2nd to early-3rd c CE with the construction and heavy occupation of the central fort.

Activity ceased in the South-West Village in the early-3rd c CE as focus moved to the area near the newly built Ramp and Lykabettus Villages. The interruption of Rome's hold on Egypt at the end of the third century CE brought an end to the activities at the site, which were not resumed until the fourth century and continued until the fifth. A new fort, the Badia, was built, but with the closure of Myos Hormos, the scale of importation to the site declined considerably when compared with the activity of the third century CE. The changes in amphorae distribution to the site is recorded in **Graphs 3, 4, 5, and 6**.

THE AMPHORAE ASSEMBLAGES AT BIR UMM FAWAKHIR

Shifting now to our other site for comparison, the settlement at Bir Umm Fawakhir appears to have been established around the same time as the activities at Mons Porphyrites were ceasing for the final time. It has already been stated that there was almost certainly activity in the region of the Wadi Fawakhir during the Twentieth Dynasty of the Pharaonic period and probably intermittent activity throughout the periods between its recoccupation in the Byzantine period.⁵⁶ The

⁵⁶ During the pharaonic period, it appears that the mines in the Wadi el-Sid were worked by special expeditions that stayed only as long as needed to obtain the metal (Meyer, 2011: 179).

settlement itself appears to have been a single site and the remains have never been reworked, demolished, built over, or scraped into trenches or fill (Meyer, 2011: 177). It appears to have been occupied for a period of 150 years or so, in which it was abandoned several times, perhaps, only reopened as the need for gold compelled the government to subsidize the work (Meyer, 2011: 179). The working of these gold mines suggests that such a difficult operation still required a large, organized, and well-supplied labor force. Meyer *et al* (2000: 15-17) estimates a population of a thousand or so people living at Bir Umm Fawakhir.

The masses of pottery at the site consists of wares and forms attested at Thebes, Aswan, and elsewhere in the Nile Valley, with little Oasis ware, African Red Slip, and a few pieces of handmade Eastern Desert Ware (Meyer, 2011: 178). Amphorae are very common at Bir Umm Fawakhir or 'Well of the Mother of Pots', but they represent only a few types. The most common of the imported amphora types is LR1 (**110-115**) from Cilicia, which again is usually associated with the transport of wine. There are also examples from Tunisia (**116, 131, 132**), Palestine (**129**), and possibly Asia Minor (**127, 128**). The predominance of Cilician amphorae seems to correspond with the date range (4th-6th centuries CE) proposed by Meyer for the occupation of Bir Umm Fawakhir. The examples from Tunisia also support this date and appear to be Keay type 55 Tunisian amphora, which have a date range of the end of the fifth century to the first half of the sixth. The lack of any western amphorae sherds demonstrates a shift to strictly eastern production sites to supply extraction activities in the desert.

Unfortunately, the discussion by Meyer on the amphorae remains are strictly focused on the imports and no account is made of the number of local amphorae beyond the cursory acknowledgement that the corpus is mostly composed of Nile Valley fabrics.⁵⁷ Similar to Mons Porphyrites, the majority of the fabrics are of silt, while only one example is of marl (**120**). Only one sherd, that of an LR7 (**130**) is treated with any detail. The importation of wine certainly appears to be the primary use for amphorae at the sites, if the remains are representative of each vessel's primary usage and are not examples of reuse. The luxuries of Mons Porphyrites are absent from Bir Umm Fawakhir. The items available to people laboring in the mines is confined to necessities rather than indulgences from throughout the Mediterranean allowing, of course, for wine. In the absence of data for locally produced amphorae, it still seems plausible that grain and wine carried in local Nile Valley fabrics were mostly supplied from local sources. I also note the possibility of gardens in the Wadi Fawakhir, which are recorded in published ostraca from the region a hundred years or so earlier.⁵⁸ Perhaps there was a continuation of such practices to help supplement the food supply for the workers and their families.

Building 93 (fig. 12) was one of three chosen for excavation and revealed two Tunisian amphora sherds (**131, 132**) and one LR5 (**129**). The building is representative of the type of agglomerated structures that make up the site, which Meyer believes to be household units. Perhaps, these sherds were originally

⁵⁷ I am unable to make any further assertions about the local amphorae because there is a severe lack of published evidence. While it is understandable that not everything may be published, Meyer's focus on the imported amphorae skews her representation of the amphorae fabrics found at Bir Umm Fawakhir. I have attempted to represent the evidence, which she has supplied while also making sure to take into account the biases shown in her report.

⁵⁸ *O. Fawakhir* 14 = SB VI 9017.

transported to the site containing wine or foodstuffs before possibly remaining as storage containers in a domestic context. The associated assemblages of ceramic and material remains seems to accord with this interpretation of building 93 as a domestic structure (Meyer, 2011: 17). The other two buildings selected for excavation did not contain any imported amphorae.

In summary, Nile silt is the predominant material present in the amphorae remains at the site and presents a similar scenario as Mons Porphyrites and Claudianus. When possible, local goods were brought in to feed the workers at the sites. While evidence of wheat is sparse in the botanical record at Bir Umm Fawakhir, it is possible that bread was shipped to the town as loaves.⁵⁹ Meyer (2014: 135) posits that basic grains and staples carried in from the Nile valley may have been supplemented by locally grown vegetables.⁶⁰ Wine was a staple and its presence at Bir Umm Fawakhir is amply supported by the amphorae remains. Wine appears to have been brought into the site from Cilicia, Tunisia, Asia Minor, and North Africa. Bir Umm Fawakhir also benefitted from its location, which helped the ease of importation to the site. The location of the site along the trans-desert route between Myos Hormos and Coptos ensured the transport of goods to and from the site was protected and was greatly facilitated.⁶¹

⁵⁹ Guéraud (1942: 153-156) records that Roman-period Fawakhir ostraca mention fifteen and six loaves of bread on one occasion and salt for bread-making on another.

⁶⁰ Roman-period ostraca from Persou, Maximianon, and Krokodilô refer to vegetables such as asparagus, turnips, lettuce, cabbage, leeks, radishes, beets, beans, purslane, pennyroyal, endive/chicory, dill-seed, basil, and saffron as being sent from Persou to other desert stations (Bülow-Jacobsen, 2003: 420-421).

⁶¹ The site also benefitted from earlier mining and quarrying operations in the area, which led to the creation of this major transportation artery (Sidebotham, Hense, and Nouwens, 2008: 221).

CONCLUSION

The provisioning of food and drink to the Eastern Desert required an intense system of transportation and distribution in order to supply workers in these harsh regions. With the annexation of Egypt as a province of the Roman Empire in 30 BCE, the nature and scope of the international commerce that landed at Red Sea ports and that traversed the Egyptian desert changed dramatically (Sidebotham *et al*, 2008: 177). Ports along the Red Sea that were founded in the Ptolemaic era were expanded and reinvigorated by the new expansive trade with distant lands. Besides authors such as Pliny who discuss the great increase in trade during the imperial period, we have the Tamil poems such as the *Pattinappaalai* (2.199-212) that recount how the rulers imported palace guards and maidens from the *Yavanas* (westerners) and were particularly fond of wines from the Mediterranean and Aegean. The *Periplus of the Erythraean Sea* records that south Arabian and Indian rulers desired wines from Laodicea and the Aminaeon variety from Italy. Ostraca from Berenike also mentions the exportation of Laodicean and Aminaeon wines, as well as vintages from Rhodes, Euboea, Ephesus, and Kolophon (Sidebotham *et al*, 2008: 179-180).

The ostraca recording the trading activity of the Nikanor family from Coptos present us with a family's interest over several generations. Rather than participating in the larger-scale importation and exportation of goods across the Mediterranean, they seem to have worked with mundane cargoes. Rostovtzeff (1931: 23-26) originally argued that these cargoes were intended for trade with the east. Whereas Ruffing (1993) and Young (2001: 64-65) have argued that these items which

consisted of local products such as grain, wine, barley, chaff and other such staple goods were intended to provision the inhabitants of the Red Sea ports. Rather than simply being one or the other, the Nikanor operation should be viewed within a complex system of trade that took place alongside of provisioning local groups. The supply of communities living at the Red Sea ports organized the transportation of supplies through channels, which had been developed with Koptos and the Nile Valley. Soldiers who were based at the ports would have been supplied in the same way as those based at the Eastern Desert quarries and the stations on the routes throughout the desert.⁶² The importance of this is that we are presented with different levels of trade on a continuum that most likely was in place for the supplying of these quarrying and mining sites in the Eastern Desert. For those not faint of heart, trade was an enterprise in which one could make a fortune, but it came with great risks in the forms of bandits and shipwrecks. These smaller, regional markets operated in conjunction with the larger framework of the Roman imperial supply networks to provide the laborers with the needed sustenance to continue the process of resource extraction.

During the peak period of activity at Mons Porphyrites, Rome was capable of supplying its extraction and military sites with goods from throughout the empire. The interruption of quarrying at the site appears to coincide with the loss of the control of Egypt in the 270s CE before activities resumed on a smaller scale in the fourth and fifth centuries CE. As the empire split into eastern and western centers of power in the years after Constantine, wars and invasions reduced this network of

⁶² Adams 2007: 225.

importation and exportation among the provinces. Byzantine quarrying and mining activities were generally supplied by eastern sources while still maintaining a focus on local production when possible in order to reduce the cost of these operations. Bir Umm Fawakhir also presents us with the possibility that these activities of mining and quarrying were performed intermittently, perhaps, influenced by the political climate, the natural elements, a shortage in materials, or a combination of the three. The amphorae present at both Mons Porphyrites and Bir Umm Fawakhir provide a rare glimpse into the production and distribution of imported goods for these resource extraction projects that is woefully understudied. Further excavation and collection of data at both sites is necessary to further understand the intricacies in these patterns of distribution and their connections to the sites of production of the amphorae.

TABLES

Table 1. Amphorae from Mons Porphyrites – Survey 1994-1995. Organized by the amphora’s site of origination. (Modified from Tomber, 2001)

Number	Site of Origination	Context on Site	Description
1	Egyptian	Central Fort (South-West Sebakh/Gate)	In-splayed ribbed walls and enlarged rim, slightly grooved on top. MC Amphora 11. Fine silt. Brown throughout, pitched inside.
2	Egyptian	Central Fort (East Sebakh)	Upright rim, enlarged inside and with a neck cordon outside. Calcareous-rich silt, possibly north-west coast. Orange-red with brown core; red-brown inside surface, outside green-cream residue.
3	Egyptian	Central Fort (East Sebakh)	Enlarged rim, grooved on the inside. Two rims, joining. Coarse silt, possibly north-west coast. Red-orange throughout.
4	Egyptian	Central Fort (Interior)	Small, tapered, solid base. Fine silt with occasional limestone to c. 1.0 mm. Brown with grey-brown core and red-brown external margin and pitted surfaces.
5	Egyptian	Central Fort (Interior)	Solid, poorly shaped spiral with knob base. Fine silt with rare quartz inclusions to c. 0.5 mm. Brown throughout.
6	Egyptian	Temple of Isis	Plain rim, bevelled internally, and externally delineated by a groove on the long, narrow neck; ovoid handles are joined to the lower neck. Secondary burning inside. Fine silt, brown throughout.
7	Egyptian	Temple of Isis	Sloping, ribbed shoulder and handle scars. Fine, slightly sandy silt. Brown to red-brown with brown outside surface.
8	Egyptian	Temple of Isis	Base, ridged around the lower half. Dense silt with occasional fine limestone inclusions (<0.5 mm) and some organic voids. Orange-brown with thick dark grey core and brown surfaces.
9	Egyptian	Workers’ Village	Heavily twisted or squeezed solid spike, terminating in a very narrow vessel base. Secondary burning in part. Fine silt. Brown with organic impressions on the surface.

