The Indian Ocean Trade and the Roman State

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Abstract

Imperial Roman trading activity within the Indian Ocean has received increasing attention from scholars during the last few decades, much of it considering the role played by the Roman state. These studies have convincingly shown that state involvement was motivated, primarily, by the lucrative revenue that could be obtained via taxation and this thesis takes this as the foremost reason for state participation. Despite this strong motivation the nature of the relationship between the Roman state and the Indian Ocean trade is debated. On the one hand, scholars such as Nappo, Wilson, Bowman, Cobb and Sidebotham see this relationship as one of intimate and often proactive involvement. This included the provision of facilities that were vital for trade and the deployment of the military to support commercial activity. On the other hand, while Young has recognised the extensive state provision of roads, ports, and the military he views the nature of state involvement as fundamentally reactive and limited in some cases to little more than monitoring activity.

It is due to these essentially contradicting positions that the aim of this thesis is to explore the nature of the relationship between the Indian Ocean trade and the Roman state and to examine the mechanisms by which the state interacted with this important sector of the economy. This will be achieved through considering the involvement of the state (using a large portion of Egypt's military garrison) by providing security and potable water in the Eastern Desert and the Red Sea and how these activities were supervised by officials in the region. Through this analysis it will be proposed that a more nuanced understanding of the Roman state's relationship with the Indian Ocean trade which combines both the proactive and reactive perspectives should be adopted. This will help to improve scholarly understanding of the relationship between the Roman state and the economy during the imperial period and will raise important questions that should be perused by subsequent research.

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Contents

Introduction

It is a 'chicken-and-egg' argument as to whether the lucrative "India-Arabia" trade as conducted by independent businessmen led to Roman governmental involvement to promote it further, especially after the annexation of Egypt in 30 B.C.[1]

Trade between the Indian Ocean and the Mediterranean Sea has been conducted via Egypt since at least the 2nd millennium BC, centuries before Rome asserted its hegemony over the region.[2] While the preceding period of this trade is often underappreciated, it is undeniable that with Roman involvement came a previously unprecedented level of expansion in the scale and investment in commercial activity.[3] These developments made certain goods, such as black pepper, available to a much wider consumer base within Mediterranean society than had previously been the case.[4] As a result, it is becoming increasingly clear to scholars that the Indian Ocean trade had a significant impact on Roman society.[5] While the Roman state's support and involvement in this trade is universally recognised the nature of its relationship to this major intercontinental trade remains an important, open-ended and debated question. Obtaining a deeper appreciation of this relationship would therefore have important implications for both our understanding of the sophistication and the practical

[1] Sidebotham, 2015, p.915-916.
[2] Sidebotham, 2011, p.24.
[3] On Ptolemaic trade in the Indian Ocean see Seland, 2008, p.71; Salles, 2015, p.251-268; Cobb, 2018a, p.28-60; 2018b, 17-51. For the nature of the expansion of the trade in the late 1st century BC see Tomber, 2008, p.18; 3013, p.114; Tchernia, 1997, p.261; McLaughlin, 2010, 24-28. While Cobb, 2018b, p.34 rightly acknowledges the expansion of Mediterranean involvement in the Indian Ocean under Rome he is also correct to caution that this should be viewed as a continuation of earlier Ptolemaic efforts rather than a separate development.
[4] Cobb, 2018c, p.519-559.
[5] Morley, 2007, p.39 has argued that the trade was small and comprised mainly of luxuries. However, Morley, 2008, p.573-574 has argued that not all items were luxuries and that the amount of money invested into the Indian Ocean trade shows that it was a significant part of the Roman economy. In contrast, Sidebotham, 1986, p.14 and Cobb 2013, p.136-152; Cobb, 2018c, p.519-559 have proven that many goods from the Indian Ocean were viewed as important necessities by imperial Roman society.

capabilities of the Roman state and its contemporaries regarding the affairs of the ancient economy.[6]

The Roman State and the Indian Ocean Trade

The nature of the Roman state's relationship with the Indian Ocean trade is viewed in essentially one of two ways. The first of these, which is held by Evers, Cobb, Wilson, Bowman, Nappo and Sidebotham, suggests that the state was intimately and, to some degree, proactively involved in the Indian Ocean trade. This, they propose, was done through the provision of facilities such as roads and harbours and by deploying the military to provide security in the Eastern Desert and the Red Sea.[7] The second perspective, which is supported by Young takes the stance that while the Roman state did make large investments in infrastructure to support the trade, beyond this, the nature of its relationship was limited and characteristically reactive. Indeed, Young goes one step further and argues that, other than seeking to obtain revenue, Rome practised no state policy regarding commercial activity either in Egypt or the whole of the East.[8] In contrast, Nappo, who expands on work by Sidebotham, takes the first of these two views one step further and proposes that Trajan instigated a state policy which sought to make the Red Sea a '*mare internum*' and provide a context which was appropriate for the expansion of Indian Ocean commerce.[9] For Nappo, the primary markers of this policy were (1) the creation of a Red Sea fleet, (2) the annexation of Nabataea, (3) the restoration of the canal connecting the Red Sea to the Nile and (4) the occupation of the Farasan Islands.[10] While Fitzpatrick makes a valid point that Rome would struggle to control the entirety of the Red Sea

[6] Finley, 1999 has argued that ancient states had very limited to no involvement in economic affairs. This influential view is now changing due to recent volumes such as Wilson and Bowman, 2017, *Trade, Commerce, and the state in the Roman World*. Similarly, Schörle, 2017, p.154 has noted that in academia there has been a shift away from the so-called primitivist and modernist models and towards institutional and network analysis.
[7] Wilson and Bowman, 2017, p.2; Sidebotham, 1986, p.113; Adams, 2007, p.197; Cobb 2018a, p.126. Gurkkal, 2013, p.183 even proposes that Rome's Indian Ocean trade was wholly under the patronage of the Emperor.
[8] Young, 2001, p.216; 219-2220. The East in this case refers to Egypt, Arabia, Palmyra, and Syria.
[9] Nappo, 2015a, p.71-72; 2016, p.124-125; Sidebotham, 1986, p.113-175. Sidebotham rightly cautions that the term 'policy' can only be applied retrospectively. Speidel, 2015, p.97-99 takes a similar view to Nappo on the attempt to create a *mare internum*.
[10] Nappo, 2015a, p.69. De Romanis, 2015a, p.125 observes that unlike previous canals connecting the Nile valley and the Red Sea Trajan's canal was continuously maintained. Cooper, 2009, p.197 takes a similar if speculative view although he is unsure if the canal of Trajan did function continuously. Aubert, 2015, p.37 notes that this project may have been funded by a special one-off tax. This could therefore be indicative of further state support for economic activity in Eastern Egypt.

by military means Sidebotham and Nappo's arguments are nonetheless an intriguing premise.[11] Despite this, as the quote above states, Sidebotham himself sees it as impossible to determine conclusively if the Roman state proactively promoted an expansion of the Indian Ocean trade. This is, at least based on the current state of the evidence, a reasonable stance for Sidebotham to take. However, it is still possible, to offer an alternate interpretation of state activity. This combines the two previous scholarly positions and, as a result, offers a more nuanced understanding of state involvement that was crucial for creating an environment that permitted Roman trade in the Indian Ocean to continue and even, to flourish.

Approach, Scope and Aim of the Thesis

It has been acknowledged that no known or available evidence proves, one way or the other, that the Roman state proactively promoted the growth of the Red Sea branch of the Indian Ocean trade which fell in its orbit.[12] Nevertheless, the evidence does suggest that the state had a substantial motivation for ensuring at least the stable continuation of commercial activity. This thesis will not, therefore, undertake an insightful but retrospective examination of the efforts of the Roman state to stabilise and potentially to expand Mediterranean trade with the Indian Ocean. Similarly, it will not endeavour to discuss state involvement exclusively in terms of proactivity versus reactivity. Indeed, it will be seen throughout that understanding state involvement exclusively through one or other of these terms is potentially reductive. Instead, this thesis will attempt to demonstrate that measures which the state gradually expanded or put in place (such as increased security) were often introduced in reaction to a change in the situation but were likely implemented to proactively ensure something in the future. This future something and the reason for the state to implement or expand any such measures, it will be demonstrated below, is correctly observed to have been the potential to acquire immense quantities of revenue for the imperial *fiscus* (treasury) from Indian Ocean commerce. The Roman state appears to have appreciated this situation shortly after conquering Egypt.[13] This

[11] Fitzpatrick, 2011, p.52. Nappo, 2009, p.71-75 demonstrates that similar Roman activity was undertaken from the 4th century AD. This makes Nappo's proposition more likely. Nappo, 2015a, p.71 explicitly recognises that Rome sought to 'control if not directly rule the Red Sea.'

[12] Gregoratti, 2018, p.52-72 has sought to consider the role that Parthia played in the Indian Ocean trade and the importance of the southern Mesopotamian ports and Seland, 2011, p.398-406 has even argued that the India to Persian Gulf route was significantly faster than the Red Sea equivalent.

[13] Aside from Strab.2.5.12 implying that trade had increased dramatically by the end of the 1st century Gates-Foster, 2012a, p.200 notes an increase in site usage in the Eastern Desert at the same time. This certainly implies that the Roman state acted quickly to assert itself over economic activity in a region which had been largely

revenue was obtained via a series of taxes, the most important of which was the *tetarte*, a 25% import tax on all of the Indian Ocean goods which entered Roman territory.[14] It is also possible, as Strabo suggests, that a double duty (τέλη διπλάσια) was in place and a second *tetarte* (also 25%) was levied on Indian Ocean goods as they left Egypt.[15]

Taking a desire to continuously collect this lucrative tax as the rationale for state action the scope of this thesis will examine those aspects of state involvement that were often implemented reactively but can reasonably be asserted to have been employed to proactively ensure the future collection of this revenue. That the Roman state knew to put in place measures to achieve their goal of exploiting the large revenue potential of the Indian Ocean trade could have come from accessing Ptolemaic information once their forces had arrived in Alexandria.[16] Indeed, it is possible that with the *tetarte* Rome was reinstating a Ptolemaic precedent with the earlier administration being estimated to have taxed the Indian Ocean trade at between 25 and 50%.[17] To this end Chapters, I and II will outline the scale of Rome's military deployment in the Eastern Desert and the Red Sea and the efforts that were made to provide security in the region. Chapter III will then examine how and by whom potable water was made available in a desert environment and, finally, Chapter IV considers the management of these and other activities by state officials who reported to higher levels of Rome's central government. Consequently, the purpose of this thesis will not be an explicit attempt to contribute to the debate on Roman policy in the Red Sea. Instead, it aims to better understand the nature and mechanisms of state interaction with an area of the Roman economy in which the state appears to have been involved to an unusually high degree. The result will, it is hoped, provide a fresh perspective on the economic capabilities of the Roman state during the imperial period which is sometimes seen as being strictly limited to overseeing coinage, guaranteeing grain rations

isolated from state control since the Great Revolt (207-186 BC). On this time see Gates-Foster, 2012a, p.199-203.

[14] Rathbone, 2000, p.49; Young, 2001, p. 52; 66-69; Wilson, 2015, p.22-24.

[15] De Romanis, 2020, p.123-133; Strab.17.1.3.

[16] This is not to suggest that Rome was unaware of the Indian Ocean trade before this. Indeed, Plin.*NH*.9.123. shows that low grade pearls were known in Rome by the time of Sulla (138-78 BC) and Cobb, 2018c, p.538 notes that peppercorns from the Republican era have been found in the so-called 'House of Heracles Wedding' in Pompeii.

