



A LONG WALK IN THE DESERT: A STUDY OF THE ROMAN *HYDREUMATA* ALONG THE TRADE ROUTES BETWEEN THE RED SEA AND THE NILE

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ABSTRACT

*The routes through the Eastern Desert of Egypt were critical during the Roman Empire for the distribution of trade goods from the east; the roads that led from the ports of Myos Hormos and Berenike to the Nile emporium of Koptos were especially well travelled by caravans carrying valuable imports and exports. Along both of these roads watering stations, *hydreumata*, provided protection and respite for travelers. An examination of these stations, taken from archaeological evidence and written sources, provides insight into an additional function of the route from Myos Hormos to Koptos that the Berenike route did not fulfill—namely, that it acted as an internal *limes* within the desert that was meant to deter bandits and marauders from causing civil unrest. A successful show of force such as this was an effective way for the Empire to protect its revenue stream in a potentially unstable province.*

The greatness of the Roman Empire was due in part to its ability to acquire goods from around the known world, and even from places beyond the Empire's direct influence. Many of its trade routes reached the Mediterranean Sea by way of Egypt. Shipments of commodities traveled up the Red Sea from the south and east to the ports on the coast of Egypt, crossed the Eastern Desert, and followed the northern flow of the Nile to Alexandria. Four main trade routes connected the Red Sea ports with the Nile: the Via Hadriana, the route from Marsa Nakkia to Apollinopolis Magna, that from Myos Hormos to Koptos, and that from Berenike to Apollinopolis Magna and Koptos.¹ Further north were additional roads that connected the fort at Abu Sha'ar and the desert quarries with the Nile. The roads to Koptos from Myos Hormos and Berenike, the two busiest ports during the early Roman period, each had a system of towers and watering stations that demonstrated how important they were to the empire (see Figure 1).² The courses these roads followed were in existence long before the Roman, or even the Ptolemaic occupations, of Egypt. It was not until the Ptolemaic period, however, that the routes were primarily used for foreign trade. Later, sometime during the first and second centuries AD, the Romans were responsible for fortifying the routes with an organized network of

hydreumata, watering stations that were constructed as forts. Strabo writes about these stops:

Πρότερον μὲν οὖν ἐνυκτοπόρουσαν πρὸς τὰ ἄστρα βλέποντες οἱ καμηλέμποροι καὶ καθάπερ οἱ πλείοντες ὠδεύον κομίζοντες καὶ ὕδωρ, νυνὶ δὲ καὶ ὑδρεῖα κατεσκευάκασιν, ὀρύξαντες πολὺ βάθος, καὶ ἐκ τῶν οὐρανίων καίπερ ὄντων σπανίων ὅμως δεξαμενὰς πεποίηται.³

Formerly the camel-merchants travelled during the night, (directing their course by) looking at the stars, and, like mariners, carried water with them; but now, they have provided watering-places, digging to a great depth (to get the water); and they have created cisterns for the rain, although rare.

The way in which Strabo writes about the stations suggests that they were a relatively recent addition to the routes in the first century AD, although some unfortified stops existed even during the Ptolemaic era. Compared to the road from Berenike, the watering stations along the Myos Hormos route were placed closer together, and they were also more consistent in their

fortifications. The Berenike route was just as crucial for trade, since both ports saw equal amounts of importation, but its stations were not as regular and were farther apart. This suggests that the Myos Hormos route had a separate function from the other road.

Hélène Cuvigny states in *La route de Myos Hormos: L'armée romaine dans le désert Oriental d'Égypte* that the function of the stations was threefold: they policed the local desert by providing escorts for travelers, they were a way of passing along official information, and they supplied water.⁴ Other scholars have suggested that they also monitored the caravans for tax purposes.⁵ This article proposes that one additional function should be attributed to the Myos Hormos route: its individual stations were a network in the Eastern Desert that acted as a *limes* designed to show the dominance of the Roman military in that area. Steven Sidebotham asserts that all of the Eastern Desert routes could be defined as *limites* insofar as their policing function was a deterrent and warning to marauders.⁶ However, he does not distinguish between the trade routes and the quarry roads, and he suggests that the stations established by the Ptolemies functioned in the same way, even though the Romans were responsible for the majority of the fortifications, primarily along the Myos Hormos road. Although the stations leading from Myos Hormos formed an organized defensive line and the Berenike stations did not, the ports themselves both saw plenty of activity in the first through third centuries, when many of these stations were fortified.

Berenike was founded in 275 BC on the edge of the coastal plain between the branches of Wadi Mandit and Wadi Umm el-Mandit.⁷ Unfortunately, little evidence of activity during the Ptolemaic period exists today, since the remains were extensively looted. The surviving historical records are mainly from the first and second centuries AD, and the majority of the archaeological remains are from the fourth through the sixth centuries.⁸ After the Romans took over the eastern trade routes in the late first century BC, activity in Berenike thrived. Archaeological evidence shows that during the third century there was a decrease in occupation and activity, but in the early fourth century the town was expanded and the entire eastern part was rebuilt. The fourth and fifth centuries saw another high point in activity at the port, partly due to the fact that sometime around the mid to late fourth century Myos Hormos was abandoned, which made Berenike the primary Red Sea emporium.⁹ Evidence for the occupation of Berenike ends in the first half of the sixth century, and it was allowed to fall into ruin after the collapse of the Roman Empire and the arrival of the Arabs in Egypt in AD 640.¹⁰

The main imports into Berenike were luxury items, spices, and incense. Common exports included glass, cloth, grain, and wine, among other wares. During the early Roman period as many as a hundred ships set sail from Berenike each year.¹¹ In

addition to the imported commodities, there is also some evidence for the production of goods through local industry. The remains of metalworking shops and brick-firing facilities have been discovered. The residents of Berenike possibly also produced rope, glass and beads.¹² This activity meant that a good number of the people who inhabited Berenike lived in the city year round, instead of only during the trading seasons. One recent estimate, taken from the visible small buildings in the town center, places the size of the population at about 500 people.¹³