10	Egyptian	South Sebach	Enlarged, in-turned, triangular-shaped rim; irregular handles are joined to the neck. Fine silt with occasional organic and fine limestone inclusions, <0.5 mm. Brown inside surface; brown-red outside, although abraded in part, with grey-green core.
11	Egyptian	Necropolis	Dressel 2-4 with poorly defined rim. Double-rod handles with thumbing marks forming a carination. MC Amphora 28. North-west coast. Light brown throughout.
12	Egyptian	Serapis Temple	Grooved rim and deeply ribbed neck; ovoid handles are joined to the rim and neck. MC Amphora 12. Fine silt. Brown throughout.
13	Egyptian	Isis Myrionomos	Over-turned rim, grooved internally. Sandy silt with occasional limestone, < 0.5 mm. Brown with red-brown surfaces and margins.
14	Egyptian	North Well	Grooved, bead rim. Coarse silt with occasional limestone to c. 1.0 mm. Red-brown with brown-grey core and brown surfaces.
15	Egyptian	Bradford Village (Structure 1b)	Plain, in-turned rim; round handles are joined to the base of the rim and neck. MC Amphora 1, variant. Very hard-fired silt. Red-brown throughout, apart from orange margins.
16	Egyptian	Bradford Village (Slipway)	Flattened, almond-shaped rim, and wheel marks on the wall; round handles are joined to the wall. MC Amphora 1, variant. Three rims, one handle, joining. Coarse, sandy silt with occasional clay pellets, black iron-rich inclusions and limestone to c. 1.0 mm. Light brown to pink-brown with light brown surfaces.
17	Egyptian	Bradford Village (Slipway)	Round, almond-shaped rim, slightly in-turned. MC Amphora 1. Fine silt with rare visible quartz. Brown throughout with occasional red-brown mottling on the outside surface.
18	Egyptian	Bradford Village (Slipway)	Ribbed neck and grooved rim, oriented slightly higher on the inner surface; handles are joined directly below the rim and upper shoulder. The wall is pierced

			directly above the lower handle join. MC Amphora 12. Poorly mixed silt. Brown with orange margins and brown inside surface; red-brown outside.
19	Egyptian	Foot Village	In-turned, almond-shaped rim; round handles are joined to the neck and upper shoulder. Faint wheel marks on the walls. Three rims, one handle, joining. MC Amphora 1, variant. Silt or mix with sparse to common inclusions of fine limestone, quartz, and red-brown iron-rich inclusions to c. 0.5 mm. Possible a mixed clay or north-west coast. Dull, pale brown throughout.
20	Egyptian	Foot Village	In-turned, almond-shaped rim; round handles are joined below the rim. Faint wheel marks on the walls. Four rims, joining. MC Amphora 1, variant. Fabric is same as 19.
21	Egyptian	Foot Village	Enlarged, almond-shaped rim; ovoid handles are joined below the rim. MC Amphora 1. Silt with rare fine limestone and sand-sized quartz. Dull, pale brown throughout.
22	Egyptian	Foot Village	In-turned, almond-shaped rim. MC Amphora 1, variant. Hard silt with elongated organic voids. Orange margins with thick grey core and red-brown surfaces, discolored to brown in part.
23	Egyptian	Foot Village	Grooved handle. MC Amphora 27. Marl with sparse and sand-sized quartz and common fine limestone. Dull brown with pale orange margins and cream surfaces.
24	Egyptian	South-West Village	In-turned, almond-shaped rim; handles are joined to the base of the rim and neck. A small hole is pierced on the wall near the upper handle join. MC Amphora 1, variant. Sandy silt. Red-brown with some brown lensing and brown surfaces.
25	Egyptian	South-West Village (Pottery Dump)	Almond-shaped rim; round handles are joined below the rim and to the wall. MC Amphora I, variant. Fine, slightly sandy silt with occasional clay pellets and limestone. < 0.5 mm. Red-brown to pink with generally brown or discolored surfaces.

26	Egyptian	South-West Village (Area C)	Bead rim. MC Amphorae 26-8. Silt or silt and marl mix with calcareous and grey inclusions. North-west coast. Light brown or tan-buff silt with burnt and/or discolored surfaces.
27	Egyptian	South-West Village (Main Road)	Enlarged, in-turned rim and grooved lower rim; ovoid handles are joined to the rim. Two rims, joining. Sandy silt with some calcareous and grey inclusions to c. 1.0 mm. Red-brown with slightly browner surfaces.
28	Egyptian	Ramp Village	Flattened bead rim; round handles are joined below the rim. Fine silt with elongated organic voids. Red-brown with brown surfaces, occasionally to dark brown.
29	Egyptian	Ramp Village	Gently carinated shoulder and ribbed walls; sub-rounded handles are joined to the neck and shoulder. Fine silt. Red-brown with brown surfaces.
30	Egyptian	Ramp Village	Solid, knobbed amphora base. Hard-fired silt with occasional limestone inclusions, < 0.5 mm. Pink-brown internal margin, brown external margin and brown to red-brown surfaces.
31	Egyptian	Ramp Village	Bead rim and curved neck; round handles are joined directly below the rim. Fine silt. Pink-brown with red-brown surfaces.
32	Egyptian	Lykabettus Village	Flattened bead rim. Silt. Red-brown with grey-green core and brown surfaces.
33	Egyptian	Lykabettus Village	Rounded, ribbed shoulder; round handles are joined to the neck and shoulder. Fine silt with rare organic voids on the surfaces. Brown to orange-brown with brown to discolored surfaces.
34	Egyptian	Lykabettus Village	Internally bevelled, undercut rim. Sandy silt. Brown with light-grey core and brown to brown-red surfaces.
35	Egyptian	Badia (Fort Complex)	Slightly grooved bead rim and long, straight neck. Fine silt with common organic voids. Brown throughout with heavily pitted surfaces.
36	Egyptian	Badia (Animal Lines)	Tapered bead rim. Fine silt. Brown-red throughout.

37	Egyptian (Aswan)	South-West Village (Area C)	Bead rim. MC Amphora 36. Pink with matt red-brown slip outside and on the rim.
38	Gaul	Central Fort (North Sebahk)	Footring base. MC Amphora 40. An earlier typological development of the form, before the late second and likely first century CE. Fine, micaceous fabric. Cream throughout.
39	Tripolitania	Central Fort (North Sebahk)	Rim fragment. Most commonly dates to the first century into the fourth. Fine, inclusionless fabric. Pink-buff with cream surfaces.
40	Tripolitania	Bradford Village (Structure 4)	Tripolitania I base. First through fourth century, more common after the mid-second. MC Amphora 45. Fine, silty fabric with moderate calcareous inclusions, including microfossils, < 0.5 mm. Red with thin grey-brown and buff inside margins; surfaces red-brown. Vertical finger wipings on the hollow base spike.
41	Tripolitania	Ramp Village	Over-turned molded rim and lid seat. Clean clay matrix with rare silver mica and moderate, well-sorted quartz and iron-rich inclusions to c. 0.5 mm. Cream with pinker inner marginal surfaces slipped white to yellow.
42	Tripolitania	Ramp Village	Large bead rim and flattened lip. Moderate quartz inclusions to c. 0.5 mm in a clean clay matrix. Light pink with white-yellow surfaces.
43	Tripolitania	Badia (Fort Complex)	Large bead rim, lipped on the top. Fine matrix with occasional quartz and limestone inclusions to c. 0.5 mm. Pink-brown with cream outside surface and rim top.
44	North African	Central Fort (Interior)	Flattened rim, bevelled internally. Fine, slightly sandy calcareous clay with occasional fine limestone inclusions to c. 0.5 mm. Orange-buff with buff-yellow outside surface, abraded on the rim top.
45	North African	South Sebahk	Wide mouth and undercut rim. Two rims, joining. Well-sorted, abundant quartz (< 0.5 mm) in a clean clay matrix with occasional limestone inclusions, including

			surface eruptions to 1.0 mm. Pink-buff with cream outside surface.
46	North African	Ramp Village	Thickened rim, bevelled internally; flattened, grooved handles are joined to the base of the rim. Dense fabric with small, < 0.5 mm, white quartz and clay pellets, and occasional ill-sorted limestone to c. 1.0 mm. Brown inner break; medium grey external margin with white slip over an orange surface, resulting in cream-brown surfaces outside and inside on the rim.
47	North African	Ramp Village	Handle, slightly grooved. Uncertain type. Calcareous, silty clay with occasional larger ill-sorted quartz inclusions. Pink with white or cream surfaces, abraded inside.
48	North African	Ramp Village	Rounded, over-turned rim. Fine clay with well-sorted, moderate quartz to c. 0.5 mm. Light orange with red-brown surfaces.
49	North African	Ramp Village	Over-turned rim. Fine, slightly sandy fabric with occasional calcareous inclusions, < 0.5 mm. Light pink-orange with cream surfaces, pitted inside.
50	North African	Ramp Village	Thickened, out-turned rim. Fragmentary. Hard, sandy fabric with quartz usually to c. 0.5 mm. Light brown with light brown margins and light brown surfaces.
51	North African	Ramp Village	Squared-off, bead rim and internal bevel; handle scar on the neck. Four rims, three joining. Fine, silty fabric with occasional limestone inclusions to c. 0.5 mm. Orange-brown with slightly duller inside surface; cream outside and on the rim top.
52	North African	Badia (Fort Complex)	Poorly finished in-turned bead rim. Fine, sandy fabric with rare very fine (< 0.1 mm) calcareous inclusions. Orange-brown throughout.
53	North African	Badia (Animal Lines)	Plain rim. Fine, sandy fabric. Pink-brown with white-green surfaces outside and on the rim top.
54	North African	Badia (Fort Complex)	Over-hanging, molded rim. Fine inclusionless matrix with rare limestone inclusions to c. 1.0 mm. Brown-pink with

			cream-green surfaces outside and on the rim top.
55	Cilicia	South-West Village (Area C)	Dressel 2-4. Squared-off rim. MC Amphora 55. Fabric variant with sparse quartz. Buff to light brown throughout.
56	Cilicia	South-West Village (Main Road)	Dressel 2-4. Concave, club rim. MC Amphora 55. Fabric variant with moderate quartz. Pink-buff throughout.
57	LR1 (Cyprus or Cilicia)	Ramp Village	Bead rim and handle scars on the neck; the join for the body is visible on the inside neck. Buff throughout.
58	LR1 (Cyprus or Cilicia)	Lykabettus Village	Handle. Light orange-brown throughout.
59	LR3 (Asia Minor)	Central Fort (West Sebakh)	High-footed base. Continues from early Imperial series into the fourth century. MC Amphora 54. Red-brown throughout.
60	LR4 (Gaza)	South Sebakh	Undercut, lid-seat rim and abraded shoulder, possibly originally covered with clay accretions. Fine, tan-red fabric.
61	LR4 (Gaza)	Lykabettus Village	Bead rim, grooved shoulder and loop handles. Two rims, joining. Surface grey-brown discolored to cream and red-brown.
62	LR4 (Gaza)	Lykabettus Village	Internally bevelled rim and grooved upper shoulder; remnants of clay accretions are visible on the neck. Orange with dull surfaces.
63	LR4 (Gaza)	Badia (Fortified Rock)	With lid-seat rim. Discolored from secondary burning.
64	LR4 (Gaza)	Badia (Fort Complex)	Rounded rim and clay accretions on the shoulder. Orange-brown with grey-brown core and brown-red surfaces.
65	Imported	Central Fort (Interior)	Flat rim, stepped to the shoulder. Clean clay matrix with common sand inclusions to c. 0.5 mm. Buff throughout.
66	Imported	Foot Village	Squared-off rim, grooved on the outside and internally bevelled. Fine, calcareous clay containing rare silver mica and common well-sorted, sand-sized quartz and red iron-rich inclusions; rare limestone to 1.0 mm is also visible. Buff-green with yellow-cream outside surface, discolored inside.