[17] Sidebotham, 2011, p.34. De Romanis, 2020, p.133 argues that the *tetarte* was a Ptolemaic legacy. Indeed, *SB* 3.7176; 6.9090; 6.9416; *O. Cair*. 20 show that unguents were taxed at 25% throughout the 3rd century BC. Whittaker, 2004, p.163; 167 and McLaughlin, 2010, p.26 has argued that during the Ptolemaic period the royal family held a monopoly over the Indian Ocean trade. This suggestion has since been disputed by Bowman, 2010, p.104; Sidebotham, 2011, p.34; Cobb, 2018b, p.47. That the Roman state needed to assert its authority over the trade is indicated by the earlier Ptolemaic loss of control during the time of the Great Revolt (207 to 186 BC) during which time Gates-Foster, 2012a, p.200-202 observes that trade continued without the involvement of the central state in Alexandria.

for the populace of Rome itself, ensuring supplies for the army and intervening in economic affairs only in extreme circumstances.[18] However, it is also hoped that, by discussing a comparatively well-documented area of economic activity in provincial Egypt, a region that held a special administrative status within the empire, that the results can also raise new questions about state economic practice across the wider span of the *imperium romanum*.[19]

The Roman State and Indian Ocean Trade Revenue

The economic potential of the Indian Ocean trade for Rome's *fiscus* has already been observed.[20] It was also established that this was due to the 25% import tax on Indian Ocean goods travelling through the Red Sea ports and possibly a further 25% tax as these goods left Egypt. Moreover, the Muziris papyrus, a copy of a ship's loan dating to the 2nd century AD indicates that the resultant tax take on one ship's cargo equated to at least two if not four million sesterces.[21] For Evers, this factor alone constitutes a suitable reason to re-evaluate state involvement in the Indian Ocean trade.[22] Considering therefore that the Roman state could, undoubtedly, acquire extensive revenue from taxing the Indian Ocean trade the suggestion that this constituted the primary motivator for state involvement seems beyond doubt.[23] On the other hand, it is unclear exactly how much tax revenue the *tetarte* raised in a single year. As a result, various estimates have been proposed. These have ranged from Young's suggestion that the *tetarte* was worth a modest 25 to 50 million *sesterces* per year to the Roman state to McLaughlin's proposal that the Indian Ocean trade returned 270 million *sesterces*. This, McLaughlin suggests, paid for approximately one-third of the Roman army.[24] Additional

[18] Lo Cascio, 2008, p.626-629 has argued that the state was the driving force behind the monetization of the empire and Bowman, 2017, p.29 lists control of the currency as one means by which the Roman state could influence economic behaviour within its borders. Tchernia, 2016, p.97-98; Plin.*NH*.13.89 states that during the reign of Tiberius action was taken in Rome to preserve supplies of papyri.

[19] On the special status of Egypt see Appendix I. Morley, 2009, p.115-116 has expressed scepticism that the evidence from Egypt is representative of the rest of the empire. For discussions of the available evidence see Young, 2001, p.5-14; Cobb, 2018b, p.18-27.

[20] Young, 2001, p.69; Wilson, 2015, p.22.

[21] *P. Vindob*.*G*.40822. Wilson, 2015, p.23. De Romanis, 2020, p.318 assumes that 43.75% of the Hermapollon's cargo was taken in tax. This equated to 4 million sesterces. De Romanis bases this assessment on Strabo's claim (17.1.3) that 'double duties' were in place on the Indian Ocean trade.

[22] Evers, 2017, p.111.

[23] It is also very likely that the increasing societal demand for goods from the Indian Ocean was also a motivator for the state to take a hand in ensuring that trade continued. This may be seen clearly in the case of pearls which Schneider, 2018, p.139-144 convincingly shows went from being a little-known commodity to one which was desperately sought after in Roman society.

[24] Young, 2001, p.210; Mclaughlin, 2010, p.164. However, McLaughlin, 2014, p.19 suggests that the Indian Ocean trade returned 250 million *sesterces* in taxes while McLaughlin, 2019, p.125 returns to the estimate of

suggestions by Speidel, Wilson and Bowman places the value of the *tetarte* on a similar order of magnitude.[25] However, these estimates rely on combining several strands of evidence. These include figures for the cost of the trade stated by Pliny the Elder, the number of ships sailing from Myos Hormos cited by Strabo and the amount of tax, which was levied on the Hermapollon, the ship referenced in the Muziris papyrus.[26]

Due to the diverse nature and range of these sources, the estimates which they have been used to create have rightly been challenged. These have included highlighting the moral context of Pliny's figures, questioning the assumed typicality of ships like the Hermapollon and questioning the very rounded number of vessels supplied by Strabo.[27] Regardless of the exact year-to-year value of the Indian Ocean trade to the Roman state that it was economically lucrative is made clear by the Muziris papyrus. Moreover, archaeological evidence, literary references by contemporaries and numismatic finds confirm that the trade between Egypt and other regions of the Indian Ocean was conducted on a very large scale.[28] This would certainly, therefore, have guaranteed tens if not hundreds of millions of sesterces in revenue for the Roman state each year at least until a decline in the 3rd century AD.[29] Furthermore, while Indian Ocean goods came to be a valuable social currency within Roman society this revenue, as Young rightly argues, remained the primary motivator for state support.

270 million *sesterces*. McLaughlin, 2015, p.199-200; 204 suggests that the *tetarte* raised an additional 90 million from trade passing through Syria.

[25] Speidel, 2015, p.105; Wilson, 2015, p.23; Wilson and Bowman, 2017, p.15. Scheidel, 2015, p.160 has estimated that the Indian Ocean trade could have raised 119 million *sesterces* per year and Seland, 2008, p.74 places the value around 100 million *sesterces*. Most recently, while De Romanis, 2020, p.318 has calculated that taxes from the Indian Ocean trade could have been worth 500 million sesterces per year he cautions against making such estimates.

[26] Plin.*NH*.6.10; .12.84; Strab.2.5.12; *P. Vindob*.*G*.40822.

[27] Fitzpatrick 2011, p.31-32; Cobb, 2015a, p.191; Sealand, 2014, p.386; Parker, 2008, p.183-184; 187; Tomber, 2008, p.31; Young, 2001, p.182; Mclaughlin, 2010, p.160; Cobb, 2018a, p.46-47; De Romanis, 2020, p.126; 254.

[28] Cobb, 2015b, 372-378; 381. Appicius.1.1 shows that spices from the Indian Ocean were used in wine Mart. *EP*.1.87 indicates that malabathrum could be used to freshen breath and Pliny.*NH*.12.41.83 states that large amounts of incense were used for funerals across the empire. From an Indian perspective Tomber, 2013, p.116 notes that approximately 6,000 Roman pottery sherds have been found just at Pattanam (ancient Muzris).

[29] Nappo, 2007, p.237-238; McLaughlin, 2010, p.59-60. Tomber, 2013, p.114; 2017, p.531 has argued that many of Rome's Red Sea ports and sites in the Eastern Desert continued to be important into the 2nd and 3rd centuries AD.

I.

The Size of the Roman Military Deployment in the Eastern Desert and the Red Sea

> …the region was militarily important, and, in order to prevent incursions from nomadic tribes, there was a constant, if limited, military presence.[30]

As the quote from Adams suggests, a common feature of any study of the involvement of the Roman state in the Indian Ocean trade, and the most visible example of reactive action taken by the state to proactively ensure the collection of revenue are the military forces which were stationed in the Eastern Desert and the Red Sea.[31] These soldiers garrisoned *praesidia* (small forts) that lined the roads to the ports, guarded the quarries, acted as marines on naval vessels in the Red Sea and manned bases on distant islands, conducted small campaigns and prevented smuggling.[32] All of these tasks were crucial both for Rome's Indian Ocean trade and other economic activities that were conducted in the region. On the other hand, despite recognising the military's importance relatively few studies have discussed the number of troops that were involved in any detail.[33] As the opening quote for this chapter shows, some, such as Adams believe that the size of Rome's military presence in the area was limited although he does not say if this was limited in terms of Egypt's provincial forces or those of the wider empire.[34] On the other hand, while Maxfield has simply argued that a large number of soldiers were sent to the Eastern Desert Sidebotham has since suggested that as many as 1,000 men were stationed in and around the Red Sea port of Berenike by the end of the 2nd century AD.[35] Similarly, Van

[30] Adams, 2007, p.197.
[31] Young, 2001, p.69-74; Cobb, 2018b, p.108-112; 116-120; Maxfield, 2003, p.154; Adams, 2007, p.197; Hirt, 2010, p.180-182; Nappo, 2009, p.65-66; Speidel, 2015, p.89-93; Sidebotham, 2011, p.165.
[32] For the campaign of Aelius Gallus see Sidebotham, 1986, p.122-123; Speidel, 2015, p.97-99. On the garrisons in the Eastern Desert consult Young, 2001, p.69-74; Cobb, 2018b, p.111; 2019, p.89-90. Symonds, 2017, p.2.
[33] Maxfield, 2000, p.402-442 seems to be one of the few specifically on this topic but even then, only goes so far as to suggest that many soldiers were involved. However, it should be noted that this article was published prior to the discovery of subsequent material.
[34] Adams, 2007, p.197.
[35] Maxfield, 2000, p.409; Sidebotham, 2011, p.260.

der Veen, Bouchard, Cappers and Newton propose that between 500 and 900 men manned the *praesidia* and De Romanis has drawn attention to an inscription which mentions that 1,400 soldiers were used to construct wells.[36] If accurate this would have represented 10% percent of the military garrison of provincial Egypt during the time of Augustus and as much as 20% by the start of the 2nd century AD.[37] Speidel and Sidebotham have, moreover, drawn attention to additional units of cavalry and archers that were stationed at Coptos, the gateway to the Eastern Desert.[38] This could have dramatically increased this percentage.

However, these estimates do not account for the soldiers of the navy nor those that guarded the mines or were posted overseas. Given the importance of these duties, these troops must be added to an estimate of the size of Rome's state forces in the region. This chapter will, therefore, re-evaluate the size of the Roman deployment in the Eastern Desert and the Red Sea. It will first consider the issues presented by an attempt to assess the number of soldiers that were present and establish a suitable methodology. Following this, this chapter will sequentially establish the number of soldiers that were assigned to the *praesidia*, quarries, mines, ports, navy, the Leuke Kome customs-post and the Farasan Islands. Finally, some thought will be given to those units which Sidebothm and Speidel indicate were posted outside of the desert itself. Although this discussion, in and of itself, will indicate the level of support which the Roman state provided to the Indian Ocean trade and related activities it will help to contextualise the extent to which the state (via the military) could have actively enforced any measures that were intended to proactively secure revenue. These included the provision of security and the management and control of the water supply.[39] Additionally, as will be seen, the number of soldiers involved would increase over time. This shows that reactive action taken by the state to changing circumstances was likely done with proactive intentions.

[36] Van der Veen et al, 2018, p.359; De Romanis, 2020, p.51; *ILS* 2483. De Romanis, 2020, f.75 suggests that these troops were repurposed members of the Galatian army. Haynes, 2013, p.271-272 has argued that the difference between citizen legions and non-citizen auxilia became increasingly anachronistic.
[37] Pollard, 2004, p.211; Fischer-Bovet and Sänger, 2019, p.172; Tac.*Ann*.4.5; BGU I 140. For a detailed breakdown see Appendix III.
[38] Sidebotham, 2011, p.260; Speidel, 1984, p.221.
[39] See Chapter II on the issue of protection and security and Chapter III for a discussion of water management.

Calculating the Military Deployment

Previous studies have identified several methods for calculating the number of soldiers that were based in the Eastern Desert and the Red Sea. The first of these uses records of the amount of food that was delivered to the garrisons of the *praesidia*. Since soldiers during the imperial period had a fixed monthly grain ration this has enabled Adams to deduce that 215 soldiers garrisoned a single *praesidium*.[40] A second approach which has been outlined by Sidebotham, Hense and Nouwens attempts, firstly, to identify barrack buildings and, secondly, to calculate the number of soldiers which these buildings could have accommodated. Using this method Sidebotham and his co-authors propose that the *praesidium* of Abu sha' r housed between 150 and 200 soldiers.[41] However, while both of these examples are individually useful several problems become apparent when attempting to apply these methods to a wider assessment of military personal. In the first instance, Adams' method of using records of food deliveries to determine troop numbers, while certainly a valid approach, is curtailed by the absence of large quantities of such information.

On the other hand, the approach described by Sidebotham, Hense and Nouwens initially appears to hold greater promise for a larger analysis. This is akin to the Shotgun Method an approach outlined by Hansen which is designed to estimate the minimum and the maximum size potential of an ancient city's population.[42] The Shotgun Method, which builds on the work of Beloch, relies on tracing the perimeter of a city, usually via the remains of fortified walls, and estimates for the size of a typical Greek household to calculate the number of people that could have lived within this area.[43] Hansen has subsequently used this to estimate the population of every known *polis* during the Classical period.[44] However, Hansen's proposal, by his own admission, only offers a hypothetical series of numbers rather than a concrete figure. In addition to this, Wilson has highlighted that Hanson's calculations do not account for public spaces within the *poleis*.[45] Despite this Wilson expands upon Hanson's work and Sidebotham, in addition to the barracks at Abu sha 'r, similarly uses the housing district of Berenike to estimate (along with Wendrich) that its population numbered between 500 and 1,000 people during Late Antiquity.[46] On the face of it therefore the archaeological approach holds more

[40] Adams, 1995, p.122-124; 2007, p.213-214.
[41] Sidebotham et al, 2008, p.241-242.
[42] Hansen, 2006b, p.4.
[43] Hansen, 2006b, p.4; 32; 35; 2008, p.260; Beloch, 1886, p.388-443.
[44] Hansen, 2006a, P.32.
[45] Wilson, 2011, p.170-176.
[46] Sidebotham and Wendrich, 1998, p.85-96.

promise for calculating the number of soldiers that were deployed in the Eastern Desert and the Red Sea.