Myos Hormos was located at the site of Quseir el-Qadim, about eight kilometers north of the modern port town of Quseir.¹⁴ The port was founded probably around the same time as or just after Berenike, but the majority of the archaeological evidence does not show that it was firmly established until the late first century BC; it is possible that the Ptolemaic remains are located under the modern town and that ancient Quseir represents an entirely Roman foundation undertaken by Augustus.¹⁵ A timeline can be pieced together from the Roman remains, even though they are not great in quantity. From the late first century BC through the Flavian period Myos Hormos had a stable population. During the late first century on through the first half of the third century Myos Hormos eclipsed Berenike in activity, yet sometime in the mid to late fourth century it was abandoned.¹⁶ Goods found at Quseir el-Qadim show that trade in the area was centered more around basic products rather than luxury items. The main exports out of Myos Hormos were glass and cloth; the presence of glass slag and a convenient sand supply suggest that glass was manufactured in the area.¹⁷

Although the twelve-day journey from Berenike to Koptos took longer than from Myos Hormos to Koptos (which took only six or seven days), several factors favored Berenike as a starting point.¹⁸ The greatest advantage was that the city was situated at the southern edge of Egypt, closer to the opening of the Red Sea, which meant that sailors did not have to fight with the difficulties associated with sailing up the Red Sea. The sailing time between the ports could be as much as five and a half days and the conditions were poor. The prevailing winds blew strongly in the northern part of the Red Sea, and the skippered ships from India had difficulty sailing against these northern winds.¹⁹ The Ras Banas peninsula acted as a shelter for ships against the winds. Furthermore, currents around the peninsula were difficult to navigate, coral reefs obstructed the waterways along the coast, and piracy plagued the area throughout the Greek and Roman periods.²⁰ The traders had to decide whether they were willing to face a longer march through the desert by stopping at Berenike, or a longer sea voyage by going to Myos Hormos. Because of their different advantages, Berenike and Myos Hormos both functioned for several centuries as the most important Egyptian ports for international trade. They were not necessarily in competition with each other, but may have had a symbiotic

relationship. Indeed, in years in which the northern winds were stronger, fewer ships were capable of sailing all the way to Myos Hormos, so Berenike would shoulder the extra business. The towns were also able to prosper at the same time, as they did from the late first century BC until the late first century AD; the *Periplus Maris Erythraei* and the archive of Nicanor refer to both ports and reveal that they had equal amounts of activity.²¹ The route that led from Myos Hormos to Koptos, however, was more built-up than the Berenike route, indicating that it was the more important road.

The trade routes were laid out along the bottoms of the wadis, which were mostly flat and packed with sand and gravel. In between the fortified watering stations, they were lined by a series of small square watch towers, constructed of stacked stone without mortar, about 0.7 meters thick and about 2.5 meters high. The Myos Hormos towers were larger and better preserved than the towers along other routes; the majority have been ruined at their highest point, but some examples still have their platforms, where a person could sit, surrounded by a small parapet. These towers were situated so that they were intervisible, so they could be used for relaying messages from one side of the desert to the other, or for spotting bands of marauders that could pose a threat to the stations.²² However, since this was a hyperarid environment, and water was a major concern, it was the *hydreumata*, not the towers, that were essential to travelers, due to the fact that they provided water at various points along the road.

If a caravan traveled west from Myos Hormos (Quseir) to Koptos (Qift), the closest station was the fort at Bi'r Nakheil, which was eight kilometers north of the road to Koptos. The first fortified station on the direct road to Koptos was el-Duwi (formerly Simiou) followed by Seyala, el-Hamrah, and el-Zerkah (Roman Maximianon). The ensuing Roman period *hydreuma* at Bir Umm Fawakhir was not preserved due to the construction of a fifth to seventh century Byzantine/Coptic gold mining town, but the subsequent *hydreumata* were el-Hammamat (Porsou) and el-Muweih (Krokodilo). Qasr el-Banat was the last station on the Myos Hormos-Koptos road before it merged with the road from Berenike at el-Laqeita (Phoenicon), and the final station before Koptos was el-Matula.

Of the stations enumerated above, el-Duwi, el-Hamrah, el-Zerkah, el-Hammamat, and el-Muweih were the most similar in their layout. They were all roughly square with a single entrance centered along one wall, and rooms that faced onto a large, open courtyard within. The rooms functioned as barracks for the soldiers and travelers, while the animals from the caravans were presumably kept in the courtyards. The building materials were predominantly local stone. The water sources, either wells or cisterns, were located in the central courtyards. These five stations all had towers, accessible by stairs, at their four corners and flanking their entrances; however, el-Duwi had three

additional semi-circular towers halfway along its perimeter walls. The perimeter walls of el-Duwi measured 55 meters by 56.25 meters and were approximately two meters in height and between 1.5 and 1.6 meters thick when complete. Inside el-Duwi the rooms lined the northern and western walls. El-Hamrah was the largest of these stations, measuring about 59 by 57 meters. About twenty rooms lined the interior of the northeast and northwest walls. El-Zerkah had defensive walls that were 56.4 meters long and 55.9 meters wide, not including the projection of the corner towers. Inside the station, all four walls had rooms adjacent to them. The well depression was the largest of all the stations on the route, measuring ten meters deep and 30 meters in diameter. It was accessed by a stairway on the west side. A small complex of freestanding buildings lay north of the depression; these were likely associated with the well. El-Hammamat had a square outline that measured 53.5 meters on each side. Rooms were located along the north and west sides. El-Muweih was basically square, 53.3 meters by 52 meters. The interior rooms were adjacent to the south and west walls, as well as the southern half of the east wall, and an isolated battlement was found just inside the entrance. It is unclear whether any rooms were present in the northeastern part of the station.²³