67	Imported	South-West Village (Area C)	Dressel 2-4. Square, slightly abraded rim. Sparsely micaceous fabric with calcareous clay and irregular multi-colored, although mainly dark, volcanic inclusions to c. 2.0 mm. Discolored buff to buff-green throughout.
68	Imported	South-West Village (Main Road)	Dressel 2-4. Well-rounded, slightly undercut bead rim and splintered handles. Very fine, calcareous fabric with occasional white, grey, and red inclusions to c. 0.5 mm. Orange-buff with patchy, cream outside surface.
69	Imported	South-West Village (Main Road)	Undercut bead rim; handle scars on the wall. Very fine, calcareous fabric with occasional clay pellets, sometimes red, to c. 0.5 mm. Pink-buff throughout.
70	Imported	South-West Village (Building B1)	Large bead rim; handle scar below the rim. Fine clay with moderate small quartz and rare red inclusions. < 0.5 mm. Buff throughout.
71	Imported	Lykabettus Village	Bead rim, straight neck, sharply everted shoulder and ribbed walls; irregular handles are joined to the neck and upper shoulder. Fine clay with common small angular white inclusions, and common red pellets and white inclusions to c. 1.0 mm. Light orange to pink throughout.
72	Imported	Lykabettus Village	Inturned rim, grooved outside; handle scars are joined to the base of the rim and neck. Very fine, inclusionless fabric, possibly calcareous clay. Dull, pale orange with slightly tan surfaces.
73	Imported	Lykabettus Village	Rounded, bead rim, slightly undercut. Fine, slightly vesicular clay with occasional buff clay pellets to c. 1.0 mm, and occasional grey inclusions. Light green with slightly darker surfaces.

Table 2. Amphorae from Mons Porphyrites – Excavations 1996-1998. Organized by the amphora's site of origination. (Modified from Tomber, 2007)

Number	Site of Origination	Excavation Context	Description
74	Egyptian	Fort Complex	Fine, slightly granular silt with rare limestone inclusions to c. 1.0 mm. Brown throughout.

		(East Sebahk)	
75	Egyptian	Fort Complex (Trench I West Room)	Very faint handle scar beneath the rim. Pitched inside, on the rim top and in part outside. Silt with rare, fine limestone impurities. Brown throughout.
76	Egyptian	Fort Complex (South Sebahk)	Pitched inside and on the rim top. Fine silt. Brown throughout.
77	Egyptian	Fort Complex (South Sebahk)	Pitched inside, on the rim top and trailed down the handle. Fine silt. Brown throughout.
78	Egyptian	Fort Complex (East Sebahk)	Possibly pitched inside, but uncertain due to discoloration. Two rims, non joining. Fine, slightly vesicular silt. Brown with intermittent red core; surfaces mostly discolored, but brown where intact. MC Amphora 12.
79	Egyptian	Fort Complex (South Sebahk)	MC Amphora 15 with level orientation. Pitched inside and on the rim, outside and on the top. Brittle, fine silt. Brown throughout.
80	Egyptian	Fort Complex (Trench I)	MC Amphora 15 unevenly finished on the rim top. Fine silt. Brown with pink core and red-brown surfaces.
81	Egyptian	Fort Complex (South Sebahk)	MC Amphora 15 with rim dropped inside. Pitched inside and on the rim top. Fine, slightly sandy silt. Brown throughout.
82	Egyptian	Fort Complex (East Sebahk)	MC Amphora 15 with rim dropped inside. Pitched inside and on the rim top with some drips on the wall and part of the handle. Vesicular silt with limestone impurities to c. 0.5 mm. Brown with slightly duller surfaces outside.
83	Egyptian	Fort Complex (South Sebahk)	Lightly ribbed. Pitched inside and on the rim top. Fine silt with rare small limestone impurities and coarse sand-sized quartz. Red-brown, discolored slightly outside.
84	Egyptian	Fort Complex	Uneven wall, but not ribbed; clay accretions on the rim top. Pitched inside and on the rim top. Slightly sandy silt

		(South Sebahk)	with some limestone impurities. Brown throughout.
85	Egyptian	Fort Complex (Trench I East Room)	Two rims, joining. Silt with occasional sand-sized quartz and rare silt-sized quartz. Rare limestone eruptions to c. 1.0 mm are visible as voids, on both inside and outside surfaces. Brown with cream-green surface outside and in part on the rim inside.
86	Egyptian	Badia	Heavily pitched inside. Fine silt. Brown with slightly grey-brown core and surfaces concreted, mostly to pale brown.
87	Egyptian	Badia	Rounded bead rim. Sandy fabric with sparse, fine limestone impurities. Brown throughout.
88	Egyptian	Badia	Bead rim with flat outer face. Fine silt with occasional limestone to c. 1.0 mm. Burnt grey to brown throughout.
89	Egyptian	Fort Complex (East Sebahk)	Triangular-shaped rim. Fine silt with occasional quartz and limestone purities to c. 2.0 mm. Brown throughout.
90	Egyptian	Fort Complex (East Sebahk)	Bead rim with in-turned lip. Three rims, joining. Pitched inside and on the rim outside. Sandy silt with rare coarse sand-sized quartz and sparse flat, organic inclusions. Dull brown-red with surface discolored outside.
91	Egyptian	Badia	Double-lip rim. Pierced hole on vessel wall. Fine silt with coarse ill-sorted impurities, including limestone to c. 1.0 mm. Pale brown, slighter redder towards the margins, with brown to red-brown surfaces.
92	Egyptian	Badia	Double-lip rim. Fine silt with sparse limestone and silt-sized quartz. Brown with slightly duller and paler surfaces.
93	Egyptian	Badia	Out-turned rim and short neck. Crudely made. Burnt. Hard, dense silt with sparse quartz to c. 0.5-1.0 mm and occasional limestone impurities. Mottled pale orange to brown, but much of the vessel is discolored through burning.
94	Egyptian	Fort Complex	Base with depressed foot. Pitched inside. Very fine silt with rare limestone

		(East Sebakh)	impurities to c. < 0.5 mm. Brown throughout with heavily pitted surface.
95	Egyptian	Badia	Short base with concave lower profile and small slightly depressed foot. Heavily pitched inside with glassy deposit. Fine silt. Brown throughout; surface abraded on one side.
96	Egyptian	Fort Complex (North Sebakh)	Tall base. Deposit of pitch inside the foot, but none visible on the vessel walls. Fine silt. Brown with red-brown external margin in part; outside surface mottled brown to brown-red and heavily pitted.
97	Egyptian	Fort Complex (East Sebakh)	Burnt tall base. Fine silt with some elongate organic voids. Brown where not discolored from burning.
98	Egyptian	Badia	Slender, ridged foot. Burnt in part outside, heavily burnt inside. Fine silt. Brown where not discolored from burning.
99	Egyptian	Badia	Squat, broad, ridged foot. Pitched inside. Burnt all over. Fine silt. Color obscured by burning.
100	Northern Italy	Fort Complex (North and West Sebakh)	Schörendorfer 558. Finely granular, micaceous fabric with inclusions to c. 0.5 mm. Buff-tan with a cream surface. Dated to first and second centuries. Used possibly for olives.
101	Eastern Mediterranean (Aegean)	Fort Complex (East Sebakh)	Hollow-foot amphora. Two rims, joining. Red-brown fabric. Typically associated with third and fourth centuries. Used as wine container.
102	Cilicia (or similar locale in Eastern Mediterranean)	Fort Complex (West Sebakh)	Two footing amphora bases, non joining. Sparse, well-sorted, white, grey, and red fragments to c. 0.5 mm set in a dense, calcareous matrix of similar fine inclusions. Pink with lighter margins and darkened or discolored grey-brown surface outside, abraded in part.
103	Tripolitania	Badia	Tripolitania I. Handle scar below the rim. Dense fabric with common well-sorted quartz inclusions to c. 1.0 mm. Orange-red; white slip outside and on the rim, discolored surface inside. Dated to first

			to mid-second century. Used for oil containment.
104	LR1 (Cilicia or Cyprus)	Fort Complex (East Sebakh)	Two handles, joining. Heavily pitched inside. Densely packed well-sorted white, grey, red and dark inclusion c. 0.5 mm. Dull pink with grey-brown surfaces.
105	LR3 (Asia Minor)	Fort Complex (West Sebakh)	Burnt.
106	LR4 (Gaza)	Fort Complex (East Sebakh)	Square lid-seat rim, grooved between the handles. Crudely finished on the neck and around the handles. Two rims, joining. Pitched inside and on the rim. Slightly sandy. Orange with grey-brown inner margin and dull orange brown external surface.
107	LR4 (Gaza)	Fort Complex (East Sebakh)	Broad-style base. Four sherds, joining. Pitched inside. Fine fabric variant with rare silt-sized quartz, rare burnt organic voids; some large grey inclusions up to 5.0 mm are visible on the surface where abraded. Dull grey-brown, tending to medium-brown with orange margins; slightly cream-colored surface.