However, the discovery that civilians co-habited the *praesidia* alongside Rome's military personnel make such an approach problematic.[47] This is because although enough archaeological material survives for Reddé to estimate that these fortifications measured, on average, 40 to 50 metres square he also cautions that securely identifying the buildings which housed soldiers is difficult due to continuous modification and restoration efforts.[48] Moreover, while some *praesidia* such as Maximiaon are exceptionally well-preserved this is not always the case.[49] This makes recognising military buildings even more difficult. Indeed, identifying these buildings at Berenike is limited by the fact that only two percent of the site has been excavated.[50] Thus, considering this and the fact that these spaces were shared with civilians, attempting to identify barrack-like buildings in all but isolated cases is not currently a suitable method to determine the number of soldiers in the entire region.

In contrast, the methodology outlined by Van der Veen, Bouchaurd, Cappers and Newton sits in between the two previous approaches. This is because while it uses archaeology to determine how many *praesidia* were occupied it also utilises documents which preserve details of the size of their garrisons and the duty rotas that the soldiers used.[51] That such documents survive is, in part, due to the unique preservation conditions of the Eastern Desert.[52] Indeed, Egypt is, so far, the only region to have yielded census data from the imperial period.[53] In addition to the duty rotas, other documents have been discovered across the Eastern Desert and the Red Sea that offer additional important insights into the number of troops stationed at other locations such as the ports, quarries and overseas. This third methodology, therefore, which mostly employs documentary evidence but still utilises other relevant material such as archaeology, is perhaps the best means of reliably assessing the number of troops in the Eastern Desert and the Red Sea. Furthermore, this adaptive framework will allow this study to consider the number of soldiers involved with the navy and other activities.

[47] Cobb, 2018b, p.96; 99; Broux, 2017, p.150-151; *O. Did* 377; 379; 393.
[48] Reddé, 2018, p.194.
[49] Reddé, 2018, p.182.
[50] Sidebotham, 2011, p. 222; Sidebotham et al, 2008, p.199; Tomber 2008, p.24; Cobb, 2015a, p.363-390.
[51] Van der Veen et al, 2018, p.359.
[52] Sidebotham, 2011, p.79; Adams, 2007, p.197-198; Tomber 2008, p.24; 54-55; Sidebotham et al, 2008, p.312.
[53] Wilson, 2011, p.170.

The praesidia

It has already been established that the method which Van der Veen, Bouchard, Cappers and Newton have used to suggest that 500 to 900 men were stationed in the *praesidia* is promising. Indeed, Sidebotham suggests a similar number based on the discovery of an inscription found in Berenike which references a *chiliarch* ('commander of one thousand).'[54] This suggests that the proposed figure of 900 men manning the *praesidia* is potentially accurate. Van der Veen, Bouchard, Cappers and Newton's figure is based off the surviving duty rotas of these garrisons which, they suggest, numbered on average between 15 and 30 men. This figure probably included the two to four men which other documents show were involved in manning the *skopoloi* (watchtowers).[55] Furthermore, they propose that these troops were based in 30 separate *praesidia* spread across the Eastern Desert. These garrisons, moreover, seem to have often been comprised of a mixture of small units of infantry and cavalry.[56] Conversely, despite this comparatively reliable information how Van der Veen, Bouchard, Cappers and Newton calculated the number of *praesidia* that were actively garrisoned is not addressed.

A network of roads and forts stretching from the Nile Valley to the Red Sea coast appears to have been established during the 3rd century BC as part of infrastructural efforts by Ptolemy II. This was intended to be used by parties of hunters that were dispatched in search of elephants for use in Ptolemaic military expeditions.[57] However, the network of fortifications which was constructed seems to have been far smaller than the one which supported activity during the imperial Roman period.[58] These installations were also smaller and less uniform in shape than their later counterparts with the largest of these at Wadi Abu Greiya being remodelled following Augustus' conquest.[59] Even then, the Roman *praesidia* did not adhere to a single floor plan and were heavily modified.[60] Despite the detailed excavation of some *praesidia*, Sidebotham cautions that not all have been subjected to such examinations. This makes the dates at which these locations were occupied difficult to determine.[61] Moreover, while Brun's recent study has charted the chronology of the *praesidia* leading to Myos Hormos and Berenike he only gives an overview of their development and does not offer any precise dates for

[54] Sidebotham, 2011, p.260; Dijkstra and Verhoogt, 1999, p.208-218.
[55] Cobb, 2015a, p.377; Young, 2001, p.70; Zitterkopf and Sidebotham, 1989 p.183; *O. Amst*.14-18.
[56] Cuvigny, 2006a, p.307–310; *K*242; *O. Krok*. 1.
[57] Cobb, 2018a, p.29-32; Burstein, 1996, p.802; Charles, 2007, p.306-311; Sidebotham, 2011, p.29-31; Agath.1; Strab. 2.3.4; 17.1.25; 45 Pliny *NH* 6.33.167; 168; Strabo 16.4.4–5; Pithom Stele line 23.
[58] Sidebotham, 2011, p.143. Note also that the term *praesidia* is Roman rather than Ptolemaic.
[59] Sidebotham, 2011, p.143.
[60] Reddé, 2018, p.184; 206 Sidebotham, 2011, p.162-163.
[61] Sidebotham, 2011, p.150.

occupation.[62] This situation is further complicated by disagreements in the literary sources over the number of *praesidia* on certain roads.

In the case of the Coptos to Berenike road, Pliny states that there were eight stations while the Antonine itinerary and the so-called Peutinger table suggest that 10 were placed at intervals along the road.[63] While it could be that the Peutinger table is referring to *praesidia* that were constructed after Pliny's account other surveys have revealed an otherwise unknown *praesidium* on the same route. However, given the Hellenistic nature of the finds it likely had its origins within the Ptolemaic period.[64] Sidebotham, Zitterkopf, Peacock and Van der Veen initially believed that most of the *praesidia* were constructed and occupied under the Julio-Claudian dynasty.[65] However, this assertion was based on the results of earlier surveys of surface material along with ostraca and graffiti which date to the 1st century AD.[66] On the other hand, the work of the l'Institut français d'archéologie orientale (IFAO) has demonstrated that the *praesidia* underwent a major period of construction and refortification under the Flavians.[67] These efforts likely represented a reaction to a significant change of circumstances. Cuvigny and Brun, based on the comments of Strabo and the evidence for a major phase of building activity from the late 1st and into the 2nd century AD, suggest this indicates that formerly unfortified *lakkoi* (cisterns) were replaced by fortified *praesidia*.[68] The increase in fortifications during this period was likely part of a state response to a rising number of attacks by the *barbaroi* in an attempt to proactively defend the desert roads.[69]

That more of the *praesidia* were active from the start of the 2nd century AD onwards is confirmed by Sidebotham in his 2011 volume. This monograph utilises decades of additional archaeological data from subsequent expeditions and has allowed Sidebotham to modify the view outlined in his earlier 1986 work.[70] Using this enlarged data-set pottery sherds allow some 39 *praesidia* to be identified as having been active from the 2nd century AD onwards.[71] This confirms Van der Veen, Bouchard, Cappers and Newton's estimate and represents almost half

[62] See Brun, 2018, p.141-173.
[63] Cobb, 2018b, p.101; 103; Plin.*NH*.6.102-103.
[64] Sidebotham, 1999, p.364; Cobb, 2018a, p.101.
[65] Sidebotham, 1986, p.54; 2011, p.154; Sidebotham and Zitterkopf, 1989, p.165; Peacock, 2000, p.426; Van der Veen, 2011, p.8.
[66] Young, 2001, p.41; Cobb, 2019, p.98; *I. Pan* 87; *I. Koptos* 3; 38-39; 40-49.
[67] Cobb, 2019, p.102-105; 2019, p.98-100; Reddé and Brun, 2006, p.86; 90-91; 94; 98-99; 126; 137; Brun, 2006a, p.187; 200; Cuvigny, 2006b, 267-273.
[68] Cuvigny, 2006b, p.267-273; 2006b, p.253-257; Brun, 2006a, p.196; Cobb, 2015a, p.378; ILS 2483; *I. Pan* 68; *I. Did*.1; *I. Did*.2; Strab.17.1.53.
[69] Schneider, 2014, p.11; Cobb, 2019, p.100-103. On state efforts to provide security see Chapter III.
[70] Sidebotham, 1986, p.54; 2011, p.129-135.
[71] Sidebotham, 2011, p.129-135.

of the *c.*80 *praesidia* and stations which appear to have been occupied between the Pharaonic era and the Islamic periods in the territory to the east of the Nile.[72] Thus, to calculate the number of troops deployed in the *praesidia* it seems best to include only those sites which the archaeology suggests were inhabited from the 2nd century AD. This is firstly because it matches the chronology of the surviving rotas and because it avoids basing any, already inherently hypothetical, estimates on limited and conflicting literary evidence.[73] Using pottery to date the periods of occupation Sidebotham, as noted above, lists some 39 forts which were active during the 2nd century AD with some of these remaining in use until the 7th century AD.[74]

When this is combined with the troop rotas a minimum estimate for the number of soldiers manning the *praesidia*, based on 39 garrisons of *c.*15 soldiers per *praesidium* produces a figure of *c.*585 men.[75] In contrast, a maximum estimate based on garrisons of 24 soldiers per *praesidium* would mean that *c.*936 soldiers garrisoned the *praesidia*.[76] While Sidebotham, Adams, Maxfield, McLaughlin and Cobb have pointed out that the number of soldiers at each *praesidium* were not uniform both of these estimates align with those of Van der Veen, Bouchard, Cappers and Newton.[77] However, to account for the potential variations in the number of troops deployed to the *praesidia* it seems sensible to suggest an average garrison of *c.*20 men per *praesidium*. This gives an estimate of *c.*780 men manning the *praesidia*, on average, during the 2nd century AD. Despite being smaller than the upper estimate suggested by Van der Veen, Bouchard, Cappers and Newton their larger estimate may be more representative of the number of troops in the whole of the region. That this is likely the case is indicated, as was noted, by the inscription from Berenike referencing a *chiliarch*, an officer notionally in command of 1,000 soldiers. However, to reach this number it is necessary to consider the soldiers that were posted to other parts of the Eastern Desert and the Red Sea.

[72] Sidebotham, 2011, p.163
[73] Cobb, 2018b, p.95-96; 101; 103; *M*920.
[74] Sidebotham, 2011, p.129-135. Sidebotham, 2011, p.150 also suggests that there was a peak in the number of troops in the Eastern Desert during the first half of the 2nd century AD.
[75] Sidebotham, 2011, p.166; Cuvigny, 2005, p.3; 179; no.117. This ostracon indicates that 11-15 men were garrisoned at Krokodilo in 109 AD.
[76] Cobb, 2015a, p.377. See Sidebotham, 2011, p.166 for a summary of the evidence for the size of Roman garrisons prior to the discovery of duty rotas.
[77] Sidebotham, 2011, p.150; McLaughlin, 2010, p.32; Adams, 2007, p.197**;** Maxfield, 2003, p.160-163. *M*920 shows that 15 men were based at Maximianon 18 were stationed at Persou and 15 more at Simiou.

The Quarries and Mines

Obtaining gold ore was a primary focus for Ptolemaic mining operations in the Eastern Desert with metallurgical analysis demonstrating that gold from this area was used in the coin series of at least two of the dynasty's monarchs.[78] By the Roman period, however, while gold mining had declined the extraction of other minerals had expanded and *c.*130 locations have now been identified as having been exploited to various degrees.[79] Where some of these sites continued to mine for gold and others for precious minerals many of the newer sites were dedicated to quarrying rare and valuable types of stone.[80] Amongst these, the quarries of Mons Claudianus and Mons Porphyrites stand out, both for their size and sophistication, with Mons Claudianus possessing its own medical unit.[81] These locations appear to have operated intermittently between the 1st and the 3rd century AD and the 1st and the 5th century AD respectively.[82] The importance of Mons Claudianus and Mons Porphyrites stem, moreover, from their role as sources of 'imperial' purple porphyry, as well as black porphyry, hard granodiorite and tonalite.[83] These are all valuable types of stone that were used in fine sculpture, monumental buildings and the villa of Emperor Hadrian.[84] Such valuable materials seem to have necessitated military protection and, as a result, both Mons Claudianus and Porphyrites were established around fortified outposts and several *praesidia* seem to have also been situated nearby.[85] This placed both these quarries and several mines within easy reach of military support.