Bir Nakheil, Seyala, Qasr el-Banat, and el-Matula were slightly different from the previously described stations in that they were smaller and more rectangular than square. The *hydreuma* at Bir Nakheil was quadrilateral with an entrance on the south side and possibly towers. Due to the fact that a modern wall has obscured the northern part of the defensive walls, the dimensions cannot be ascertained, although the southern wall was approximately 42 meters in length. Two modern wells were constructed within the fort, making the location of the ancient water source uncertain as well. Seyala was also badly deteriorated; about half of the foundations of the station were washed away and the inside of the fort was ruined. The length of the western wall and most of the northern substructure can still be seen; these walls measured 37.6 meters and 42 meters, respectively, and the corners of the ramparts were rounded. Three cisterns were dug next to each other in the central courtyard, and barracks would have lined the inside of the perimeter wall. Only one stairway was preserved; this provided access to the wall in the northwest corner, near a quadrilateral tower that was added at some point. After the tower was built the station had some reconstructions of the exterior of the defensive wall, possibly to repair damage due to flooding or deterioration.²⁴ Qasr el-Banat was a smaller station, measuring approximately 39 by 31 meters with rounded corners. It appears that there were no towers in the corners or along the walls, but the entrance, on the north side, had square towers on either side. The inner side of its defensive walls were all lined with rooms. There is no existing evidence of a well in the courtyard, but there may have been a cistern at the southern edge.²⁵ The last station before the Nile was el-Matula, another

site that yields limited information due to destruction and sand. There were towers on the southeast and southwest corners, and presumably the other corners had towers as well. There is no evidence of an interior well or cistern, but it is possible that it could be buried.²⁶

It is unfortunate that the *hydreumata* at el-Fawakhir and el-Laqeita have been completely destroyed, but enough evidence points to stations existing at both locations at the same time as the others. The remains of a settlement at Bir Umm Fawakhir are from a fifth to seventh century Byzantine/Coptic gold mining town, rather than from a Roman period *hydreuma*.²⁷ However, this must have been an important center before it was rebuilt as a Byzantine settlement; here there was a good source of water and numerous wells were built around the settlement, as well as granite quarries that were prone to be exploited by the Romans. The Romans likely positioned a caravan stop here since the site was located on the south side of the ancient trade road. A row of cut blocks located in the area of the heaviest wadi wash from floods was possibly from a wall from a Roman building.²⁸ The Byzantine town could have been built on top of the Roman *hydreuma* and the stones reused, or the remains of the *hydreuma* might have been washed away. The remains of Phoenicon, the Roman *hydreuma* located at el-Laqeita, were also unfortunately destroyed, although it must have existed since this was clearly an important site due to its water resources. The remains were likely reused by later occupants.²⁹ Two inscriptions at the site date to the first century: one is a dedication to Pan, and the other refers to a centurion named C. Papirius Aequus of III *Cyrenaica*.³⁰

The fortified stations between Myos Hormos and Koptos are unfortunately difficult to date. Generally, Roman forts from the early imperial period did not tend to have towers. Gradually they gained more towers and became smaller as time went on.³¹ Based on these guidelines, the earliest forts on the route were Bir Nakheil and Qasr el-Banat, followed by Seyala and el-Zerkah, then el-Muweih, el-Hammamat, and el-Hamrah, then finally el-Duwi. However, this dating cannot be accurate, since archaeological evidence from ostraka suggests that el-Zerkah and el-Hammamat were occupied during the first and second centuries, while Bir Nakheil, el-Duwi, Seyala, el-Hamrah, and el-Muweih had second century evidence, and Qasr el-Banat was occupied between the second and third centuries. Despite their lack of architectural remains, evidence was also found at el-Fawakhir and el-Laqeita proving occupation between the first and third centuries AD for the former site and between the first and fourth centuries for the latter.³² Some of the stations were erected before the others, but by the second century, when the quarries and the ports were in full use, all of the Myos Hormos stations were in use as well. Although some structural details differ, the stations built in the second century matched the fortifications of the earlier stations enough that they must have purposefully created structural similarities. The few variations in size and the number

of towers attached to the different stations could be explained by repairs and reconstructions carried out over time.

If a caravan traveled northwest from Berenike to Koptos the closest stop was a cluster of fortifications in Wadi Abu Greiya (Vetus Hydreuma, or Trogodyticum). Then the next stop on the road to Koptos was Novum Hydreuma, within Wadi el-Khashir. The next few sites, Abu Ghalqa, Abu Ghusun (Cabalsi), and two forts in Wadi Abu Hegilig, were all close in proximity to each other. Several buildings in Wadi Gemal were known as Apollonos. A few sites were located close to where the road from Berenike split into the Apollonopolis Magna (modern Edfu) and the Koptos routes, including a fort at Umm Gariya, ad-Dweig (Falacro), and a small stop at Sha'it. The next stops were Wadi Gerf (Aristonis), a small stop at Rod Legaya, and an additional settlement at Rod el-Buram. Further north were Bezah and Wadi Abu Greiya (either could be ancient Jovis). Two sites were situated in Wadi Daghbag; the first encountered was Daghbag South, then Compasi. The next *hydreuma* was Aphrodito, and a short distance north was a rock shelter where travelers could rest and take a break from the sun. Khasm el-Menih (Didyme) was the final stop on the route before the Berenike road met up with the Myos Hormos road.

The stations on the road from Berenike to Koptos exhibited more variation in their plans than the stations to the north; some of the *hydreumata* were circular or semicircular, a few were unfortified, while several were quadrilateral like the stations on the Myos Hormos road. Similar stations included Falacro, which was rectangular, had heavy walls made of rough blocks, round corner towers, and interior rooms set along the perimeter walls. It was, however, smaller than other stations, at 25 by 30 meters.³³ Another rectangular fort at Aristonis had relatively heavy walls, 44 meters by 33.5 meters, with round corner towers, and a rectangular cistern within the interior courtyard.³⁴ Bezah measured 43 by 34.4 meters and was made of rough blocks with towers. Interior rooms lined the walls, and the courtyard had both a circular well and a rectangular cistern made of baked brick. Wadi Abu Greiya had a fortified station 55 meters by 50 meters, and had towers along the parapet with interior rooms and a large brick cistern in the courtyard.³⁵ Aphrodito was a rectangular fort with towers and was assembled from irregularly shaped stone. It measured about 49 by 38 meters.³⁶ Didyme was well fortified, with round towers at the corners and flanking the entrance. Its dimensions were 54 meters by 43 meters. Within the *hydreuma* were many rooms lining the inside of the perimeter walls, and the courtyard had two central cisterns.³⁷