Table 3. Amphorae from Bir Umm Fawakhir – Survey 1993. Organized by the amphora’s site of origination. (Modified from Heidorn, 2000)

Number	Site of Origination	Excavation Context	Description
108	Egyptian	Vicinity of Building 75	Silt. Slip on exterior and over rim on interior. Some grog and sand noticed in break.
109	Egyptian	Dump on Slope Northeast of Building 93	Silt. Rim, handles, and shoulder. Drilled hole is at midpoint of neck. Some medium white particles visible in breaks.
110	LR1 (Cilicia or Cyprus)	Building 78	Rim and neck of Late Roman Amphora 1. Diameter is 9.9 cm.
111	LR1 (Cilicia or Cyprus)	Dump on Slope Northeast	Rim, neck, and handle of Late Roman Amphora 1. Handle is slightly twisted and shoulder has pronounced ridges. Part of

		of Building 93	inscription in red ink preserved on shoulder.
112	LR1 (Cilicia or Cyprus)	Building 104	Late Roman Amphora 1 fragment. Three grooves atop handle. Rim diameter is 10 cm. Fabric has some small- and medium-size white particles. Traces of red-painted symbol are on shoulder.
113	LR1 (Cilicia or Cyprus)	Quarry 2 (Middle)	Late Roman Amphora 1 rim. Diameter is 12 cm. Fabric is light brown.
114	LR1 (Cilicia or Cyprus)	Quarry 2 (North)	Three Late Roman Amphora 1 rim, neck, and handle sherds. Rim diameters are from 10 to 12.2 cm. Two sherds had smooth surfaces and some small white particles visible in the breaks. Third sherd was more porous and had grittier texture. Some small dark inclusions and sand visible in the break.
115	LR1 (Cilicia or Cyprus)	Path Between Outlier 4 and Main Settlement	Late Roman Amphora 1 jar sherds. Fabric is pinkish tan with sand temper. Red painted inscription preserved on shoulder region
116	North African (Tunisia)	Outlier 3	Rim and neck. Well-levigated clay with a few small white bits and some shiny particles visible in break and on surfaces.

Table 4. Amphorae from Bir Umm Fawakhir – Surveys 1996 and 1997. Organized by the amphora’s site of origination. (Modified from Meyer and Heidorn, 2011)

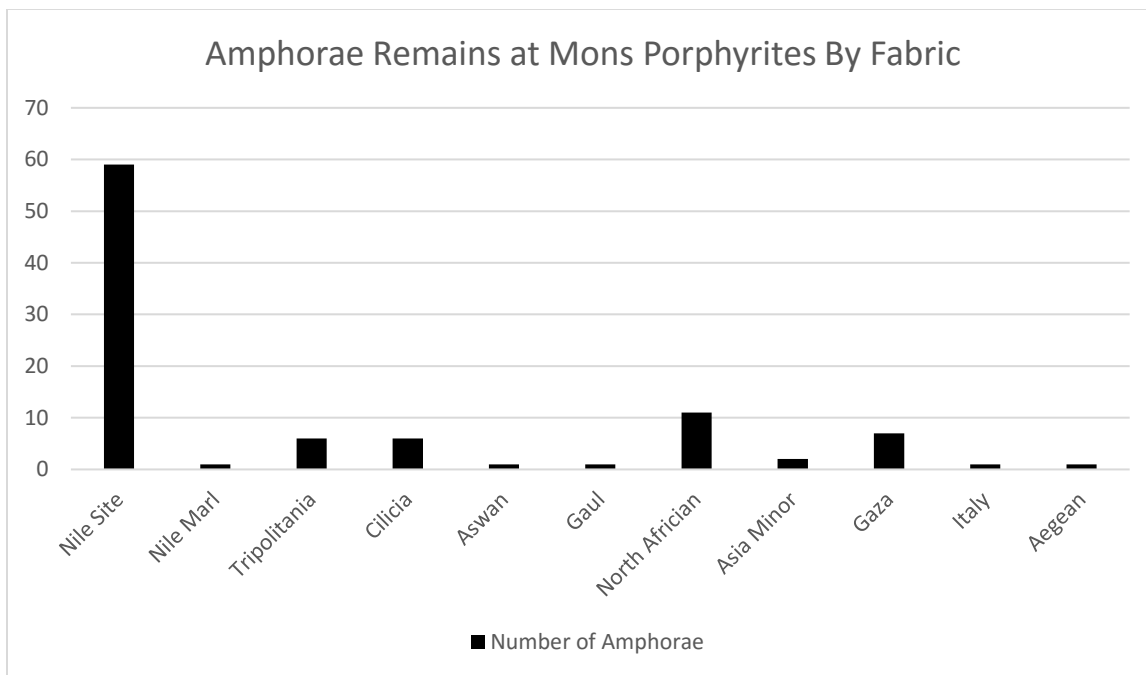
Number	Site of Origination	Excavation Context	Description
117	Egyptian	Main Settlement, Building 109	Silt. Shoulder. Dark red-brown fabric with gray-black core in most of section. Abundant limestone bits and mica.
118	Egyptian	Main Settlement, Building 106	Silt. Toe. Surface in poor condition, shape crooked. Many limestone chunks and slivers; perhaps mica.
119	Egyptian	Main Settlement, Building 106	Silt, very coarse. Toe. Brown.
120	Egyptian	Main Settlement,	Rim and neck. Red-yellow surfaces; tan section layers; thick gray cores. Marl;

		Building 106	abundant mica, medium to small-size gray-black bits; some limestone chunks, red bits.
121	Egyptian	Main Settlement, Building 176	Silt; abundant very angular limestone bits; sand, maybe mica. Rim, neck, and handles. Dates from 400-mid-7 th c. CE.
122	Egyptian (Aswan)	Main Settlement, Building 229	Aswan pink fabric; abundant black bits, medium amount mica; some sand; a few red bits. Pink with red-brown exterior.
123	Egyptian	Main Settlement, Building 124	Handmade. Beige. Toe.
124	Egyptian	Outlier 7, Building 99, Room 2	Rim, neck, and handles. Fingerprints pressed on inside, opposite handle. Light red-brown section; red slip exterior and into interior. Silt; medium amount sand, mica, limestone chunks and bits; a few red chunks; medium to abundant amount large chaffs.
125	Egyptian	Outlier 8	Slightly warped in manufacture. Red-brown with dark brown exterior; black core in handle. Silt; abundant small white bits; black bits, sand, mica.
126	Egyptian	Path from Quarry 2 to Outlier 7	Red-brown section; medium amount sand and mica; some limestone bits.
127	LR3? (Asia Minor?)	Main Settlement, Building 177	Silt, fairly soft; very micaceous; some small voids. Neck and rim. May be a very small Late Roman Amphora 3 type, but no handles or handle scars are left. Dark red-brown.
128	LR3? (Asia Minor?)	Outlier 6, Ravine north of Building 64	Rim and neck. May be Late Roman Amphora 3. Grayish, but perhaps burnt to this color. Marl; very abundant limestone bits and chunks; some mica; a few sand particles.

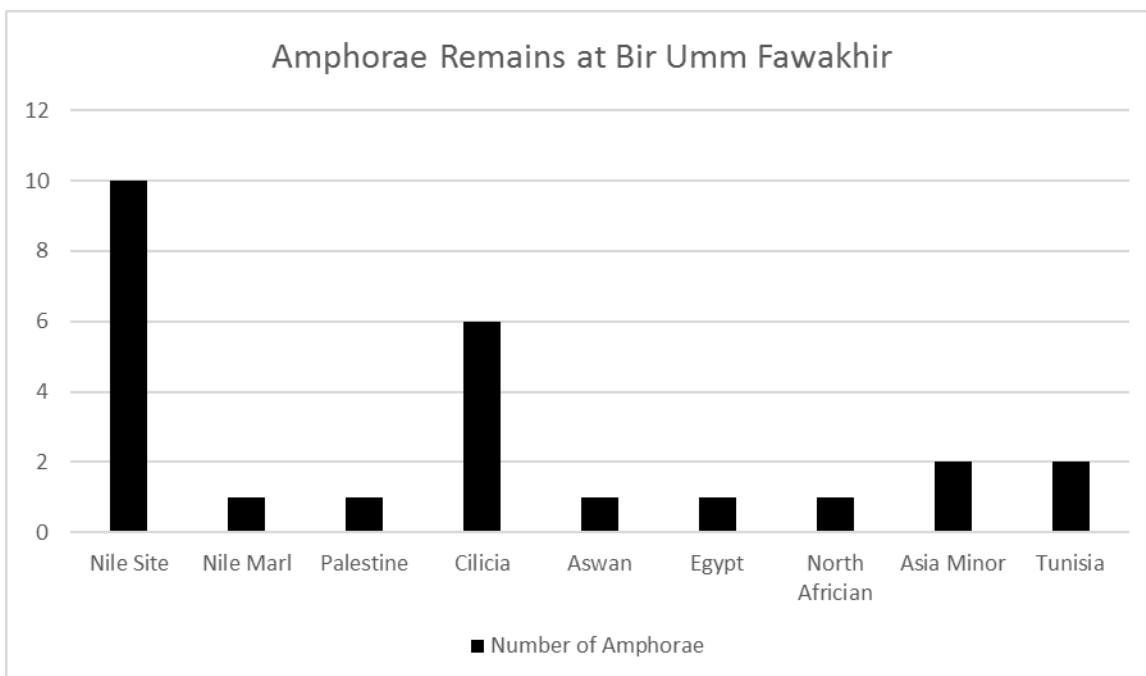
Table 5. Amphorae from Bir Umm Fawakhir – Excavations 1999-2001. Organized by the amphora’s site of origination. (Modified from Meyer and Heidorn, 2014)

Number	Site of Origination	Excavation Context	Description
129	LR5 (Palestine or Northern Egypt)	Building 93, Room C northwest	Late Roman Amphora 5, neck, shoulder, handles, ridged exterior. Gray core. Tempered with sand, white chunks, a little black. 6 th -7 th c.
130	LR7 (Egypt)	Surface Find	Late Roman Amphora 7, body segment. Silt. Dated to sixth and seventh centuries.
131	Tunisia	Building 93, Room C northwest	Fine ribs on neck, sloppy finish on interior and rim. Marl type import. Grayish core. Tempered with abundant black bits, some white bits. Dates to end of fifth to first half of sixth century.
132	Tunisia	Building 93, Room C northwest	Well smoothed, tough fabric. Very fine, sandy temper. Dates to end of fifth to first half of sixth century.