Aside from protecting valuable resources, a further potential need for soldiers to be posted close to these sites comes from an account by Diodorus of the Ptolemies hiring a contingent of mercenaries to oversee convicted criminals that worked in the mines. This well-known story has led some to question the status of the labourers in the Eastern Desert during the Roman period.[86] In supporting the view that Rome's labours were unfree Hirt has argued that the

[78] Brun, 2018, p.142-145; Klemm and Klemm, 2013, p.12-15; Fuacher, 2018, p.61-62; Gates-Foster, 2012a, p.194-195.
[79] Klemm and Kelmm, 2013, p.15; Hirt, 2011, p.184; Maxfield, 2002, p.155. Maxfield, 2002, p.143 identifies 70 quarry sites that were active at different times.
[80] Sidebotham et al, 2008, p.74; 78; 82-83; Reddé, 2018, p.183.
[81] Hirt, 2011, p.183; Le Bohec 1994: 52; *O. Claud*. 120; *O. Claud.* inv. 1538+2921, 2055, 2795+3739, 3260.
[82] Sidebotham et al, 2008, p.72; 77. For a discussion of when the major quarries were established see Maxfield, 2002, p.148. Cuvigny, 2014, p.166 argues that Mons Claudianus was active from the time of Claudius or Nero until the time of Severus Alexander. In contrast, she suggests that Mons Porphyrites was opened under Domitian, quickly abandoned, and then briefly reoccupied under Antonius Pius.
[83] Maxfield, 2002, p.143; Sidebotham et al, 2008, p.74; 78; 82-83.
[84] Sidebotham et al, 2008, p.74; 78; 82-83; Tomber, 2013, p.112; 2018, p.531.
[85] Hirt, 2011, p.179; 185; Tomber, 2013, p.112-113.
[86] Diod.3.12; Sidebotham et al, 2008, p.220-22.

soldiers stationed at Smitthus were there to guard convicted workers.[87] While several later sources do mention the use of unfree labourers in the Eastern Desert the notion of using exclusively slave labour during the imperial period has, in contrast to Hirt, rightly been questioned.[88] This is a result of recent evidence indicating that many workers were free labourers who received a substantial food ration and a monetary wage which was comparatively good for labourers in the Roman Empire.[89] Thus, while soldiers were likely not needed to guard convicted labourers, contingents such as those at Smitthus would have been required instead to provide security to workers at the mines and quarries. This was due to the value of the extracted materials and the increasing threat of attacks by the *barbaroi*.[90]

While it is clear therefore that many soldiers would have been involved in guarding Rome's mines and quarries in the Eastern Desert it is uncertain how many were assigned to this duty. It has already been observed that many sites could likely draw on soldiers from a nearby *praesidium*. On the other hand, sites such as Smitthus evidently maintained garrisons.[91] However, it is only at Mons Claudianus that the exact size of the garrison can be deduced from documents recording the provision of drinking water to the inhabitants of the quarry.[92] Since the soldiers are listed first it can be calculated that of the *c.*900 inhabitants of Mons Claudianus the garrison was comprised of 2 officers, 30 infantry, 6 cavalry and 22 recruits.[93] Perhaps due to Mons Claudianus being based around a fortified settlement, this was, therefore, a far larger garrison than those which were sent to the *praesidia*.[94] This difference has been explained by Hirt as the result of the increased responsibilities of the soldiers at Mons Claudianus.[95] This appears to have included running the medical facility and overseeing the operation of the quarry itself.[96] Indeed, Rome's imperial quarries were frequently managed by members of the

[87] Hirt, 2011, p.185. Maxfield, 2002, p.154 sees it as possible that the workers may have been slaves but sees this as unlikely. For a similar view see Sidebotham et al, 2008, p.220-221.
[88] Maxfield, 2002, p.154; Aelius.36; 67; Eusebius, *de Martyribus Palistinae*. 8.1.
[89] Maxfield, 2002, p.154; Van der Veen et al, 2018, p.360. Cuvigny, 1996, p.140-141 shows that workers could be paid half as much as members of the military.
[90] Sidebotham et al, 2008, p.216 has suggested that guarding gold mines would have been a major concern. Cobb, forthcoming, has highlighted several ostraca from Mons Claudianus that suggest that the threat of the *barbaroi* did disrupt work O. Claud. Inv. 4888; 7309; 7226; 7255; 4.851; *O. Ka. La. inv.*31; *P. Bagnall* 8.
[91] Hirt, 2011, p.185.
[92] Hirt, 2011, p.182; Sidebotham, 2011, p.89; Bülow-Jacobsen, 2018, p.17; *O. Claud.inv.*1538+2921. While this ostracon dates to the 1st century AD it is unlikely that the number of soldiers at the site declined during the 2nd century AD.
[93] Hirt, 2011, p.182; Sidebotham, 2011, p.89; Bülow-Jacobsen, 2018, p.17; *O. Claud.inv.*1538+2921.
[94] Tomber, 2013, p.112-113.
[95] Hirt, 2011, p.183. Maxfield, 2002, p.151 similarly proposes that the quarry garrisons were there to offer protection and to administer the site
[96] Hirt, 2011, p.169-171; 183; 201. For centurions at Mons Claudianus see I. Pan 21*;* 38*;* 39; 41; 42; *O. Claud.* 48. For centurions at sites across the Empire see App. no. 618; *CIL III* 12286.

military.[97] Nevertheless, despite the size and importance of Mons Claudianus' garrison Smitthus, which has yielded several inscriptions concerning soldiers, has yet to provide evidence for the size of its garrison.[98]

As a result, not only are the size of the garrisons of these other sites unknown it is also unknown how many there were. Sidebotham, Hense and Nouwens have attributed this to the limited excavation of sites such as gold mines which would have been in special need of protection.[99] Indeed, the evidence for the size of garrisons at quarries and mines across the Roman Empire offers little assistance for inferring answers to these questions. This is because the number of soldiers placed at mines and quarries seems to have varied widely with the garrison at Montana in Moesia seemingly fluctuating from between 100 and 500 men.[100] It seems, therefore, that while many of the mines and quarries of the Eastern Desert had a *praesidium* nearby and others had garrisons only Mons Claudianus provides clear evidence for its size. Despite this, Mons Claudianus' garrison of *c.*60 men, similarly to the *praesidia*, and the contingent at Montana may have fluctuated throughout the year.[101] Furthermore, while it would not have been possible for the Roman state to provide all 130 mines and quarries with this many soldiers the need to distribute troops to protect other sites may, to some degree, account for the large garrison at Mons Claudianus.[102] Thus it is possible to add at least 60 soldiers to our estimate for the number of troops deployed to the Eastern Desert and the Red Sea although it is probable that more were involved with this sector of activity.

The Red Sea Ports

Alongside establishing many of the forts (στρατόπεδα) that would later become Roman *praesidia* Ptolemy II also constructed several ports (λιμένες) to receive shipments of elephants from hunting parties that were dispatched further down the coast of the Red Sea.[103] As well as receiving elephants these ports also built the specialist vessels called *elephantagoi* that

[97] Hirt, 2011, p.177; *P. Mich*. 465; 466.
[98] Hirt, 2011, p.184-185; *AE* 1992 1820; 1821; 1823.
[99] Sidebotham et al, 2008, p.222.
[100] Hirt, 2011, p.189; 192; *CIL III* 12529; *AE* 1987: 867.
[101] Maxfield, 2002, p.157 suggests that quarry work was done throughout the year but that the intensity would have varied due to need and the number of ongoing imperial projects.
[102] Klemm and Klemm, 2013, p.616 argue that the only way that all the mines could be protected was with the support of the *praesidia* garrisons.
[103] Casson, 1993, p.247-260; Charles, 2007, p.53-65; Burstein, 1996, p.799-807; Manning, 2011; p.296-318; Cobb, 2016, p.192-204; Strab.17.1.25; 1.45; Plin.*NH*.6.33.167.
168; Strab.16.4.4–5; Pithom Stele, line 23.

transported them.[104] Although the Ptolemies are believed to have founded 12 ports along the Red Sea shore only Berenike continued to operate as receptacles of the elephant trade. This location along with Myos Hormos subsequently acted as the central hubs for both Ptolemaic and Roman trading ventures into the Indian Ocean.[105] By the end of the 1st century BC Strabo suggests that an immense volume of goods was being traded just through the port of Myos Hormos when he states that:

> I [Strabo] was with Gallus at the time he was prefect of Egypt and accompanied him as far as Syene and the frontiers of Ethiopia, and I found that about one hundred and twenty ships sail from Myos Hormos to India.[106]

Although no similar statement survives for the scale of goods passing through Berenike, the discovery of a jar in the forecourt of the so-called 'Great Temple' which contained seven kilograms of black pepper indicates that Berenike also processed a large amount of trade.[107] In addition to this, the importance of Berenike is indicated by the fact that it served as the seat of the Prefect of Berenike. This was arguably the foremost Roman official in the Eastern Desert.[108] Given the presence of this official and due to the amount of trade moving through Berenike it, therefore, seems reasonable, as Sidebotham has suggested, for the city to have had a garrison.[109] However, while a rubbish dump to the north of the city has disgorged documents that reference the delivery of water to military units within Berenike, alongside the so-called Nicanor Archive, none of these has confirmed the presence of a permeant military garrison.[110] Instead, Sidebotham observes that 10 *praesidia* were constructed to encircle Berenike in a defensive ring.[111] This he rightly suggests assumedly had the dual function of protecting the

[104] Sidbotham, 2011, p.48; *P. Petrie II* 40a; Diod.3.40.4; Agath.5.85.
[105] Sidebotham et al, 2008, p.158-176; Tomber, 2017, 537-539; Cobb, 2018a, p.29-30; Tomber, 2008, p.57-65; Sidebotham, 2011, p.1.
[106] Strab.2.5.12, translation Jones 1897.
[107] Sealand 2014: 382; De Romanis 2012: 78.
[108] On the status and duties of the Prefect of Berenike see Chapter IV.
[109] Sidebotham, 2011, p.68-69.
[110] McLaughlin, 2014, p.80; Tomber, 2008, p.24-25. See also Bagnall, Helms and Verhooght, 2000; 2005a and 2005b for collections of ostraca recovered from excavations in Berenike. For examples of deliveries of water to soldiers in Berenike see Bagnall and Ast, 2016, nos.265; 274; 257; 276; 277; 278; 279; 280.
[111] Sidebotham, 2011, p.66.

city and providing it with water.[112] Nonetheless, in addition to these outlying units, the Prefect of Berenike could probably draw on military personal based within the city itself.

These presumably came from a small personal retinue attached to the Prefect and any troops which had potentially been provided to act as an escort from an outlaying *praesidium.*[113] Moreover, these troops could well have also been supplemented by hiring any of the doubtless scores of mercenaries which it might be inferred from the Coptos Tariff and the Muziris papyrus would have gathered in the Red Sea ports to escort merchants returning to the Nile Valley.[114] Since the Prefect of Berenike appears to have commanded the *Ala Heracliana* it is not unlikely, similarly to the retinues of Rome's provincial governors, that a small number of these soldiers would always have accompanied the Prefect.[115] That this was perhaps a small number of soldiers is, as Fuhruhman highlights, because soldiers were in short supply and high demand for provincial duties during the Imperial period. Indeed, even the governor of Macedonia is noted as only having had five soldiers in his private entourage in 165 AD.[116] Nevertheless, it seems reasonable that a comparable number of troops would have been stationed in Berenike as at Mons Claudianus, at least during the peak of the trading season. Indeed, this suggestion would explain the ostraca recording deliveries of water to military units in the city.[117] Consequently, it is possible that at least 50 soldiers were present in Berenike during the trading season and more could have been summoned from the nearby *praesidia*.[118] Such a situation was, furthermore, likely the case in Myos Hormos. This would have added at least 100 soldiers to the total deployment in the region. On the other hand, the establishment of a naval force in the Red Sea, based at these ports, will have reduced the need for them to maintain an especially large or permanent garrison.

[112] Sidebotham, 2011, p.66.
[113] Cobb, 2018b, p.110; Cuvigny, 2005, 25, 77–82, 94, 154. For examples see *K*458; 315; 519a; *O. Krok*.87.
[114] Cobb, 2018b, p.111; *OGIS* 674; *P. Vindob*.*G*.40822.
[115] Sidebotham, 2011, p.260; Fuhrumman, 2011, p.190-192. *AE* 1967, 444, lines 32–37 suggest that retinues could include up to 500 men.
[116] Fuhrumman, 2011, p.184; 190-192; AE 1967, 444 lines 32–37; Plin.*Ep*.10.77; 78.
[117] Sidebotham, 2011, p.76; Ast and Bagnall, 2016, p.72; 73; 74; 75; 76; 275; 276; 277; 279; 280; 281.
[118] Sidebotham, 2011, p.66.