Some of the stations were vastly different. Novum Hydreuma had an elliptical shape and the perimeter was made up of gravel banks.³⁸ Apollonos has been badly deteriorated from floods, but two of its perimeter walls suggest that it had a triangular shape. This was the largest station on the route: the north wall was 118 meters in length, and the east wall was about 78 meters.³⁹ Umm

Gariya had a small fort that was semi-circular in shape and had no towers.⁴⁰ Vetus Hydreuma had a cluster of fortified buildings, rather than a single *hydreuma*. Five forts were on the west side of the wadi: two on the top of the hill, two large rectangular buildings on the bottom of the wadi, and one on the hillside between them.⁴¹ Likewise, Wadi Abu Hegilig had two quadrilateral forts.⁴² There were also a few unfortified stops, like the small unfortified stop at Sha'it, a small unfortified stop at Rod Legaya, and an unfortified settlement at Rod el-Buram. Due to deterioration, some of the archaeological sites do not have enough information to create a comparison. The remnants of Cabalsi consist of only one perimeter wall made of stacked stones, indicating that the site could have been quadrilateral.⁴³ Daghbag South is also in ruins; it consists of an area of prehistoric petroglyphs around a stone-lined well. About half a kilometer north of this are the remains of Compasi, which have only one section of the eastern wall and parts of a cistern remaining.⁴⁴

Not all of the stops on the Berenike to Koptos route were fortified *hydreumata*, and some were placed so close to each other that they were probably not used at the same time. Abu Ghalqa, Abu Ghusun (Cabalsi), Abu Hegilig South, and Abu Hegilig North were all in such close proximity that Cabalsi was likely the only major *hydreuma* out of the four sites, at least during the height of the Empire (and Abu Ghalqa, at any rate, was a late antique site). The sites clustered around the bifurcation of the roads were also not all *hydreumata*. Only Falacro was clearly a major station; Umm Gariya was small and early, and Sha'it was unfortified. Of the next few stations Aristonis was fortified, but Rod Legala and Rod el-Buram were not. The main stations along the road were therefore Vetus Hydreuma, Novum Hydreuma, Cabalsi, Apollonos, Falacro, Aristonis, Jovis, Compasi, Aphrodito, and Didyme.⁴⁵

When the architecture of each *hydreuma* described above is examined it becomes clear that the stations along the Myos Hormos road were designed in a more uniform manner than the Berenike stations. Likewise, it becomes apparent that the northern road formed a more solid defensive line when each route is examined as a system of fortifications. The distances between the Myos Hormos stations created a perceptibly stronger line of defense that can be defined as a *limes*, unlike the Berenike road, which lacked the same density of fortified points. Combined with the possibility that they were in use all year long, and the well documented presence of military personnel, the Myos Hormos road provided an intimidating defensive line that bandits would not want to disturb.

To prove that the distances between stations on each route were different in a significant way, the rate in which a caravan of merchants could travel must be examined. Travel could have been done on foot or by pack animals, such as donkeys or camels.⁴⁶ A camel laden with baggage can travel at about five kilometers per hour, which is about the same pace that a person is

able to walk. A laden donkey travels a bit slower. We can assume, therefore, that the caravans were able to travel about 4 to 4.5 kilometers per hour, and that in an 8 hour day they could travel up to about 36 kilometers.⁴⁷ A soldier weighed down by armor and supplies, however, would not be able to travel as quickly, and therefore could not cover as much ground in a day as a merchant's caravan.

The distances between the Myos Hormos-Koptos stations were as follows: 27 km to el-Duwi, with a possible digression north to Bi'r al-Nakhil about halfway along; 14 km to Seyala; 11 km to el-Hamrah; 12 km to el-Zerkah; 23 km to el-Fawakhir; 8 km to el-Hammamat; 16 km to el-Muweih; 14 km to Qasr el-Banat; 15 km to el-Laqeita; 17 km to el-Matula; and 17 km to Koptos. This gives an average of 15.8 kilometers between successive stations. Since the caravans could travel many more kilometers per day than this, they would not have spent the night at each stop, but at about every other stop. El-Duwi, el-Hamrah, el-Fawakhir, el-Muweih, and el-Laqeita were the most likely stops at which a caravan would rest. If a unit of soldiers needed to march from one station to another, they could accomplish this within a day, and could quickly deliver aid to a station if it was needed. From the arrangement and fortifications of the Berenike stations, one surmises that the main *hydreumata* were Vetus Hydreuma, Novum Hydreuma, Cabalsi, Apollonos, Falacro, Aristonis, Jovis, Compasi, Aphrodito, and Didyme. If one uses this list of stops and assumes that the rest of the installations were either not functioning at the same time or were too small to be relevant, then the average distance between the stations was approximately 36.5 kilometers, a distance which could be accomplished in a long day of travel.⁴⁸ Unlike on the Myos Hormos road, caravans could not easily skip over any of the major *hydreumata* during their journey.

The reason for the difference in the density of the stations along the two routes is at first ambiguous. The Myos Hormos route could have been built up simply because it had more traffic. However, although Myos Hormos saw more ships than Berenike in some years, the ports were comparable in importance and therefore both routes had equal reason to be heavily defended. Additionally, the goods that were imported into Berenike were mainly high-priced items that needed to be protected as well as possible, which means the stations were placed as close together as necessary. The southern route could have been safer than the Myos Hormos route, but this is unlikely since the Nubian border was an area of concern to the Romans. A more likely possibility for the discrepancy is that the Romans sought to build up the Myos Hormos road because it was located centrally—in between the northern quarries and the southern border—and was therefore well placed to demonstrate the authority of the Romans and act as a deterrent to possible uprisings. In modern military terms, this is referred to as a “show of force,” an operation that involves an increase in the visibility of a nation's forces in an

attempt to dissolve a situation that may be detrimental to that nation's interests.⁴⁹

One prominent historical example of a show of force is the Maginot Line from World War II. It was a series of steel and concrete emplacements set up along the border of France and Germany between Switzerland and Belgium, and was touted as “impenetrable.” Just like the much earlier Myos Hormos *hydreumata*, the posts were spaced out from one another, close enough to defend each other, but without a connecting defensive wall. Although the effort ultimately proved to be a failure (the Germans bypassed the line by going through the Netherlands and Belgium), troops never attempted to storm the fortifications, and one could argue that the line itself was an untested success.⁵⁰ Hadrian's Wall, a traditional Roman *limes* set up in AD 122 along the northernmost boundary of the Empire, is another example of a line of fortifications along a border. The wall included small ‘fortlets’ positioned every mile which allowed access through the wall and were spaced out so that soldiers could get from one to the next quickly. These series of fortifications parallel the fortifications in the Eastern Desert because they were all visual lines of defense that enabled troops to move easily between the posts. The Myos Hormos stations provided the same outcome as steel and concrete fortifications through their consistent authoritative look, and the proximity of the stations provided accessibility for soldiers.