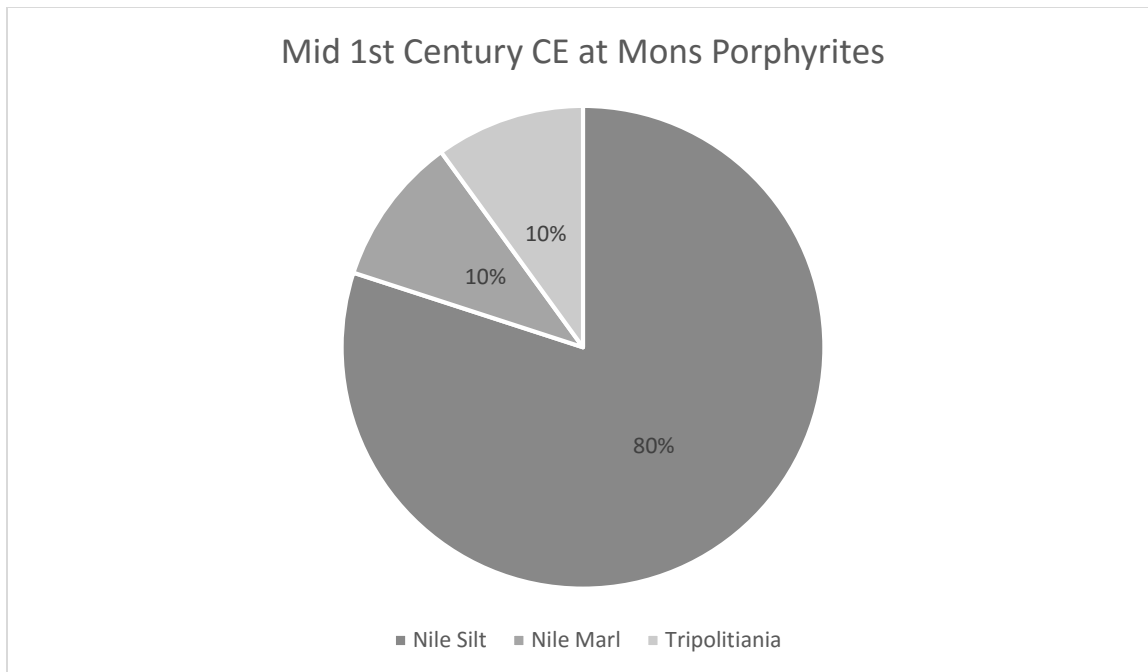
GRAPHS



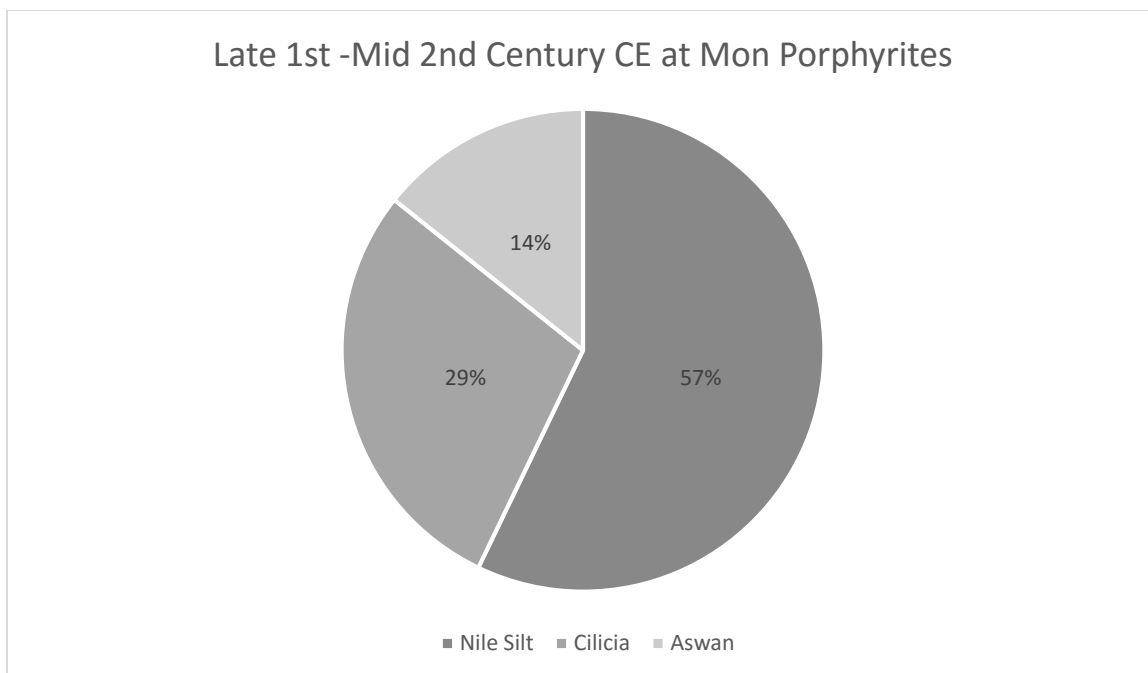
Graph 1. Distribution of Amphorae fabrics at Mons Porphyrites.



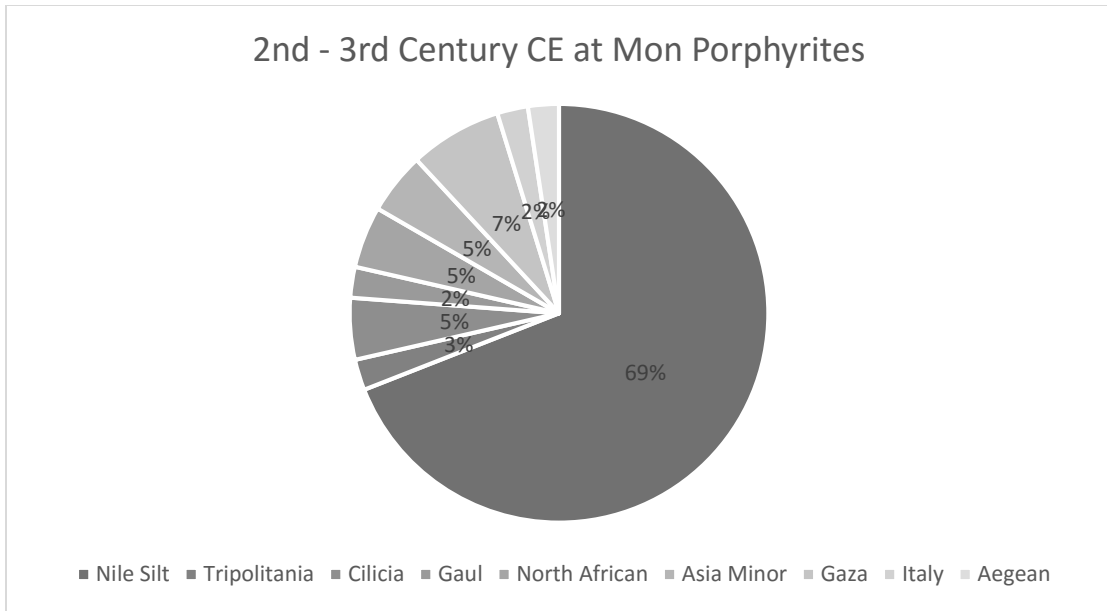
Graph 2. Distribution of amphorae fabrics at Bir Umm Fawakhir.



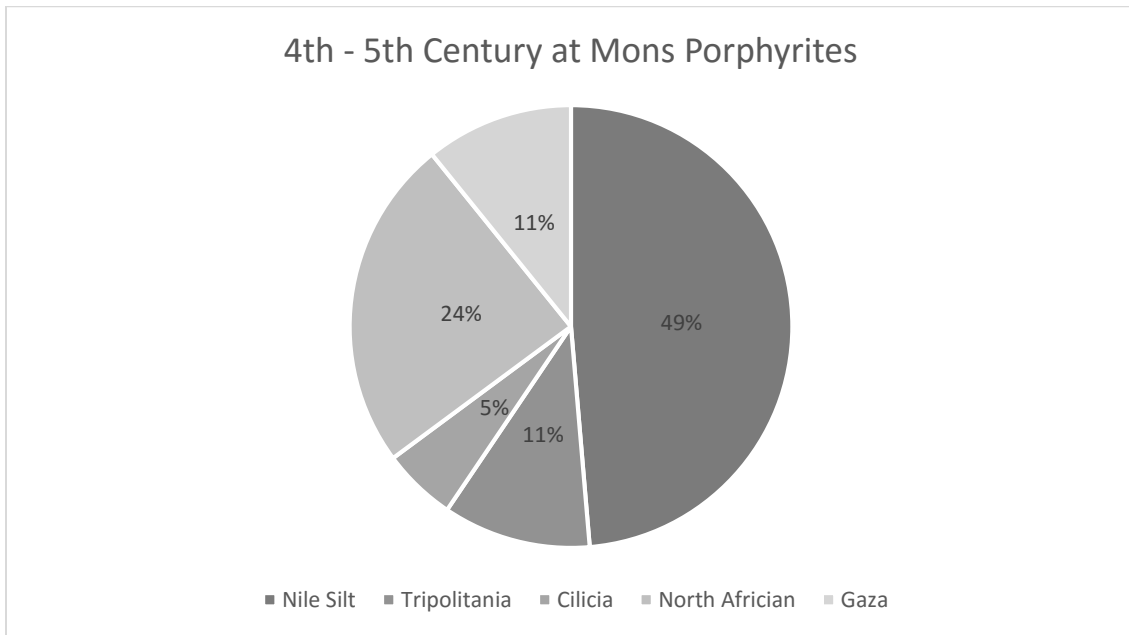
Graph 3. Distribution of amphorae fabrics in the Bradford and Foot Villages at Mons Porphyrites, which appear to have been occupied in the mid 1st century CE. From the remains it can be ascertained that in the origins of the site amphorae came from local production centers with one example of Tripolitanian.



Graph 4. Distribution of amphorae fabrics in the Northwest and Southwest Villages at Mons Porphyrites, which appear to have been occupied from the late 1st – mid 2nd century CE. While the amphorae again are mostly from production sites in relatively close proximity to the quarries, there is an increase in Cilician amphorae.



Graph 5. Distribution of amphorae fabrics in the central fort complex at Mons Porphyrites, which was occupied from the 2nd – 3rd century CE. By the 2nd-3rd centuries, the importation of amphorae throughout the Mediterranean is in full swing with remains from multiple production centers throughout the Mediterranean.



Graph 6. Distribution of amphorae fabrics in the Ramp and Lykabettus Villages and the Badia, which were occupied in the 4th-5th century CE. When activities are resumed in the 4th-5th centuries, we see a return to mostly local fabric from nearby production centers with examples of Tripolitania and Cilicia establishing a smaller scale, but still functional system of importation of goods from the eastern Mediterranean.