The Red Sea Fleet

Aside from constructing Berenike and Myos Hormos, the Ptolemies also established the precedent of having a Red Sea naval force.[119] This was likely to protect ships from attack by pirates.[120] Although little is known about these earlier naval assets their primary headquarters was probably in the port of Berenike. That this was perhaps the case is suggested by the fact that Berenike was the location where the *elephantagoi* appear to have been constructed.[121] These ships were, by necessity, very large and were technically complex to construct, thus, making them very valuable and worthy of military protection.[122] Indeed, the impact of losing just one of these ships is shown by the three-month delay required to construct a new vessel following a sinking during a return voyage to Berenike.[123] Moreover, although Strabo suggests that, during Gallus' campaign, Rome's naval forces were based further to the north at Clysma and Arsinoe, Berenike seems to have resumed its historic role as the primary naval base by the 1st century AD.[124] That this was the case is shown, firstly, by an ostracon which mentions the captain of a trireme in the city.[125] Secondly, as was noted above, Berenike's, significance as the seat of the Prefect made it the logical choice for the headquarters of Rome's Red Sea fleet. The final reason that Berenike was likely Rome's foremost naval base in the Red Sea rather than Myos Hormos is that it was 200 nautical miles further south. This made it the closest base to the mouth of the Red Sea, Leuke Kome and Rome's garrison on the Farasan Islands.[126]

The size of Rome's Red Sea fleet between the 1st and the 3rd century is unknown.[127] Although Strabo states that Aelius Gallus constructed 210 ships for his military campaign at the close of the 1st century BC only 80 of these appear to have been military vessels with the additional 130 being used to transport soldiers.[128] The situation is further complicated by the fact that the types of vessels that Rome stationed in the Red Sea are largely unknown. Nonetheless, Strabo states that Gallus' fleet was comprised of triremes, biremes and light ships and ostraca confirm that

[119] Salles, 2015, p.259; Nappo, 2017a, p.112; *OGIS* 132.
[120] See Chapter III.
[121] Gates-Foster, 2012a, p.199; Seland, 2009, p.180; *P. Petrie II* 40(a).
[122] Cobb, 2018a, p.30; Agath.5.85 a; b; Diod.3.40. Strab.2.3.4 mentions guards on the Red Sea coast. While this likely referred to troops manning the forts of the Ptolemaic period could well have included Berenike.
[123] Seland, 2009, p.181; *P. Petrie II* 40(a).
[124] Nappo, 2017a, p.115-116; Strab.16.4.23
[125] Nappo, 2009, p.60; *O.Petr*.296.
[126] Casson, 1980, p.22 suggests that Berenike had an advantage over Myos Hormos of being 200 nautical miles to the south of Berenike. On the location of Leuke Kome see *PME*.19.
[127] Cobb, 2018b, p.118.
[128] Strab.16.4.23.

a diverse range of ships including triremes and a liburna were operating in the region during the 1st century AD.[129] This makes it impossible, based on the current evidence, to determine with complete accuracy the number of soldiers assigned to Rome's Red Sea fleet. Furthermore, while the *Martyrium Arethae* states that the Emperor Justinian gathered 50 ships from the Red Sea ports in 524 or 525 AD this does not reflect the size of Rome's fleet of two hundred years earlier for several reasons.[130] Firstly, it is uncertain if these were military vessels or repurposed merchant boats.[131] Second, these ships are mentioned in connection with Justinian's support for the Axumite campaign against the King of the Himyarites.[132] Thus, like Gallus' fleet in the 1st century AD, this fleet seems to have been assembled for a specific military campaign and does not refer to the regular number of military vessels that were stationed in the area. Secondly, Justinian's invasion force is said to have numbered *c.*120,000 men.[133] That Gallus' fleet was comprised of 130 transports for only 11,500 men implies that this later account is grossly exaggerated. Nevertheless, Justinian gathers his ships from the Red Sea ports during the 6th century AD, a time when Rome's Indian Ocean trade, while still functioning, had declined from the high point of the 1st century AD.

It is certainly possible therefore that at least this many ships could well have been crewed during the imperial period. Thus, while there is no concrete evidence for the size of Rome's Red Sea fleet during the Imperial period or its composition Josephus notes that 40 ships made up Rome's Pontic fleet in the Black Sea.[134] Since the Black Sea was a key supplier of grain it does not seem unreasonable to compare the Red Sea, a region through which a large and very valuable trade returned to Roman territory to the Black Sea.[135] As a result, if Rome's Red Sea fleet included at least the same number of triremes (40) then this could have represented an additional *c.*400 soldiers stationed at the Red Sea ports.[136] Moreover, if 20 of these were based

[129] Nappo, 2009, p.61; *O. Petre*.279.
[130] Nappo, 2015a, p.75; *Martyrium Arethae*.29.
[131] De Romanis, 2020, p.68 translates *Martyrium Arethae*.29 as 'merchants came from' thus implying that the ships that were gathered were civilian not military vessels.
[132] Nappo, 2015a, p.75; *Martyrium Arethae*.29. Eide et al, 1998, p.1186 provide a discussion of a letter from Justinian which indicates that Byzantine assistance was motivated by the massacre of Christians by the Himyrite King.
[133] *Martyrium Arethae*.29.
[134] Jos.*BJ*.2.16.4
[135] Bissa, 2009, p.155.
[136] The figure of 200 men assumes that the vessels of Rome's Red Sea fleet were all triremes. Morrison et al, 2000, p.109; Jameson, 1960, p.199-200, lines 23-26. The so-called 'Degree of Themistocles' states that an Athenian trireme was to be crewed by 10 *epibatai* and 4 archers. While Saddington, 2008, p.202 notes that Roman *classis* came to use the large ships of the Hellenistic period he also observes that triremes and biremes remained in use. This variety is confirmed by the ostraca mentioned above.

at Myos Hormos and 20 at Berenike respectively then this would have provided each of the ports with a permeant if fluctuating garrison over 200 men.[137] This could, again, explain the number of deliveries of water to military units in these locations.

Leuke Kome

The author of the *Periplus* observes that, sometime between 40 and 70 AD a centurion and a detachment of troops were posted (probably by the Roman state) to Leuke Kome, a port on the Arabian coast "just to the left of Berenike."[138] However, it has been noted by De Romanis that, rather than simply being ports like Berenike and Myos Hormos, Leuke Kome was an emporium similarly to Coptos and Alexandria. This is significant because this status made it one of the locations where the *tetarte* could be collected and Indian Ocean goods could be sold.[139] This certainly indicates therefore that Leuke Kome was a strategically critical location. Then again, while the *Periplus* clearly states that there was a centurion and troops based in a fort at Leuke Kome the author does not offer any indication of how large this contingent was.[140] On the other hand, that these soldiers were entrusted with collecting taxes in Arabia before Rome annexed the region then security would certainly have been a critical concern. Nappo moreover, has also noted that Leuke Kome was a two to three-day sail away from Myos Hormos.[141]

This combination of isolation within a foreign territory and the need to efficiently collect revenue from the Indian Ocean trade certainly suggests that the contingent of soldiers would have been quite large by the standards of Rome's deployment in the Eastern Desert and the Red Sea. Due to the presence of a centurion who the *Periplus* states was in command of the soldiers at Leuke Kome, it seems reasonable to assume that the garrison of Leuke Kome was at least as large as the one stationed at Mons Claudianus. However, it is possible, although this is conjecture, that as there was a fort at Leuke Kome and given its relative isolation from easy reinforcement within a potentially hostile territory that the centurion may have commanded a full century of 80 soldiers.[142] Thus Leuke Kome appears to have represented a major overseas

[137] Nappo, 2017a, p.116 also suggests that Rome's Red Sea fleet was divided between Myos Hormos and Berenike.
[138] Casson, 1989, p.7-10; *PME*.19, translation Nappo 2010. For more on the debate about who these soldiers belonged to see Chapter IV.
[139] De Romanis, 2020, p.180; 305.
[140] *PME*.19.
[141] Nappo, 2010, p.341; Srab.16.4.23.
[142] Gilliver, 2008, p.189.

investment of Rome's military manpower at least until early in the 2nd century AD when Trajan turned Arabia into as a province.[143] However, while the military presence at Leuke Kome may have been reduced in the early 2nd century a further overseas deployment which was connected to the Indian Ocean trade appears to have quickly taken its place.

The Farasan Islands

In addition to its forces in the Eastern Desert and the Red Sea, the Roman state also dispatched soldiers to garrison the Farasan Islands, a chain located at the mouth of the Red Sea, close to the Gulf of Aden and some 1,000 kilometres to the south of Egypt's provincial border.[144] Two inscriptions indicate that Rome's troops had been stationed on the islands by the middle of the 2nd century AD.[145] Moreover, these inscriptions demonstrate that, not only was this garrison a mixture of legionaries and auxiliaries it was also involved in building work on the islands. This included several small structures and defensive towers.[146] Although these inscriptions are small and one is very fragmented the more complete of these, dating to 144 AD, clearly shows that the Prefect of the Farasan Harbour and the Herculian Sea oversaw these operations.[147] Posting such an official to the Farasan Islands is an important indicator, both of this location's significance and the size of its garrison. Indeed, by examining the ranks of officers attested in the Eastern Desert Maxfield has observed that, with one exception, the commanders of the *praesidia* garrisons do not rank above that of the centurion or decurion of an auxiliary unit.[148] Thus, it seems likely that the Farasan Prefect would have outranked these officers.

Although this is not conclusive proof, this, along with the isolated position of the islands certainly suggest that the garrison, presumably under the Prefect's command, would have needed to outnumber those assigned to the *praesidia*. Indeed, it is possible that the size of the Farasan Islands' garrison was comparable to that of Mons Claudianus where Maxfield highlights that a legionary centurion was in command. This made him the highest-ranking military officer in the Eastern Desert, aside from the Prefect of Berenike.[149] Given the remote

[143] Nappo, 2015a, p.63-64.
[144] Cobb, 2018b, p.118-119; Speidel, 2015, p.89.
[145] Speidel, 2015, p.89-90; de Proce, 2019; *AE* 2005, 1640 = *AE* 2007, 1659; 1643 = *AE* 2005, 1639 = *AE* 2007, 1659.
[146] *AE* 2005, 1640 = *AE* 2007, 1659; 1643 = *AE* 2005, 1639 = *AE* 2007, 1659.
[147] Nappo, 2017a, p.119; 1643 = *AE* 2005, 1639 = *AE* 2007, 1659
[148] Maxfield, 2003, p.163; *I. Pan 20; 39; 42; CZL* I11 75 = *ILS* 4424.
[149] Maxfield, 2003, p.163; *I. Pan 20; 39; 42; CZL* I11 75 = *ILS* 4424.

position of the Farasan Islands and its probable role in providing security it is, therefore, more than likely that the Farasan Prefect controlled at least as many troops as the Mons Claudianus commander if not more. Indeed, since the islands would have needed to be supplied by ship it is also very likely that the Farasan Prefect might have had control of part of the Red Sea fleet. This would have further supplemented his available manpower. Thus, if the Farasan Prefect also had access to perhaps five of Rome's 40 triremes in the Red Sea then it is a reasonable conjecture that the Farasan garrison could have numbered somewhere above 110 men.

Soldiers Outside of the Eastern Desert

It has been argued throughout that scholars are right to suggest that as many as 1,000 men were stationed within the Eastern Desert and the Red Sea during the 2nd century AD. However, it appears that additional units were garrisoned just outside of the region. These included more than 500 men based at Contropollonis and a further 500 cavalry stationed at Coptos.[150] In addition to this, Speidel notes that by 216 AD a unit of Palmyrene archers was also relocated to the Eastern Desert and based out of Coptos, although, the size of this force is unknown. These archers, Speidel suggests, were seconded to the region either due to their experience operating in Palmyra's desert or to further the interests of their merchants' active in the Indian Ocean trade.[151] While either suggestion is plausible the first indicates that many of this unit's members were probably detached for duties across the desert. Indeed, the practice of dividing a unit is well-attested from records of troops stationed along Hadrian's wall.[152] Consequently, it is unlikely that the entire unit of archers or, indeed, the cavalry would have been present at any one time. Similarly, this situation is potentially true of the Contropollonis garrison. Indeed, these units likely provided many of the troops that manned the *praesidia* and other locations.