Fortifications laid out along borders were common, but internal *limites* could also exist. Any fortified road, including the roads from Myos Hormos and Berenike, could almost be defined as an internal *limes* if it assisted in patrolling a difficult area. However, the variation in the consistency of fort construction and the different distances between the *hydreumata* along these two roads show that the routes were distinctive from each other, even though they had similar amounts of traffic. The Berenike stations were placed only as close as they needed to be for the relief of travelers. Combined with their lack of consistent architecture, these stations did not visually demonstrate the authority of the Roman Empire to people inhabiting the desert. The Myos Hormos route filled the function of a show of force through its homogeneous fortified stations that were placed in close proximity to each other, which anyone traveling in the Eastern Desert could see. The road was an effective display of military activity, and it was even more intimidating when occupied, especially with soldiers.

Although the ships came into the harbors only at specific times of the year, there is evidence that the forts were used year-round. Traffic on the roads was heaviest during the summer, when exports went from the Nile to the Red Sea, and the late spring, when the ships returned.⁵¹ However, both Berenike and Myos Hormos had permanent settlements as well as some industry. Since the environment was hyperarid neither of these cities were able to sustain themselves completely, and so they

required supplies from the Nile region, which included water to supplement their wells. The Nicanor Archive, as the business records of a family that was involved in trade and supplied the ports and quarries with various items, shows that the goods carried to the ports included basic necessities such as food, drink, medicine, clothing, mats, and rope, which demonstrates that the ports were heavily dependent on the Nile valley for their provisions.⁵² Even though the routes had more business during the trading months, they needed to be used during the rest of the year as well, and the stations were therefore still useful.

The Roman Empire took a vested interest in the goods that were imported because they produced much income for the government through taxes and fees. The people that lived in the Eastern Desert—including indigenous people, nomads, and bandits—needed to be monitored by the Roman army. Military personnel were abundant in the Eastern Desert; ostraka found by archaeologists confirm that the army had a concentrated presence in the desert. Letters, both official and personal, provide some insight into the dealings of the stationed soldiers. Some soldiers were based in remote areas for long periods of time, which can be deduced from correspondence exchanged between them and their families. A letter written by a father to his son highlights the fact that stationed soldiers were not always able to purchase certain items where they were located and therefore needed supplies sent to them.

Πούπλις Α[...]ω[ι] τῶι υἱῶι πλεῖστα χαίρειν καὶ διὰ παντὸς ὑγιαίν[ει]ν μετὰ τοῦ ἀβασκάντου σου ἵππου. ἔπεμψά σοι διὰ Κουίντου ἵπποιατροῦ τὸν ἀνδρόμαχα καὶ τὴν ὄρνιθαν ὑλαία ἠψημέ- νην ἐπεὶ οὐκ ἵνει κρέας πωλούμενον. εἰάν χρῆζεις χαλκοῦ .. γράψεις μοι καὶ πέμψω σοι μετὰ οὗ ἐάν εὕρω ἀνθρώπου ἀσφαλοῦς. ἐρρωσθαί σε εὐχομαι μετὰ τοῦ ἀβασκάν- του σου ἵππου.⁵³

Publius to his son A[....]us(?), many greetings, and good health through everything, with your unenvied horse. I sent to you, via Quintus the horse physician, the man-fighter and the boiled wood-bird, since there is (?) not meat being sold. And if you need bronze..., you will write to me and I will send you (it) with a trustworthy man, if I find one. I bid you farewell, with your unenvied horse.

The references to the son's horse at the beginning and the end of the letter suggest that he was a cavalryman. Although we do not know exactly where he was stationed, he apparently contacted his father to obtain goods that were not available to him, such as meat, poultry, and metal (possibly money). Other letters record requests for money and furlough passes, which

could suggest that the soldiers stayed in their remote postings for longer lengths of time than they originally anticipated.

Although the daily duties of the soldiers involved keeping civic order and enforcing the collection of taxes, they could also put down uprisings against the Empire if necessary. Military resources were used to support economic activity because trade provided the Empire with revenue. The potential wealth attracted bandits, who in turn created turmoil in the province and plagued the entire Empire so greatly that it was necessary to use the army against them.⁵⁴ The military presence provided protection to the merchants, and demonstrated to the potentially malcontent populations that the desert was securely in the hands of the Romans. The Myos Hormos route cut through the center of the desert, in between the northern quarries which were well guarded, and the southern border, which had three cohorts stationed along it, which placed the system of stations in a mutually supportive position. The center was built up to tie in the northern defenses with the cohorts in the south. Multiple strong points spread out like this provide support to each other and help defend each other. The well-constructed and dense line of stations along the Myos Hormos to Koptos route was just like a *limes* that protected the border of the empire from outsiders through a show of force, except that it protected the inside of the province from internal problems at a critical point dividing the desert. Groups aspiring to raid the caravans were not able to miss the tight knit stations that housed soldiers and that could be reinforced quickly when necessary. The combination of the consistent fortified architecture, the close placement of the stations, and the presence of soldiers along the route created an intimidating line that showed the authority of the Romans in the area.