FIGURES

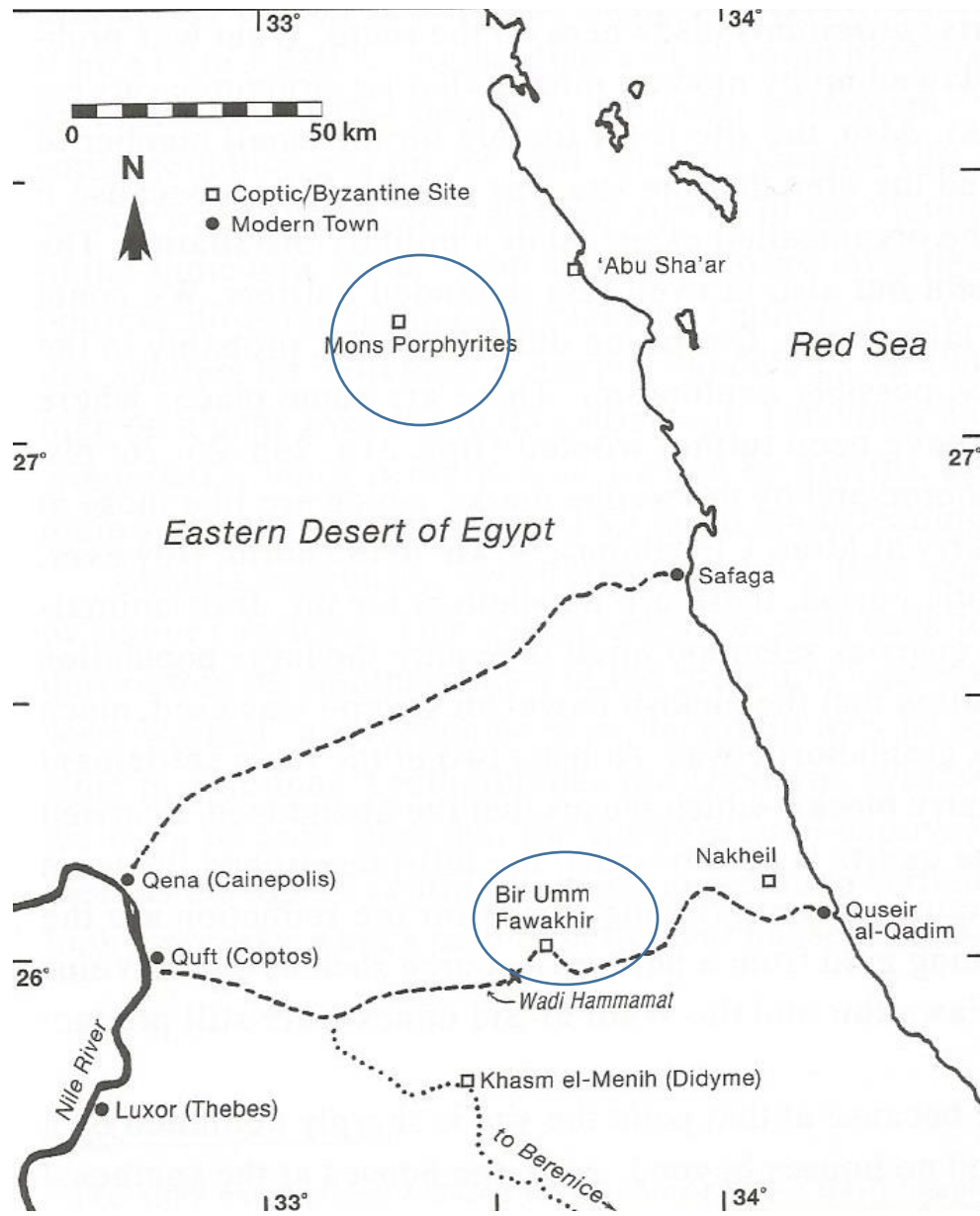


Fig. 1. Map of Eastern Desert of Egypt (Meyer, 2000).

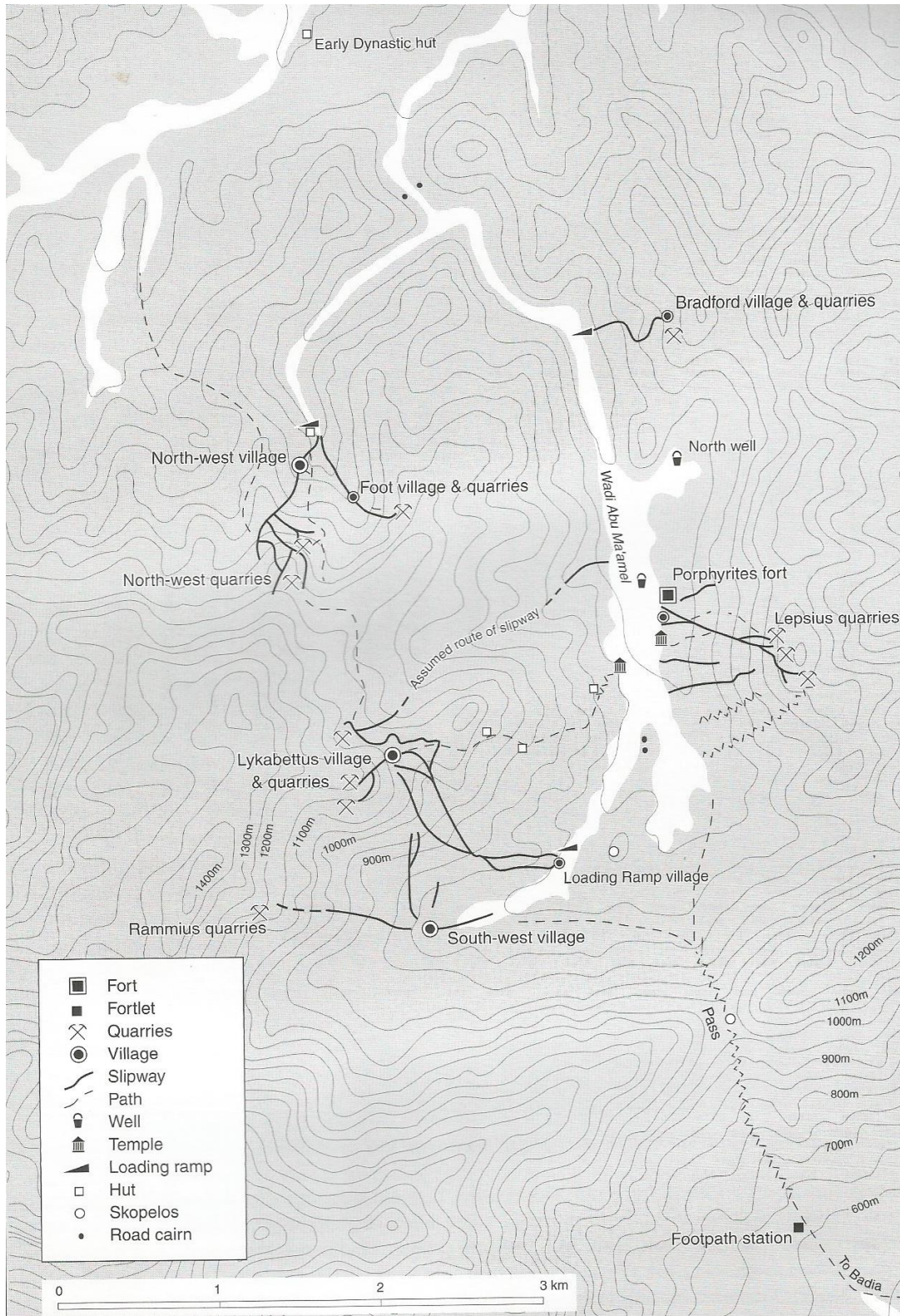


Fig. 2. Mons Porphyrites. Location map showing the central complex, the quarries, and quarry villages (Maxfield and Peacock, 2001).

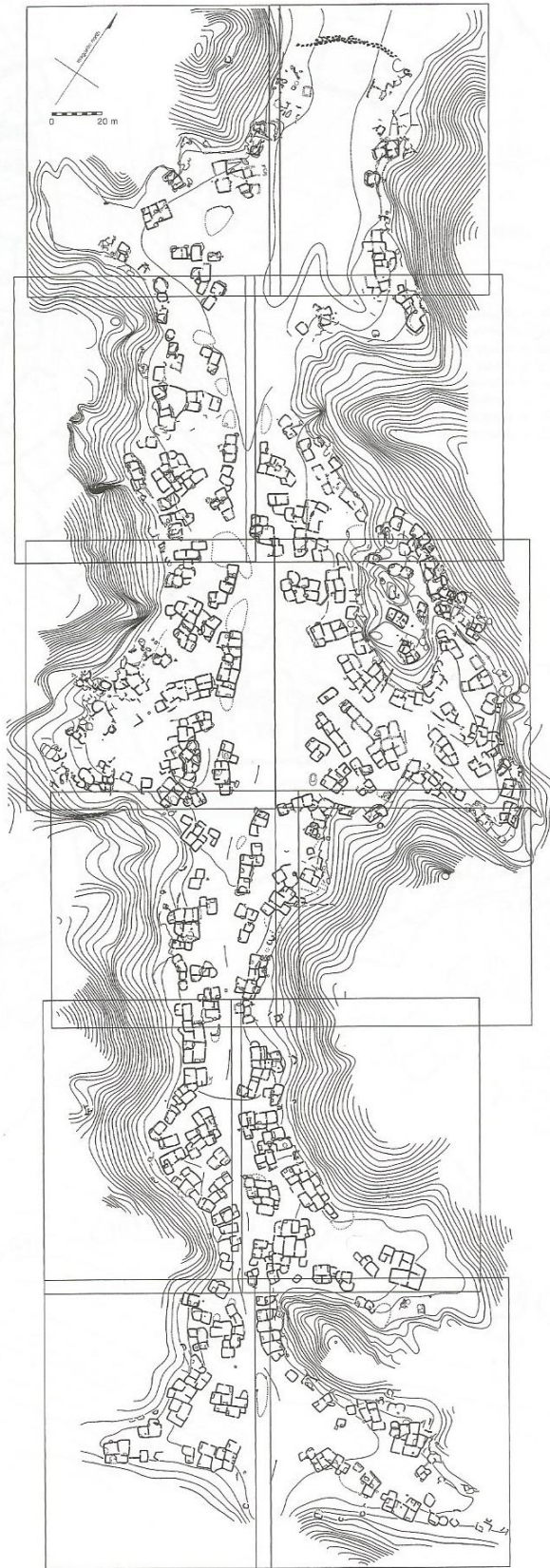


Fig. 3. Layout of Bir Umm Fawakhir (Meyer, 2011).

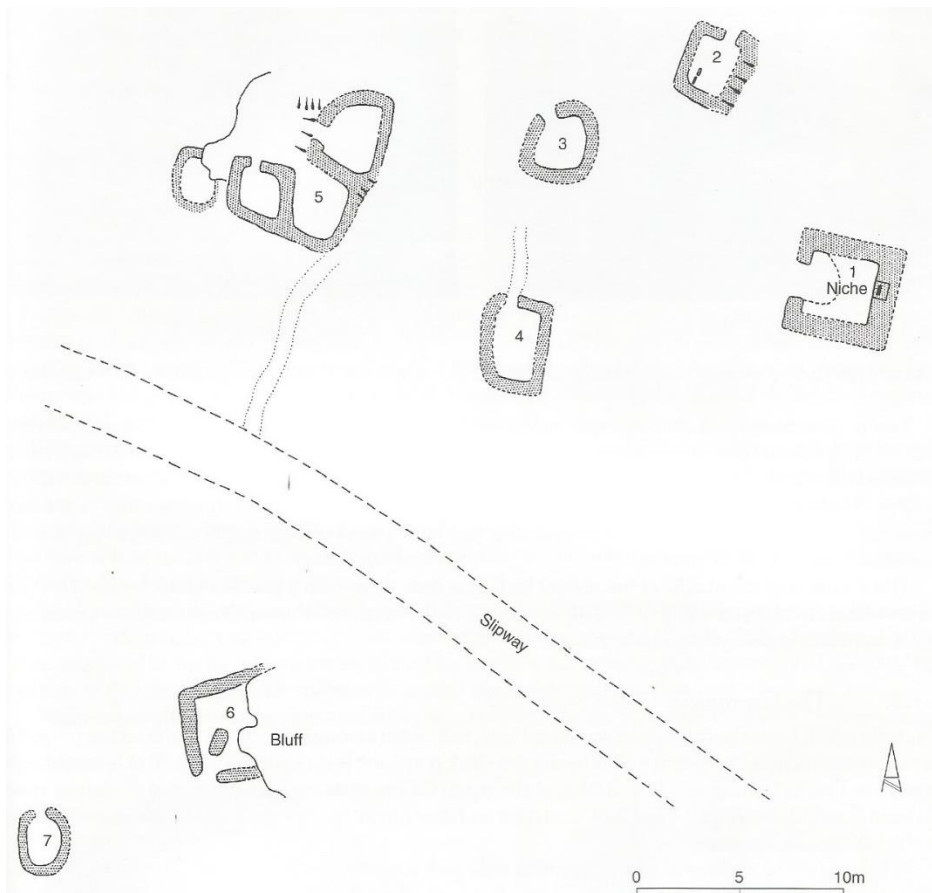


Fig. 4. Plan of Bradford Village, Mons Porphyrites (Maxfield and Peacock, 2001).