Nevertheless, the presence of additional, sometimes very large units, makes it plausible that, while *c.*1,000 men were routinely deployed in the Eastern Desert and the Red Sea proper, perhaps as many again were deployed at key locations like Coptos and Contropollonis. These were both crucial access points into the region. Thus, although this suggestion is certainly hypothetical it is very possible that, far from being limited as the opening quote from Adams

[150] Sidebotham, 2011, p.260; Fink 1971 cited in Sidebotham, 2011, p.260.
[151] Speidel, 1984, p.221. Cobb, 2020, p.69-70 has argued that the evidence for Palmyrene merchants involved in the Red Sea branch of the Indian Ocean trade largely comes from the mid-2nd to 3rd century AD.
[152] *Tab Vindol II* 154.

suggests, Rome could have sent as many as 1,500 or 2,000 soldiers to the Eastern Desert, the Red Sea and the surrounding area. If this was the case, then this force would have represented as much as 10% of Rome's military power in Egypt in the early 1st century AD and 20% by the early 2nd century AD.[153] For so many additional troops to have potentially been posted outside of the Eastern Desert would have not only been logistically necessary but was also advantageous for several reasons. This arrangement would have firstly accounted for the need to ensure supplies of food and due to the difficulties of obtaining sufficient water.[154] However, having so many additional soldiers positioned at the entrances to the desert would have also prevented the smuggling of valuable materials such as wood which appears to have been a matter of genuine concern.[155] On the other hand, it would have also allowed for the easy rotation of the desert garrisons.[156] Finally, having additional forces nearby would have allowed for the undertaking of small-scale offensive actions against the *barbaroi*.[157]

Conclusion

This chapter has shown that, far from being limited, the Roman military presence in the Eastern Desert and the Red Sea represented a significant investment by the state. Indeed, this deployment of perhaps as many as 2,000 men represented about 10% of Rome's armed forces in Egypt in the early 1st century AD and 20% by the early 2nd century AD. Moreover, this chapter, by adopting a flexible approach to the evidence has attempted not only to broadly confirm previous estimates but also to offer original figures for the size of Rome's *praesidia* garrisons, Mons Claudianus, the Red Sea fleet, the Leuke Kome fort and the Farasan contingent. While these latter discussions are, by necessity, highly speculative they are based on a plausible reading of the surviving evidence. These military assets, as has been hinted at throughout this chapter, gave the Roman state the means to implement measures intended to guarantee the acquisition of the *tetarte*. Moreover, it was observed that the increases in the number of troops that would have proactively protected revenue were deployed apparently in reaction to changes in circumstance such as an increasing hostility and fortification in the Eastern Desert.

[153] On the number of Roman soldiers deployed in Egypt between the 1st and 3rd centuries AD see Appendix III.
[154] For both issues see Chapter III.
[155] *O. Did* 416.
[156] Symonds, 2017, p.24-25; Broux, 2017, p.145; *P. Mich. III* show that the Eastern Desert garrisons could be deployed for up to five months at a time.
[157] For a full discussion see Chapter III.

II.

Security in the Eastern Desert and the Red Sea

> The remaining areas to the south are inhabited by the Trogodytes, Blemmyes, Noubai, Megabaroi and the Ethiopians above Syene. These peoples are nomads, lack numbers and are not warlike, but they were considered to be so by men of former times because often as brigands they attacked those without protection.[158]

The primary function of Rome's military forces in the Eastern Desert and the Red Sea is often thought, in contrast to the view of Strabo expressed in the opening quote, to have been the protection of merchant caravans travelling between the Red Sea and the Nile Valley from attack.[159] That the danger was very real is made clear by Pliny the Elder shortly after Rome's occupation of the Mediterranean end of the Indian Ocean trading network.[160] This threat is also confirmed by military documents recovered from the *praesidia* which refer to the attackers as the *barbaroi*.[161] On the other hand, despite acknowledging the risks which the *barbaroi* presented Young has instead argued that the state military's primary duty was not to protect merchants but rather to monitor their activities.[162] This, Young suggests, was to ensure that the state received the correct amount of tax revenue from the Indian Ocean trade.[163] On the face of it, given that this income was the foremost reason for the state's involvement Young's view is very reasonable. However, in response to Young, Cobb has argued that while supervising merchants was certainly an important function of the military their contributions to security in the region cannot be underestimated.[164] Indeed, Cobb advises that this function became increasingly important early in the 2nd century AD.[165] Given these contrasting views, it is,

[158] Strab.17.1.53, translation Cobb 2019.
[159] Sidebotham, 2011, p.3; Adams, 2007, p.197; Maxfield, 2003, p.154; Young, 2001, p.69-71.
[160] Plin.*NH*.6.162.
[161] *O. Krok*.87; *O. Dios. Inv*.687.
[162] Young, 2001, p.70; 72. Maxfield, 2000, p.425 takes a similar view.
[163] Young, 2001, p.72-73.
[164] Cobb, 2018b, p.111.
[165] Cobb, 2018b, p.108-110; 2019, p.98-103.

therefore, necessary to determine the extent to which the Roman military proactively provided security in the Eastern Desert.

In addition to these dangers, piracy is increasingly being recognised as another major threat to the merchants that traversed the Red Sea.[166] Indeed, fragments of Strabo and Diodorus, who appear to be using material by Artemidorus and Agatharchides, suggest that piracy had been a significant problem in the region since the time of the Ptolemies.[167] However, similarly to Young, despite recognising testimonies on the dangers of piracy in the Red Sea during the Roman period Schneider has cautioned that there is not enough evidence to determine the extent of the threat.[168] On the other hand, Speidel, McLaughlin and Nappo have argued that the military went to great lengths to control piracy in the Red Sea. This included stationing troops on the Farasan Islands and patrolling the Red Sea itself.[169] Consequently, considering these somewhat opposing views it is also important to examine the extent to which Rome's Red Sea fleet provided security in the Red Sea. Finally, through considering the increased state provision of security in the Eastern Desert and the Red Sea it may be possible to emphasize that this was potentially a reactive measure that was driven by the desire to proactively collect the *tetarte*.

The *barbaroi* of the Eastern Desert

The reason for the deployment of Roman soldiers in the Eastern Desert is usually connected with references to the *barbaroi* a nomadic population that inhabited the area and posed a danger to members of the intrusive populace.[170] Like the threat of piracy in the Red Sea fear of attacks by the *barbaroi* seem to have been a concern since the Ptolemaic period.[171] This was likely a significant reason for the presence of Lagid troops which Strabo says guarded the Red Sea.[172] On the other hand, despite frequent appearances in Ptolemaic and Roman written material very little physical or literary culture has survived from the *barbaroi* themselves.[173] Indeed, while

[166] Nappo, 2015a, p.57-62; 2017, p.112-116 and Cobb, 2018b, p.117-120; McLaughlin, 2010, p.80-81; Speidel, 2015, p.96.
[167] Schneider, 2014, p.7; Strab.16.4.18; Diod.2.55.2-3; 3.43.5. On piracy in the Red Sea see Nappo, 2015a, p.57-62; 2017, p.112-116 and Cobb, 2018b, p.117-120; McLaughlin, 2010, p.80-81; Speidel, 2015, p.96.
[168] Schneider, 2014, p.9-10; Plin.*NH*.6.162; *PME*.4; 20.
[169] Speidel, 2015, p.96; McLaughlin, 2010, p.80; Nappo, 2017a, p.116.
[170] Plin.*NH*.6.33.167-168; *PME*.2; Strab.16.4.4-5.
[171] *I. Kanais*.3; 8; 13; 18; 43; 47; 62; 82; 90.
[172] Strab.2.3.4-5.
[173] Cobb, 2019, p.93; Cuvigny, 2014, p.166.

caches of so-called Eastern Desert Ware have been discovered and at least one document referring to a 'King of the Blemmyes' has been found these appear to date from the Late Antique period.[174] As a result, much of what is known about the *barbaroi* is derived from literary sources and ostraca written in Greek and Latin many of which are highly generalist and often derogatory.[175] Nevertheless, these sources do suggest that the *barbaroi*, rather than being a single collective, were made up of many distinct groups some of which were identified by their culinary habits. This included the Fish-eaters and the Wild-animal eaters.[176]

However, other groups, such as the Troglodytes, appear to have inhabited entire sections of the Eastern Desert.[177] This has led some, such as Lasanyi, to propose that one such group, the Beja, had a distinct culture spanning from the 1st to the 3rd century AD. However, Cuvigny has correctly observed that the situations of different groups prevented the development of any such unified culture.[178] Indeed, that Pliny the Elder lists the names of several additional groups confirms the view that there was likely no single culture amongst the Eastern Desert's nomadic inhabitants.[179] Perhaps in part due to this apparent lack of cultural unity warfare seems to have been a common feature of these societies with literary descriptions of them using small shields and clubs.[180] This certainly indicates that the *barbaroi* were capable of threatening the intrusive populations of the Eastern Desert. This would certainly, therefore, justify the deployment of Rome's military forces.

However, some groups of *barbaroi* appear to have co-operated with the Eastern Desert's Roman and before them the Ptolemaic inhabitants. This included marrying individuals, requesting permission to relocate a fishing boat and delivering fish to the workers of a quarry.[181] These individuals (or groups), as the ostraca show, rather than being referred to as a *barbaros* are, at least in two instances, referred to as 'Arabes' or people living to the east of the Nile Valley.[182] Moreover, as is indicated by the two ostraca mentioning an Arabes coming to sell

[174] Barnard, 2005, p.38; Ast, 2019.
[175] Cobb, 2019, p.93; Strab.17.1.53–54; Plin.*NH*.5.46. Eide et al, 1989, p.760 notes that there are other sources written in Demotic and Coptic these are collected in volume three of the Fontes Historiae Nuhiorurn.
[176] *PME*.2.
[177] Cobb, 2018b, p.94; Cuvigny, 2014, p.198; Plin.*NH*.6.33.167-168.
[178] Cuvigny, 2014, p.178-179. Bernard, 2005, p.38; 2009, p.21 agrees with this view.
[179] Plin.*NH*.6.33.167-168.
[180] Strab.16.4.17.
[181] Gates-Foster, 2012a, p.202; Cobb, 2018b, p.96; Brun, 2006b, p.196; Cuvigny, 2006b, p.267-273; *Hauswaldt*.6; 15; *O*.512; *O. Claud. Inv*.529; 830.
[182] Cuvigny, 2014, p.170-171; *O. Claud. Inv*.529; 830.

fish it is clear that these groups would trade with the *praesidia*.[183] However, this example also indicates the potentially complex and dual nature of the relationship between Rome and the nomadic groups of the Eastern Desert. This is because a further document shows that the *barbaroi* were aware of the prices which goods that were stolen from trade caravans could fetch.[184] This suggests that one day's trading Arabes could be the next day's hostile *barbaros*.[185] Indeed, since the term *barbaroi* is used exclusively by military reports this suggests that the term was used by the military to refer collectively to hostiles regardless of their group of origin.[186] While nomadic groups could therefore clearly be co-operative this does not preclude them from undertaking aggressive actions although it must, still, be cautioned that not all appear to have done so. Nonetheless, where these *barbaroi* did become aggressive they did, at times, represent a life-threatening risk. This is made apparent by an account of a particularly well-known raid on the *praesidium* of Patkoua:

> I want you to know that, on 13 March, sixty barbaroi attacked the praesidium of Patkoua. I fought them with my comrades from the tenth hour (of the day) until the second hour of the night. Then they sat down near the praesidium until dawn. On that day, Hermogenes, a foot soldier, of the century of Serenus, was killed, one woman and two children were carried off, one child was killed. On 14 March at dawn, we fought them. Damanaios, horseman, of the century of Victor, [was killed?], Valerius Firm-- was struck, and his horse as well.[187]

Despite this major attack, Cuvigny proposes that the threat to the *praesidium* was minimal since this large group was unable to take the lightly held fortification.[188] Similarly, Maxfield has argued that, as the modern Bedouin population, the number of *barbaroi* during the Roman

[183] It is unclear who the 'Arabes' were. One suggestion by Power, 2007, p.331; 335 it that the Arabes had continuously been in the region of Eastern Egypt and were a precursor to the Saracens of the Late Antique period.
[184] O.Xer.inv.465.
[185] Cuvigny, 2014, p.174-175 proposes a similar view based off *O. Krok*.49 although this ostracon is difficult to translate entirely due to its fragmentary nature.
[186] Cobb, 2018b, p.94; Cuvigny, 2014, p.198.
[187] *O. Krok*.87, translation Cuvigny 2014.
[188] Cuvigny, 2014, p.184.