The important part of the overall strategy was how the stations worked together to create the *limes*. Individually, each station was placed where a well could be dug or a cistern could collect water, rather than where it had a military advantage. The stations were generally placed in the sandy bottoms of the wadis, instead of at high points on top of the wadi ridges, which would have been the best placement for defense.⁵⁵ However, the lack of individual military strategy did not ultimately matter, since the stations along the Myos Hormos route never needed to sustain long-term defenses due to the fact that each could be warned in advance of disturbances by the watchtowers, and reinforcements could arrive in less than a day. The close proximity of the stations meant that armed soldiers from the closest stations could arrive in about half a day's march, even if they were burdened by heavy armor. The route was a defensive strategy that worked as a system, rather than as individual strongholds.

All of the routes within the Eastern Desert, including quarry roads and trade thoroughfares, provided certain necessities to their users: the towers could deliver messages if there were any problems that soldiers needed to deal with, and the stations provided water and shelter to the caravans, made escorts available, and guaranteed that traders did not dodge taxes on their goods. They also provided patrols for the desert. The policing by the military throughout the desert was exactly the type of service provided along *limites*, but the arrangement of the Myos Hormos stations—more tightly-knit than a purely mercantile trade route, such as the Berenike road, needed to be—truly made the route an internal *limes*.

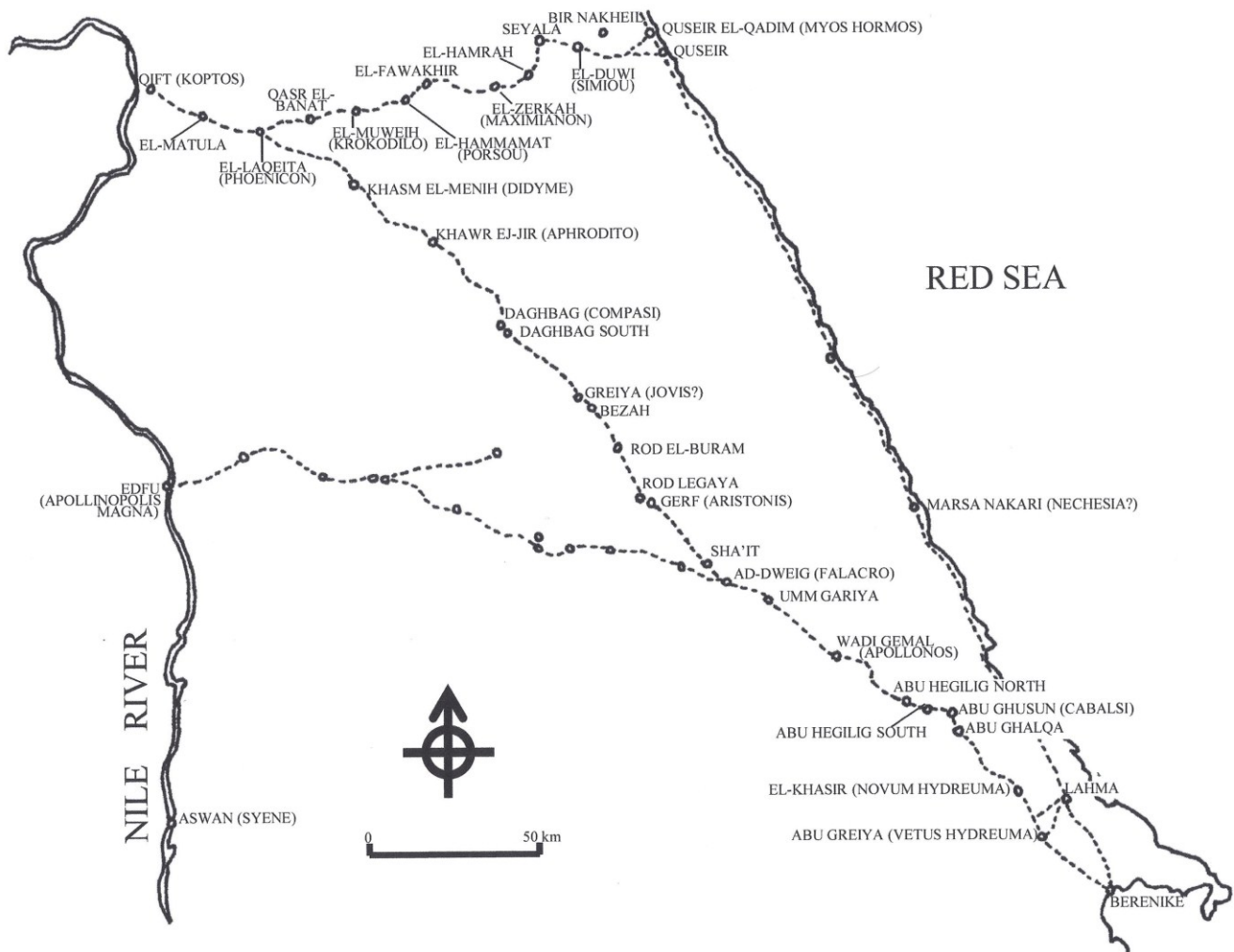


Figure 1: Map of the Eastern Desert trade routes
 [Adapted from Sidebotham and Zitterkopf 1995, fig. 2, and Zitterkopf and Sidebotham 1989, fig. 2]