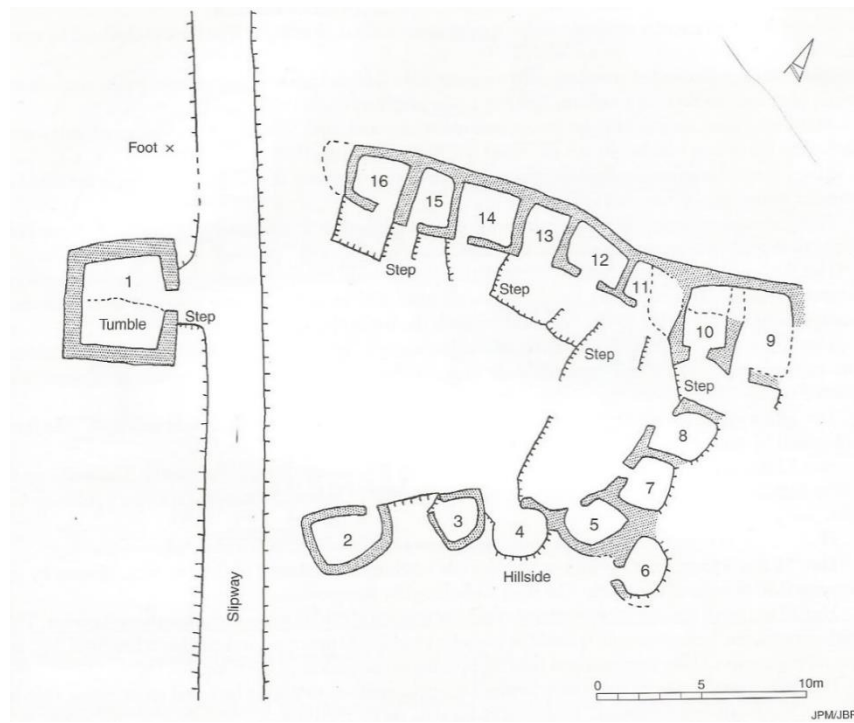


Fig. 5. Plan of the Foot Village, Mons Porphyrites (Maxfield and Peacock, 2001).

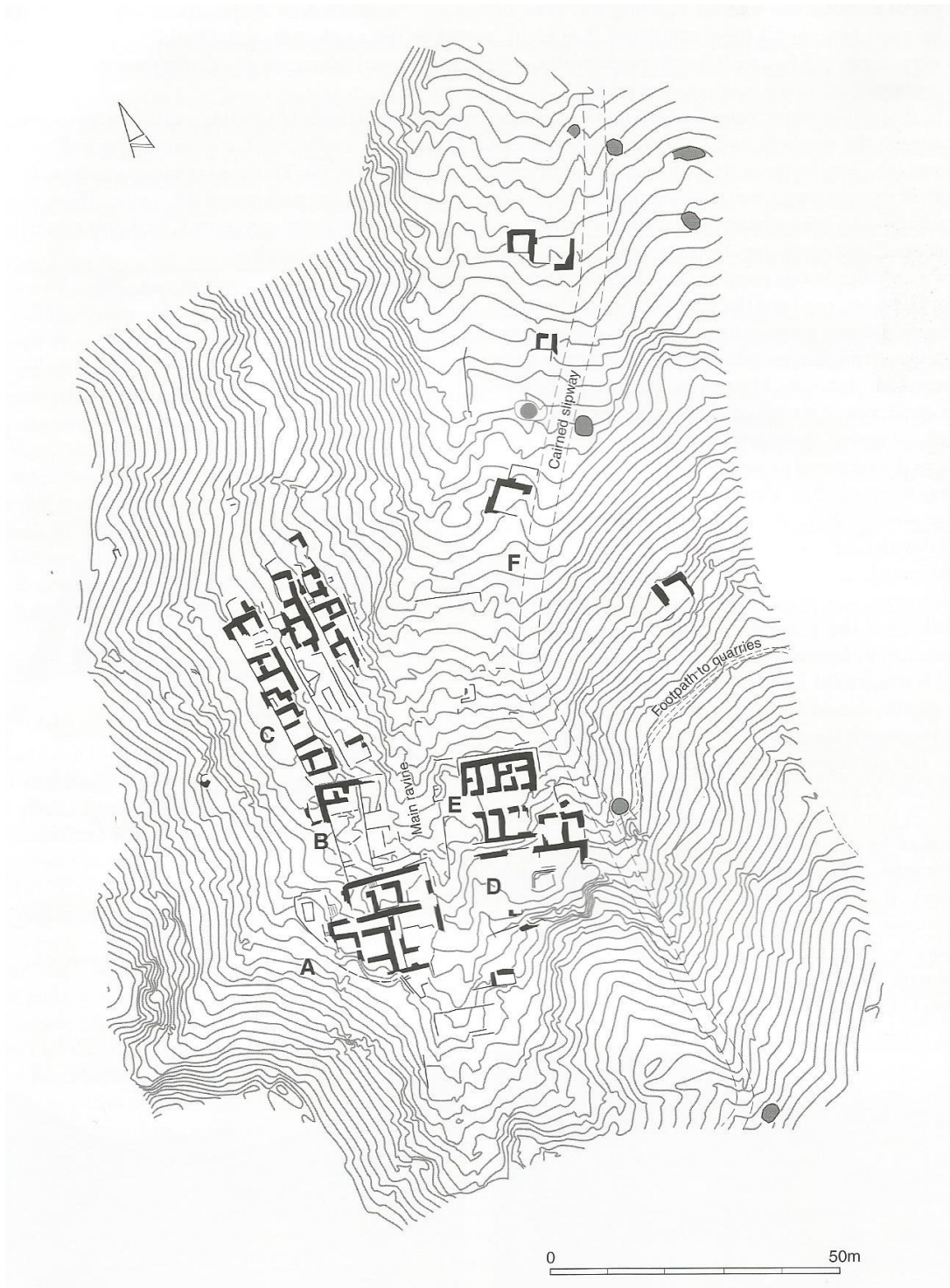


Fig. 6. North-West Village: overall plan, Mons Porphyrites (Maxfield and Peacock, 2001).



Fig. 7. South-West Village: overall plan, Mons Porphyrites (Maxfield and Peacock, 2001).

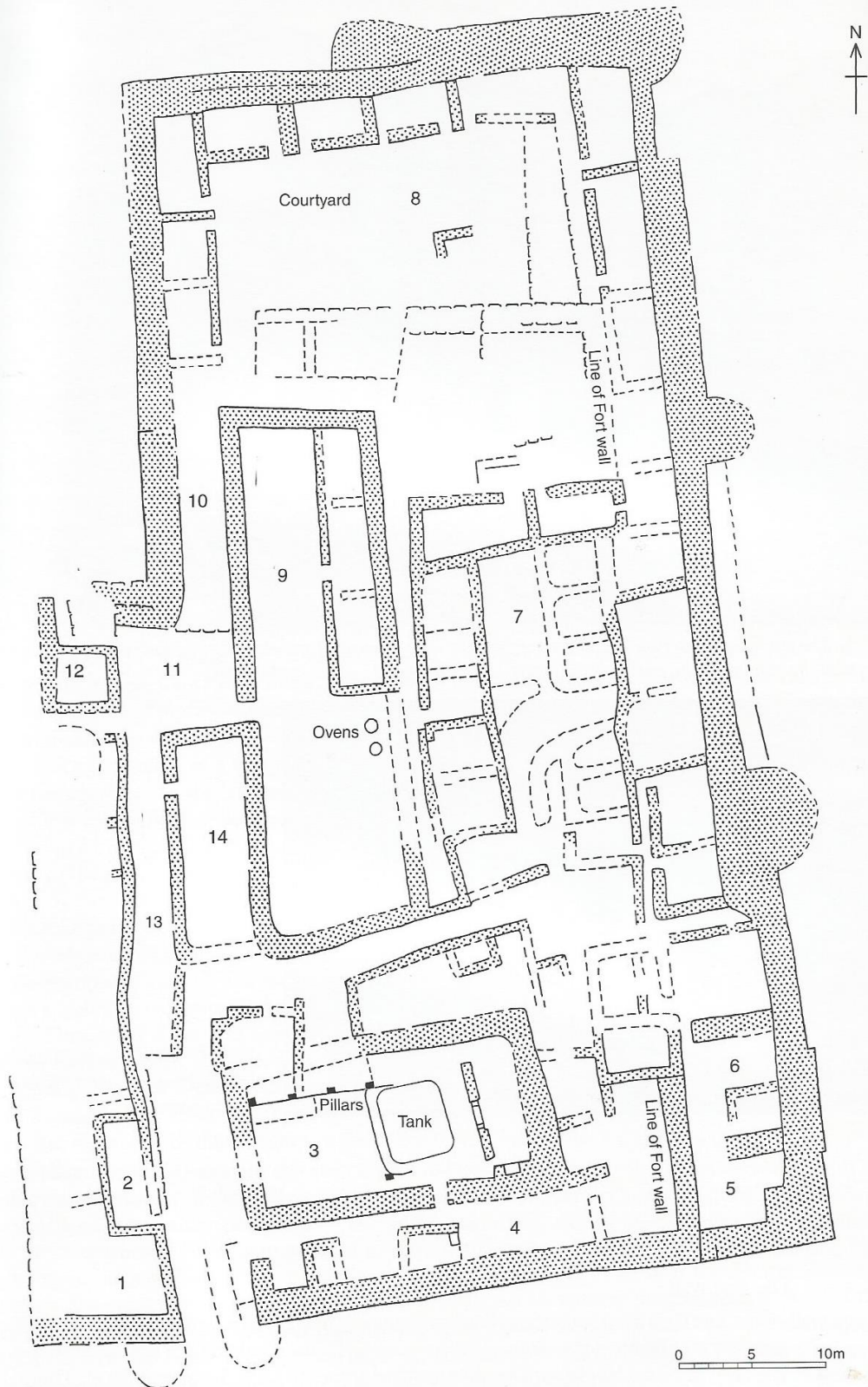


Fig. 8. The fort in the Wadi Abu Ma'amel, Mons Porphyrites (Maxfield and Peacock, 2001).