period was small.[189] This would, presumably, have made such attacks rare occurrences. However, for this attack to result in the abduction of at least one woman, a child, and the deaths of two cavalrymen and one infantryman suggests that this attack was a genuine existential threat to this *praesidium*. Indeed, to have lost two men from a garrison which Cuvigny proposes was 15 men strong represents a high percentage of casualties. Furthermore, that other ostraca record attacks in which casualties were taken indicate that the raid on Patkoua was probably not unique.[190] Additionally, letters such as that received by Melanas cautioning against leaving the protection of the *praesidium* for fear of attack suggests that this was the case.[191] Thus, although Young suggests that security was not the primary concern of the military and Cuvigny sees the threat of the *barbaroi* as limited it is the case that they represented a significant threat. This needed to be met with armed force. Much of this hostility was likely due to a combination of factors. This included encroachments on territory and the expansion of the Indian Ocean trade which increased the number of valuable caravans on the desert roads. However, other less obvious factors such as a takeover of emerald mines between 26/25 BC and 11 AD have also been proposed.[192]

The Pirates of the Red Sea

Similarly to the *barbaroi*, pirates appear to have been enough of a concern for Rome to deploy military assets in the Red Sea.[193] This also appears to have been a concern for the Ptolemaic Pharaohs who were compelled to deploy several quadriremes to combat the problem.[194] Moreover, that this continued to be a significant problem in the Roman period is suggested by the *Periplus* when the author warns that shipwrecks off the Arabian coast would be plundered and anchored ships would be subjected to raids.[195] Despite acknowledging this threat to commercial activity Schneider cautions that the surviving evidence does not provide any numerical data with which to effectively determine the impact of piracy.[196] Certainly, while accounts of piratical activity do not supply any specific numerical information Pliny the Elder

[189] Maxfield, 2002, p.143. Maxfield, 2000, p.409 argues that the population was small but not insignificant.
[190] *O. Krok*.6; 47.
[191] *O. Dios* inv.687; *O. Claud*.4.851.
[192] Cuvigny, 2014, p.184; Cobb, 2019, p.100-103; Strab.11.1.5.
[193] Simmons, 2019; *PME*.20; 53.
[194] Diod.3.43.4-5; Strab.16.4.18.
[195] *PME*.20.
[196] Schneider, 2014, p. 9-10.

implies that there were enough pirates for them to have utilised small rafts.[197] Similarly, where authors such as Lucian and Jerome do not offer any precise information on the number of pirates involved, they do suggest that there were frequently dangers involved in crossing the Red Sea.[198] This implies that encountering pirates was a regular occurrence. On the other hand, Diodorus, who uses information from an earlier Ptolemaic era source, provides comments from which to infer the potential extent of the problem:

> In ancient times these men [the Nabateans] observed justice and were content with the food which they received from their flocks, but later, after the Kings in Alexandria had made the ways of the sea navigable for their merchants, these Arabs not only attacked the shipwrecked, but, fitting out pirate ships, preyed upon the voyagers... some time afterward, however, they were caught on the high seas by some quadriremes and punished as they deserved.[199]

While Diodorus' account does not provide any figures for the number of pirates he does make it clear that the Ptolemaic response included the deployment of quadriremes. These were military vessels which had their origins in the 4th century BC when warships began to dramatically increase in size.[200] As a result, large military vessels became a defining feature of the navies of Hellenistic states including the Ptolemies.[201] In addition to the increase in the size of ships, their crews also became larger. Thus, while earlier triremes are thought to have carried *c.*200 crew later ships, such as the quinquereme, is believed to have carried *c.*364 crew members.[202] More importantly, these larger crews included greater compliments of armed marines. This meant that while a trireme is thought to have carried *c.*10 marines a quinquereme is believed to have carried *c.*40.[203] Using the reconstructed crew roster of a Rhodian quadrireme Pitassi has suggested that it carried a mixed force of 30 archers and marines.[204] Moreover,

[197] Plin.*NH*.6.176.
[198] Lucian. *Alexander the False Prophet*.44; Jerome. *Ep*.135.
[199] Diod.3.43.4-5, translation Lauren 2014.
[200] Murray, 2012, p.23-30.
[201] Fischer-Bovet, 2014, p.72.
[202] Pitassi, 2011, p.100.
[203] Pitassi, 2011, p.100.
[204] Pitassi, 2011, p.113. Pitassi states that his figure is derived from several inscriptions which he does not cite. See Pitassi, 2011, p.105 for a summary of the roster.

Pitassi has proposed that the quadrireme, weighing *c.*60 tons, was faster and more manoeuvrable than the quinquereme.[205] Indeed, this mobility and speed are shown by Hannibal the Rhodian's infamous running of the Roman blockade of Lilybaeum during the First Punic War.[206] For the Ptolemies to choose to deploy these fast, mobile and heavily armed ships to the Red Sea indicates that piracy was enough of a problem to require a large and specialised response. Indeed, this second point is supported firstly by the case of Hannibal the Rhodian and secondly by De Romanis emphasis that lower tonnage ships would have been needed to easily navigate the northern reaches of the Red Sea.[207] That quadriremes were lighter and more manoeuvrable than other Ptolemaic vessels confirms that the choice of ship was seemingly tailored for the challenges of the Red Sea.

However, while it is true that Diodorus does not specify how many quadriremes were deployed his account clearly states that it was more than one. As a result, piracy in the Red Sea was apparently serious enough to have required multiple ships each carrying 30 soldiers. While this deployment likely represented only a tiny portion of the Ptolemaic fleet it is, nonetheless, strongly indicative of a notable threat.[208] Thus, while it must be cautioned that the scale of Red Sea piracy under the Ptolemies should not be directly correlated to the Roman period given the later need for a permanent fleet it likely remained a major concern. Indeed, Schneider himself rightly recognises that piracy would have probably increased as Rome's trade in the Indian Ocean expanded.[209] Consequently, similarly to the *barbaroi*, security would have been needed to prevent piracy.

Security in the Eastern Desert

Despite acknowledging the threat that the *barbaroi* posed Young, whose monograph was published in 2001 and before the full publication of the results of the IFAO's work in 2003 and 2005, proposes that the main role of soldiers in the Eastern Desert, rather than protecting merchants from attack, was instead monitoring their movements.[210] This assertion is based on two strands of evidence. Young's first point is that the evidence shows that security was

[205] Pitassi, 2011, p.105.
[206] Steinby, 2014, p.89-90; 1.46.4-1.47.10.
[207] De Romanis, 2020, p.45-56. It should be noted that De Romanis is discussing merchant vessels in the Roman period by the same factors would likely have applied in the time of the Ptolemies.
[208] Fischer-Bovet, 2014, p.72.
[209] Schneider, 2014, p.11.
[210] Young, 2001, p.70; Sidebotham, 2011, p.164-165.

provided by private guards rather than Rome's military. Young's second point, in contrast, is that, by examining the placement of the *praesidia*, it appears that they were positioned for observation rather than defence.[211] That guards, which were hired privately, were frequently used by merchants to escort their caravans is well-attested by both the Coptos Tariff and the Muziris papyrus. These documents date to the end of the 1st and the middle of the 2nd century AD respectively.[212] The Coptos Tariff lists a 'guard' as being charged at a rate of five *drachmae* to travel along the roads connecting Coptos to the Red Sea ports.[213] That these guards regularly escorted merchant convoys, moreover, is hinted at in the Muziris papyrus when the borrower of the loan informs his lender that the Hermapollon's cargo will be accompanied under guard to Coptos.[214]

Young is, therefore, undeniably correct to posit that privately hired guards were critical to Indian Ocean traders for protecting them from attack. Furthermore, although it is impossible to determine the number of guards that were involved in transporting the Hermapollon's cargo, that the state charged a fixed rate for a guard to enter the Eastern Desert suggests that hiring private security was an especially common practice.[215] Moreover, the Muziris papyrus may represent the terms of a standard loan contract for participants in the Indian Ocean trade, suggesting that it was commonplace for investors to stipulate requirements relating to the provision of private security (to ensure the safety of their investment).[216] Thus, it appears that the evidence strongly supports Young's view that soldiers were not needed to provide security. Instead, it seems that this role was fulfilled by private contractors. Indeed, where the evidence shows that military escorts were provided, these appear to have been only two or three cavalrymen and required approval from the Prefect of Berenike.[217] This, Cobb has rightly argued, would have made using private guards a necessity.[218]

On the other hand, while private guards were doubtless a crucial means of providing security in the Eastern Desert Cobb rightly cautions that the contribution of state forces must not be underestimated.[219] This becomes starkly apparent considering the location and, as has been

[211] Young, 2001, p.69; 70; 72; *P. Vindob.G.*40822, *Recto, column* ii, lines 2-3; *OGIS* 674, line 6.
[212] *P. Vindob.G.*40822, *Recto, column* ii, lines 2-3; *OGIS* 674, line 6.
[213] Young, 2001, p.72; *OGIS* 674, line 6.
[214] *P. Vindob.G.*40822, *Recto, column* ii, lines 2-3.
[215] McLaughlin, 2010, p.30.
[216] Rathbone, 2000, p.41.
[217] Cobb, 2018b, p.110-111; Cuvigny, 2005, p.25, 77–82, 94, 154. See for example *K*458; 523; 315; 519a; *O. Krok*.87.
[218] Cobb, 2018b, p.110.
[219] Cobb, 2018b, p.111.

noted, the size of some of these attacks. These attacks are certainly apparent from the start of the 2nd century AD with ostraca dating between AD 102/103 and 118 recording several assaults on the *praesidium* of Krokodilo.[220] Although no comparable ostraca reporting such attacks survive from the 1st century AD, there are inscriptions which allude to the reconstruction of fortifications at several of the other *praesidia*. Both the inscriptions and ostraca suggest that not only did the number of attacks increased during the 2nd century AD, but the *praesidia* and their occupants were at risk of being directly targeted.[221] Inscriptional and archaeological evidence indicates that a major phase of (re)fortification took place in the Flavian period and into the second century AD.[222] Cuvigny, among others, has suggested that this increased fortification may be in contrast to an earlier more peaceful Julio-Claudian period. One of the pieces of evidence cited in support of this is an inscription set (two of six slabs survive) which records the construction of cisterns at Apollonos Hydreuma, Compasi and Berenike, and a camp (*castrum*) at Myos Hormos.[223] However, the dating of *ILS* 2483 to the early Julio-Claudian period is not a definitive and some have noted the possibility that it could be linked to Flavian era construction activity.[224] Either way, there is little reason to doubt the suggestion made by Cuvigny, Cobb and others that the late 1st and into the early 2nd century AD witnessed a notable increase in hostilities.

Moreover, some of these attacks appear to have been directed at the occupants of the *praesidia*. Consequently, in opposition to Young, it is impossible not to closely associate the presence of soldiers with providing security in the Eastern Desert. However, since the Muziris papyrus suggests that private guards escorted merchants and their goods Rome's soldiers presumably concentrated on defending the *praesidia* and their immediate area.[225] Indeed, the large attack recorded in *O. Krok* 87 and quoted above suggests that this is very likely. It is possible that such a large attack on a *praesidium* was attempting both to obtain valuable plunder and, perhaps, to access the sources of water on which these fortifications were regularly situated.[226] Certainly, the potential for caravans to rest and resupply at the *praesidia* would have made these locations tempting targets.[227]

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[220] Cobb, 2018b, p.299; Brun, 2006b, p.61–71; Cuvigny 2005, p.36; *K*534.
[221] Cobb, 2015a, p.377-379; 2018a, p.299-301; 2019, p.98-100; *ILS* 2483; *I. Pan*.68; *I. Did*.1; *I. Did*.2; *O. Krok*.87.
[222] *I. Pan*.68; *I. Did*.1; *I. Did*.2.
[223] Cuvigny 2001, 330; Cuvigny, 2011, 5; *ILS* 2483.
[224] Cobb, 2019, p.99; Sidebotham, 2011, p.154.
[225] Sidebotham, 2011, p.164-165
[226] See chapter III for a full discussion of water in the Eastern Desert.
[227] Young, 2001, p.69.