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Notes

- ¹ Surveys and excavations have been carried out over the years by various teams of archaeologists along the coast and in the Eastern Desert. Numerous volumes have been published on the excavations at Berenike performed by the University of Delaware, and the Polish Centre of Mediterranean Archaeology at the University of Warsaw. Quseir, the likely site of Myos Hormos, has been excavated by several teams: the University of Delaware, the University of Chicago, and the University of Southampton. The latest extensive studies of the route from Quseir to Qift (ancient Koptos) were undertaken by the University of Delaware, and by the *Institut Français d'Archeologie Orientale*. Abundant ostraka and papyri recovered from various sites provide information about the everyday operation of the army and the mercantile system. The Nicanor Archive, which dates to between 18 BC and AD 69, is one of the most significant ostracological records. They are the business records of a family that was involved in trade and supplied the ports and quarries with various items (Young 2001, pp. 7, 57-58). Additional groups of ostraka and papyri were found at Berenike, which are primarily concerned with trade, and at Quseir el-Qadim, which are mostly unofficial (Bagnall 1986, pp. 11-15; Bagnall et al. 2000, vol. 1; vol. 2). Numerous ostraka have been found along the routes as well.
- ² Koptos, modern Qift, was the best end point for the trade routes because it was situated at the point on the Nile which is closest to the Red Sea. This location made it an important stop during the Ptolemaic and Roman periods for the transportation of trade goods from India, which were shipped to Alexandria and thence distributed throughout the rest of the Mediterranean world (Herbert 1999, pp. 656-657).
- ³ Strabo *Geo* 17.45. In addition to book seventeen of Strabo's *Geographika*, other primary literary sources that refer to trade via the Eastern Desert include the *Periplus Maris Erythraei*, book six of Pliny the Elder's *Historia Naturalis*, Diodorus Siculus, Flavius Josephus, Appian and Cassius Dio.
- ⁴ Cuvigny 2006, pp. 321-333.
- ⁵ Jackson 2002, p. 105.
- ⁶ Sidebotham 1989, p. 496.
- ⁷ Jackson 2002, p. 86; Wild and Wild 2005, p. 11; Cappers 2006, p. 16. Berenike was the most important port in southern Egypt, which was described by Strabo as having "no harbor, but good landing places, because the isthmus is conveniently situated" (*Geo* 17.45). The ruins lie just south of the Ras Banas peninsula, which is not near an isthmus, contrary to Strabo's statement. His confusion was likely due to a passage from Diodorus, which states that ships were carried overland to the other side of the sea. Since Strabo did not journey to Berenike himself, he probably interpreted the locale as an isthmus (Knight 1998, pp. 308-309).
- ⁸ Wendrich et al. 2003, p. 49. The harbor was located to the southeast, on a rise about seven meters above the level of high tide, and it still follows the same contour as it did in antiquity. The central part of Berenike covered an area of about seven hectares, but its maximal extension may have been as much as two square kilometers. The Late Roman period town was laid out on an orthogonal grid plan. The archaeological remains preserve a number of stairs, which suggest that at least some of the buildings were two stories tall; they probably served a commercial purpose, possibly as storage for high-value goods. The houses were mostly constructed of coral head blocks, white gypsum, igneous cobbles, and brick made of salty sand. Tents were also likely used as temporary residences (Jackson 2002, p. 86-87; Cappers 2006, p. 17; Tomber 2008, pp. 61-62; Sampsell 2003, p. 163).
- ⁹ Wendrich et al. 2003, p. 49; Tomber 2008, p. 64-65.
- ¹⁰ Bagnall and Rathbone 2004, p. 291; Cappers 2006, p. 15.
- ¹¹ Sampsell 2003, p. 163. The archaeological evidence for

the goods that traveled through Berenike comes from documents, containers, and trash dumps. These last can potentially preserve a large number of organic materials; the early Roman trash dump especially, which is located high above ground water level, has provided much of the evidence for the perishables that were in abundance in Berenike, including seeds, textiles, baskets, matting, cordage, leather, animal bones, and papyri (Wendrich et al. 2003, pp. 51-52). Cappers (2006) provides a detailed account of the botanical remains found at Berenike.

- ¹² Bagnall and Rathbone 2004, p. 290; Cappers 2006, p. 17.
- ¹³ This is supposing an average of five people per household. However, since many buildings were not well preserved, this is a conservative estimate. The population must have fluctuated greatly over time (Cappers 2006, p. 17).
- ¹⁴ Bagnall 1986, p. 3. The placement of Myos Hormos at Quseir el-Qadim was debated for some time, but it now appears to be certainly correct. Due to the lack of Ptolemaic remains, Quseir el-Qadim was previously identified as Leukos Limen based on a description given by Claudius Ptolemy and some texts found at the site that appear to refer to Leukos Limen. Abu Sha'ar was thought to be the most likely site of Myos Hormos, since it was sizable and appeared to fit the description given by Strabo. However, an inscription at the site clearly placed the foundation of Abu Sha'ar in the third century AD, which confirms that it cannot be the location of the early Roman port (Young 2001, pp. 35-38). The strongest evidence that ancient Quseir was Myos Hormos is the fact that modern satellite photographs show that Quseir el-Qadim once had an inland lagoon with three islands, which was connected to the sea by a curved channel. This matches the descriptions of the harbor provided by several ancient writers. Other features fit as well: it is exactly 1800 *stadia* distant from Berenike, red mountains are located outside of the town, and the road that leads to Koptos was clearly important since it was built up with fortified watering stations (Peacock 1993, pp. 226-230. The writers that provide these clues include Agatharchides of Knidos, Diodorus Siculus, Strabo, Pliny the Elder, Claudius Ptolemy, and the *Periplus*).
- ¹⁵ Strabo and Pliny estimate that Myos Hormos was founded at the same time as Berenike (*Geo* 16.4.5; *NH* 6.168), and one coin found at Quseir el-Qadim from the reign of Ptolemy III (246-222 BC) might support a third century BC date. At the beginning of the twentieth century, archaeologists reported the remains of a Ptolemaic temple at the site, but nothing remains of it today, and modern excavations have discovered only a few coins that date to the second and first centuries BC, along with some intrusive sherds of Ptolemaic pottery (Young 2001, p. 36; Bagnall and Rathbone 2004, pp. 289-290; Tomber 2008, pp. 60, 64).
- ¹⁶ Tomber 2008, pp. 64-65. The town itself is difficult to match up to ancient descriptions, since so little of it remains. The buildings were apparently constructed of local white limestone and some mudbrick. The streets appear to have run parallel to the coast, and the harbor was located to the southeast of the town. This harbor was difficult to keep clear of sediment buildup, and had to be dredged frequently. During the third century the harbor silted up, contributing to the abandonment of Myos Hormos (Jackson 2002, pp. 81-83; Tomber 2008, pp. 60, 64).
- ¹⁷ Sidebotham 1986, p. 17; Jackson 2002, pp. 82-83.
- ¹⁸ Jackson 2002, pp. 100, 106. Strabo notes that the journey from Myos Hormos to Koptos was six or seven days, and Pliny calculates that the Berenike to Koptos route took twelve (Strabo *Geo.* 17.1.45; Pliny *NH* 6.26). Although the distance from Berenike to the Nile was shorter at Syene (Aswan), a road was not established between the cities, probably because Syene was too close to the often unstable Nubian border (Sampsel 2003, pp. 163-164).
- ¹⁹ Tomber 2008, p. 63.
- ²⁰ Jackson 2002, p. 86; Cappers 2006, pp. 11-12.
- ²¹ Alston 1998, p. 31; Tomber 2008, p. 64.
- ²² Zitterkopf and Sidebotham 1989, pp. 180-187; Jackson 2002, p. 101; Cuvigny 2006, p. 207.
- ²³ Zitterkopf and Sidebotham 1989, pp. 173-178; Jackson 2002, p. 99; Cuvigny 2006, pp. 54, 79, 91-97, 100-107, 127-128, 133-135, 150-154, 156, 236.
- ²⁴ Zitterkopf and Sidebotham 1989, pp. 175-176; Cuvigny 2006, pp. 129-131, 136-137.
- ²⁵ Zitterkopf and Sidebotham 1989, pp. 173, 179; Cuvigny 2006, pp. 73-74, 138-140.
- ²⁶ Zitterkopf and Sidebotham 1989, pp. 179-180.
- ²⁷ It was previously assumed that this site must have been contemporaneous with the other stations on the route, and that the sizable town itself provided protection to the caravans passing through. However, the surveys conducted by the Oriental Institute of the University of Chicago proved that none of the buildings date to a period any earlier than the fifth century AD (Meyer 1994, pp. 37-53; Meyer 2007).
- ²⁸ Pottery sherds that date to the Roman period were scattered around this spot, and other ostraka found in