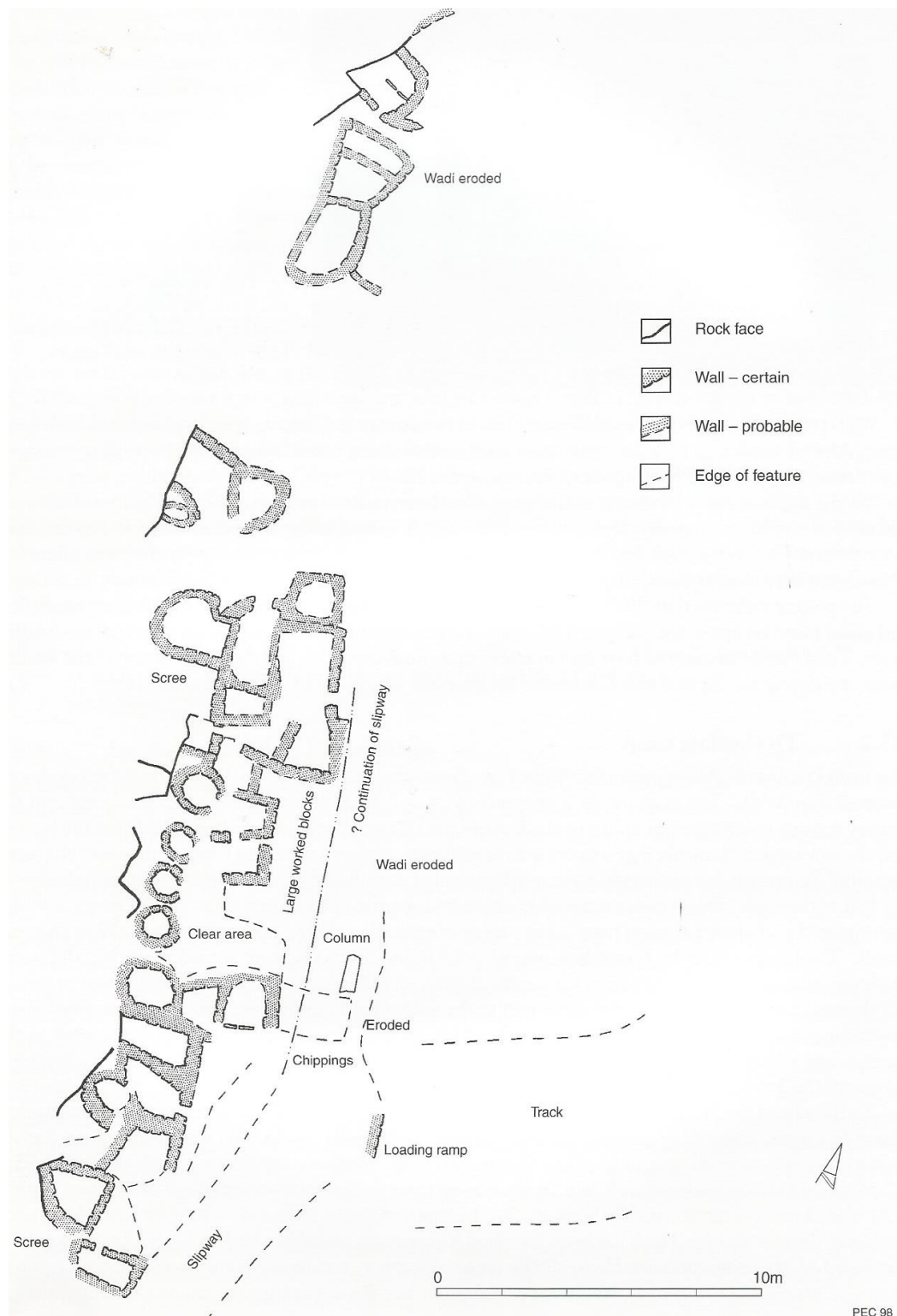


Fig. 9. Plan of Ramp Village, Mons Porphyrites (Maxfield and Peacock, 2001).



Fig. 10. Lykabettus Village, Mons Porphyrites (Maxfield and Peacock, 2001).

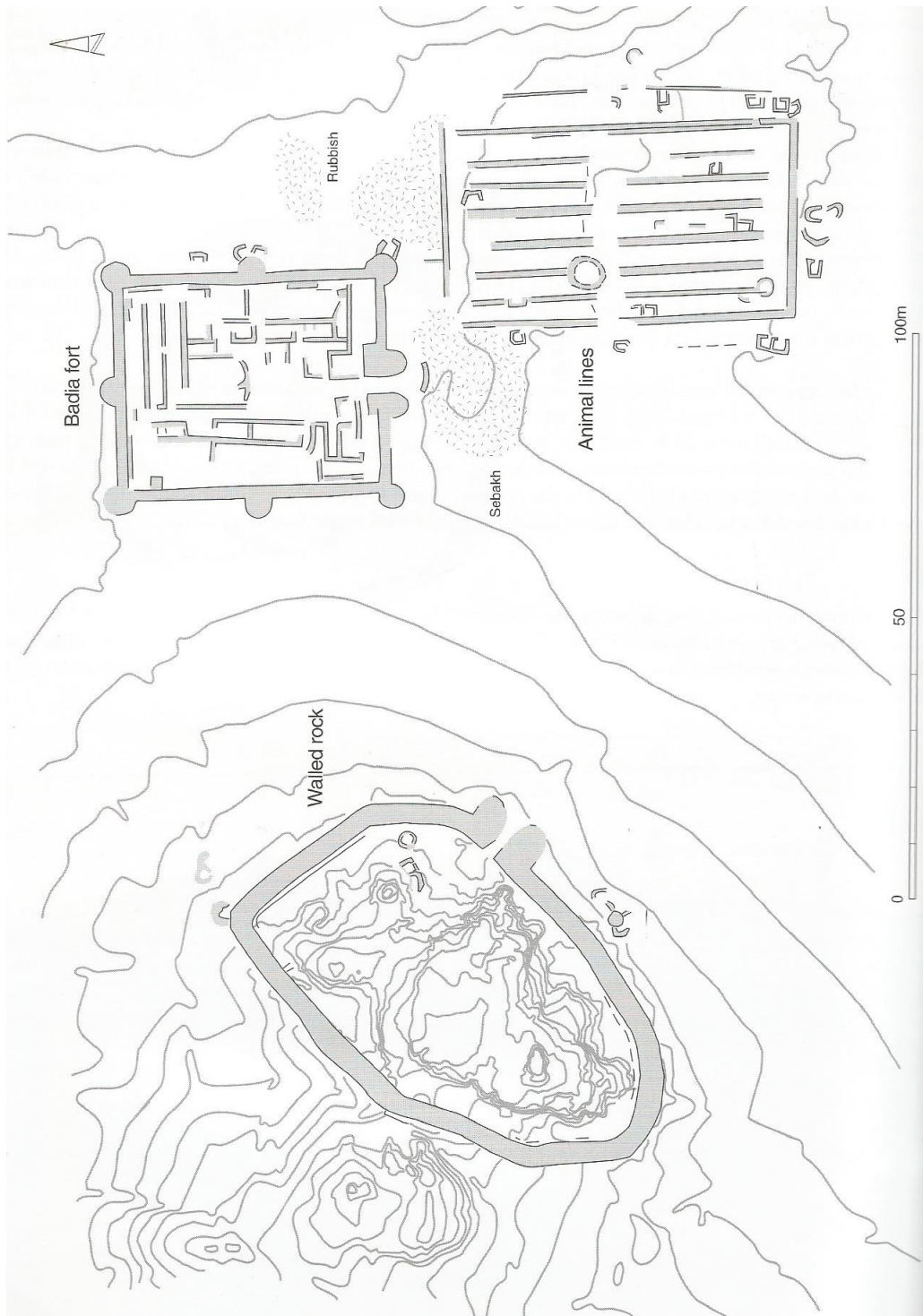


Fig. 11. Badia: plan of the fort, animal lines and fortified rock, Mons Porphyrites (Maxfield and Peacock, 2001).

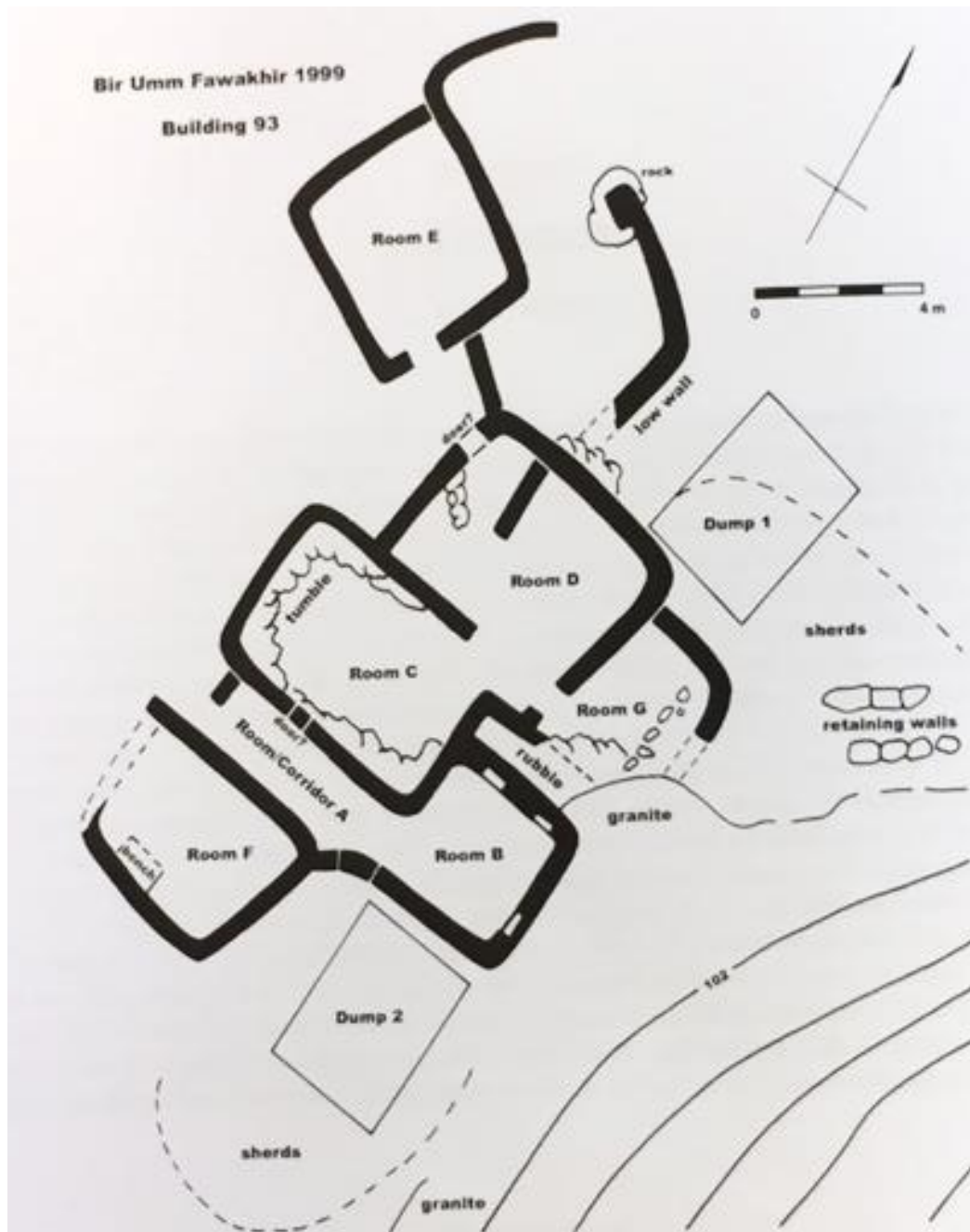


Fig. 12. Plan of Building 93, Bir Umm Fawakhir (Meyer, 2014).

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