the area of Bir Umm Fawakhir predate the Byzantine era as well, including some that suggest business was conducted between Krokodilo, Maximianon and Fawakhir (Meyer 1994, pp. 37-49; Cuvigny 2006, pp. 98-99). Since the quarries were very likely Roman, a parallel can be drawn to other settlements near mines and quarries that included a fortified station, such as Bi'r Nakheil.

- ²⁹ El-Laqeita is an excellent source of water even now; the water table in many areas is only two or three meters below the surface (Zitterkopf and Sidebotham 1989, p. 179).
- ³⁰ Alston 1998, p. 194.
- ³¹ Alston 1998, pp. 199-200.
- ³² Cuvigny 2006, pp. 187, 192-202.
- ³³ Alston 1998, p. 194; Meyer 2003; Wright 2003, pp. 229-231; Cuvigny 2006, p. 236.
- ³⁴ Wright 2003, pp. 229-231; Cuvigny 2006, p. 236.
- ³⁵ Sidebotham and Zitterkopf 1995, pp. 48-50; Wright 2003, pp. 229-231; Cuvigny 2006, p. 236.
- ³⁶ Cuvigny 2006, p. 236.
- ³⁷ Jackson 2002, p. 106; Cuvigny 2006, pp. 78, 197, 236.
- ³⁸ Sidebotham and Zitterkopf 1995, pp. 44-45; Meyer 2003.
- ³⁹ Sidebotham and Zitterkopf 1995, pp. 43, 46; Meyer 2003.
- ⁴⁰ Sidebotham and Zitterkopf 1995, p. 46.
- ⁴¹ Sidebotham and Zitterkopf 1995, pp. 42, 45; Meyer 2003.
- ⁴² Sidebotham and Zitterkopf 1995, pp. 45-46; Sidebotham 1999, p. 683.
- ⁴³ Sidebotham and Zitterkopf 1995, p. 45; Meyer 2003.
- ⁴⁴ Sidebotham and Zitterkopf 1995, pp. 48, 50.
- ⁴⁵ Ancient references to the stations support this enumeration of the major stations. Pliny the Elder, in his *Natural History*, composes a list of stops on the route: "Two thousand paces (two miles) away from Alexandria is the city of Juliopolis; then they navigate on the Nile 309 miles to Koptos, which voyage is accomplished when the Etesian winds are blowing in 12 days. From Koptos one journeys by camel with the stops determined by a network of watering places: the first, 22 miles away, is called Hydreuma; the second, in

a mountain, is a day's journey; the third, in another Hydreuma, is 85 miles from Koptos; the next is in a mountain; soon one reaches Apollonos Hydreuma 184 miles from Koptos, again in a mountain; soon Novum Hydreuma, 230 miles from Koptos. And there is another, Vetus Hydreuma—named Trogodyticum, where a detachment keeps watch with lodging for two thousand; it is seven miles distant from Novum Hydreuma. Then one reaches the city of Berenike, where there is a harbor of the Red Sea, 257 miles from Koptos. But since the greater part of the journey is accomplished at night on account of the heat and days are spent at the stations, the total journey from Koptos to Berenike is accomplished on the twelfth day" (Pliny *NH* 6.26).

- ⁴⁶ Adams 2007, pp. 49-58.
- ⁴⁷ Maxfield 1996, pp. 11-12; Zitterkopf and Sidebotham 1989, p. 170.
- ⁴⁸ The distance between Berenike and Qift is 365 kilometers, which divided by ten stations leaves 36.5 kilometers as an average distance (Sidebotham 1995, pp. 42-43).
- ⁴⁹ The definition for a show of force can be found in FM 1-02, p. 1.170.
- ⁵⁰ Stokesbury 2001, pp. 25-26.
- ⁵¹ Jackson 2002, p. 105.
- ⁵² Young 2001, pp. 7, 57-58.
- ⁵³ This is from the collection of Florida ostraka, which unfortunately does not have a secure date or provenience (although it is possible the ostraka date to the second century AD and were discovered in Edfu) (Bagnall 1976, pp. 1-5, 54; http://papyri.info/navigator/text/ddbdp_0027_:15).
- ⁵⁴ Shaw 1984, pp. 6-12.
- ⁵⁵ For example, el-Matula, the last stop on both the Myos Hormos and Berenike routes, was placed on the northern edge of Wadi el-Matula, which meant that it was difficult to defend because of the rolling hills to the north (Zitterkopf and Sidebotham 1989, p. 179).