Similarly, to his first point, Young is certainly correct to observe that, since the *praesidia* were placed directly on the road this made them ideal for observation rather than defence.[228] Thus, it is possible that this was the primary duty of troops in the region.[229] Indeed, it is very likely that monitoring the roads was an important aspect of soldiers' duties. This is suggested by the large number of *skopoloi* that were constructed.[230] On the other hand, it is, nevertheless, important to highlight several features of the *praesidia* which appear to have been closely associated with defence rather than observation. The first of these is highlighted by Cobb who proposes that placing the *praesidia* on level ground also enabled easier access for both people and trade caravans.[231] While, in Young's view, this compromised security the significance of this accessibility must not be overlooked, especially, considering the presence of civilians in the *praesidia*. As has already been seen these included women and children. Moreover, the account of the raid quoted above which references the abduction of a woman and two children strongly suggests that having easy access to the defences of a *praesidium*, the walls of which could be up to five-meters high was of paramount importance.[232]

Thus, placing the *praesidia* on higher, more defensible positions seems to have been outweighed by the necessity of accessing these fortified areas rapidly. Secondly, it must be noted that when considering where to place the *praesidia*, the Roman state must have noted the locations of natural water sources.[233] This water, which was normally accessed via large and sophisticated wells was usually located on the valley floor rather than on higher ground.[234] These sources of water were of fundamental importance.[235] This indicates, furthermore, that the *praesidia*, as well as being positioned to monitor the roads of the Eastern Desert, also accounted for being able to protect civilians and secure supplies of water. Although observation was therefore clearly important it is equally clear that the observations which Young makes regarding the *praesidia* were designed to enhance the protective potential of these locations and their garrisons.

Subsequently, while Young makes a series of valid point concerning the nature of security in the Eastern Desert and the role of Rome's soldiers Cobb has rightly posited that this should not

[228] Young, 2001, p.69-70; Sidebotham, 2011, p.164-165 also makes a similar observation.
[229] Young, 2001, p.69-70.
[230] Zitterkopf and Sidebotham, 1989, p.155; 186-187; Young, 2001, p.70-71. For more on observation see below.
[231] Cobb, 2018b, p.111.
[232] Sidebotham et al, 2008, p.55.
[233] See Chapter III.
[234] Sidebotham, 2003, p.89; 2011, p.97-101.
[235] On this see Chapter III.

detract from their contribution to security in the region. Indeed, while private guards seem to have escorted merchants the relatively small size of the *praesidia* garrisons and the increase in attacks likely limited most army activity to defending these areas.[236] Nevertheless, as military reports indicate, Rome's troops were proactively engaged in defending these locations. Moreover, in the limited cases were military escorts were authorised these mounted soldiers could very easily have been used to summon reinforcements or disperse small groups of *barbaroi* during an attack.[237] As a result of these arrangements, it is reasonable to suggest that Roman soldiers which were deployed in larger numbers, doubtless, in reaction to increasing attacks in the 2nd century provided a proactive layer of security that offered vital stability to participants in the Indian Ocean trade. Consequently, these efforts ensured that the *tetarte* was collected.

Security in the Red Sea

Although it has been established that Rome continuously maintained a fleet of warships in the Red Sea to hunt pirates Simmons also assumes that it protected merchants.[238] However, no source states explicitly what, if anything, the fleet did to achieve this. On the other hand, the *Periplus* clearly states that pirates were known to frequent certain locations across the Red Sea:

> while the area inland has villages and pasturages inhabited by people, speaking two languages, who are vicious: they plunder any who stray from a course down the middle and fall among them, and they enslave any who are rescued by them from shipwreck.[239]

Although this passage does not explicitly mention a response by any military vessels it is possible that if the author of the *Periplus*, who is believed to have been an active merchant,

[236] This view is broadly in line with that of Sidebotham, 2011, p.164-165.
[237] McLaughlin, 2010, p.30 suggests that private guards were frequently used and Cobb, 2018b, p.111 suggests that Roman soldiers who accompanied merchants were likely authorised to summon reinforcements from nearby *praesidia*; Cuvigny, 2005, p. 25, 77–82, 94, 154. See for examples of small military escorts for merchants *K*458; 523; 315, 519a; *O. Krok*.87.
[238] Simmons, 2019.
[239] *PME*.20, translation Casson 1989.

knew where pirates operated then it is highly likely that the captains of Rome's fleet possessed similar knowledge.[240] As a result, it is possible that some of Rome's triremes could have been dispatched to patrol areas such as these, particularly around the time that merchants returned from India. Given the proposed size of Rome's Red Sea fleet, that it would have needed to focus its patrols on known hot spots rather than escorting individual ships becomes obvious. This is abundantly clear for two reasons. Firstly, if the Red Sea fleet did indeed number only 40 vessels then when compared to the 120 ships which Strabo states traded with India at the close of the 1st century BC it would have been impossible for the fleet to have escorted each ship.[241] The second reason was likely due to the practical constraints involved in navigating the Red Sea with triremes. While it has been convincingly argued that, despite the prevailing northerly winds, square-rigged Roman trading vessels were capable of navigating up to the northern end of the Red Sea within two and a half days this was travelling at six-point-two knots and in ideal conditions.[242] On the other hand, triremes, which primarily used oared propulsion seem to have been able to achieve speeds of seven to eight knots when pressed.[243] Indeed, one infamous example of the peak speeds achieved by a trireme is demonstrated in Thucydides account of the Athenian ship dispatched to Mytilene in 427 BC.[244] In this instance, the crew was able to travel 184 nautical miles within 24 hours. Although such speeds were possible it is more likely that the regular speed of a trireme under oar would have been nearer the speed of a sailing vessel in ideal conditions. Thus, while the Red Sea fleet would have been fast, and mobile considering that it would have had to protect a region of *c.*438,000 square kilometres limiting its geographical focus would have maximised its effectiveness and its ability to provide security.

Alongside these state efforts, Pliny the Elder asserts that groups of archers travelled aboard merchant vessels.[245] Both Whittaker and Gurukkal have proposed that these were soldiers seconded from the military. However, the proclivity of privately hired guards makes it likely that these were sourced by similar means.[246] Indeed, if Whittaker and Gurkkal were correct and each of Strabo's 120 ships were supplied with at least 10 men then this would have represented

[240] Casson, 1989, p.7-10; See Sidebotham, 2011, p.156-161 for a summary of the maps and guides concerning the Eastern Desert and the Red Sea. Moreover, Sideobtham, 2011, p.158 notes that of the guides and maps which appeared in the Roman period some were created by state sanction and some by private initiative.
[241] Strab.2.5.12.
[242] Facey, 2007, p.9-11; Whitewright, 2007, p.85.
[243] Morrison et al, 2000, p.106.
[244] Thuc.3.49.
[245] Plin.*NH*.6.26.101.
[246] Whittaker, 2004, p.167; Gurukkal, 2016, p.65; *P. Vindob.G*.40822, *Recto, column* ii, lines 2-3; *OGIS* 674, line 6.

over half of Rome's forces in the region. Regardless, this, in conjunction with the Red Sea fleet, would have further deterred pirates in the Red Sea but would also have protected against pirates operating off the Indian coast, well beyond the reach of state support.[247] As well as using the Red Sea fleet to provide security by regularly patrolling certain areas these ships also connected the troops stationed on the Farasan Islands (and presumably Leuke Kome) and delivered their supplies.[248] However, it has already been suggested that these forces on the Farasan Islands were involved in maritime security. This is certainly possible since the islands were located close to the coast of Arabia and to Aden, both of which were known areas of piracy.[249]

Furthermore, it has already been observed that the islands were the base of the Prefect of the Farasan Harbour and, thus, it is possible that part of the Red Sea fleet was permanently posted to the area. All this evidence seems to confirm that the Farasan Islands were an ideal location for conducting localised interventions and improving security in the Red Sea. Furthermore, the position of the islands, close to the mouth of the Red Sea would have allowed Rome's troops to supervise incoming merchants and so proactively take steps to ensure that the *tetarte* was collected. Indeed, the distance between the Farasan garrison and Roman territory demonstrates the state's commitment to this task. Although the evidence is less concrete it certainly appears that Rome's Red Sea fleet did much to provide security in the region. Moreover, these seem to have been actions that were a reaction to the problem of piracy that were intended to proactively secure future tax revenue. This potentially included maximising its limited naval assets in areas known to have been targeted by pirates. These efforts were assisted by using private security on merchant vessels. This subsequently negated the need for the Red Sea fleet to escort individual ships. Finally, the members of the Farasan garrison plausibly extended this sphere of security far beyond Roman shores up to the mouth of the Red Sea. However, this force would have also ensured that the state had control of a key location for merchants returning from the potentially very hostile environment of the open ocean.[250]

[247] Plin.*NH*.6.26.101.
[248] See chapter I for details of the Farasan garrison.
[249] *PME*.20.
[250] Beresford, 2013, p.221-222; 230; 234 outlines the numerous dangers faced by merchants sailing on the open sea in the Indian Ocean.

Campaigns Against the *barbaroi*

While Rome's military defended the *praesidia* in the Eastern Desert and provided security in the Red Sea Cuvigny has proposed that they also undertook at least one campaign against the *barbaroi*. This, she hypothesises, was a retaliatory attack led by the Prefect of Berenike, Severus Sulpicius Servenus, in 122/123 AD.[251] The brief, two-day campaign, is commemorated by a stele set up in the event's aftermath and dedicated to Jupiter. In his account Severenus records that he chased a group known as the Agriophagoi over multiple days. Moreover, he states that he fought and killed most of the group and recovered their plunder and some camels. Furthermore, he proclaims that he lost no soldiers during the action. On the other hand, Cobb has rightly noted that there is no reason to exclude this incident from being a planned and unprovoked attack on the Agriophagoi.[252] Conversely, while both Cuvigny and Cobb could be correct there is a third possible interpretation. In his stele, Severenus explicitly states that the Agriophagoi were chased. Consequently, although it is not stated where this pursuit began this action could have been, a retaliatory action immediately following an attack. However, because the Prefect of Berenike (Servenus) personally led the attack it appears that he was commanding an expedition which was organised to hunt down this group.

While Servenus' stele does not confirm this or the nature of the campaign one way or the other the third possible interpretation stems from the fact that actively seeking out robbers was a concern for the Egyptian Prefect. As Fuhrumann has argued, keeping his domain in order was one of the principal duties of a provincial governor.[253] Thus, it seems likely that, for the Eastern Desert and the Red Sea, this duty would have been passed on to the Prefect of Berenike. This could therefore have motivated Severenus to claim credit for chasing down the Agriophagoi and set up his stele even though he may not have personally participated in the action. Indeed, given that the Egyptian Prefect would have visited the Eastern Desert and the Red Sea such a monument would have served a very practical purpose for the Prefect of Berenike to advertise the successful completion of his duties although this third interpretation is speculation. Regardless, it is clear from this example that soldiers did conduct small-scale campaigns against groups of *barbaroi*.

[251] Cuvigny, 2006a, p.348-349; 2014, p.177-178; *I. Pan* 8; *I. Memnon*.20; *O. Dios. Inv*.90.
[252] Cobb, 2018b, p.110.
[253] Fuhrumann, 2011, p.200; *P. Oxy*.12.1409.

Smuggling and Supervision

While it has been shown throughout this chapter that state soldiers were crucial for providing security in the Eastern Desert and the Red Sea it is still vital to recognise, as Young argues, their attempts to supervise merchants and prevent smuggling. It has already been mentioned in Chapter I that preventing the smuggling of wood seems to have been a genuine concern. Specifically, *O. Did*.416 mentions an attempt to prevent the smuggling of timber in the port of Myos Hormos. That timber was a common target for smugglers is no surprise since this would have been a critical resource for activities such as cooking and mining.[254] Given the troops which were posted in the Red Sea ports, it is likely that soldiers would have been responsible for seizing any smuggled goods in and around the ports. Aside from wood, smuggled items may well have included pearls and other valuable stones which, De Romanis, astutely observes could have had a very high value, could be easily concealed and were difficult to assess for tax purposes without an expert's knowledge.[255] However, Cuvigny has suggested that the efforts to prevent smuggling may have been more extensive than simply focusing on specific goods.

Instead, she has highlighted that a request by an unknown Ichthyophagos to move his fishing boat was addressed to a *paralemptes* in Myos Hormos for approval.[256] This official was primarily responsible for cataloguing and sealing the cargos of incoming merchant vessels.[257] This official was, therefore, essentially responsible for approving the movement of many goods from the Red Sea ports. As a result, Cuvigny rightly suggests that fishing boats were likely a key component in smuggling operations.[258] This she persuasively suggests was reason enough for the locations of even small fishing boats to be declared to Roman officials, perhaps in an attempt to reduce the impact of smuggling.[259] Given the efforts intended to prevent smuggling and supervise the movement of goods observed in the Red Sea ports, it would seem logical for this mechanism to be in force across the region. To that effect, it is probable that the fee paid to travel in the Eastern Desert discussed throughout this chapter would have served to supervise the movement of goods and prevention of smuggling by having merchants declare their cargos. This would allow us to observe anti-smuggling efforts at both entrances to the Eastern Desert. Indeed, it was also mentioned earlier in this chapter that this may have extended into the Red

[254] Bouchard et al, 2018, p.400.
[255] De Romanis, 2020, p.254-265.
[256] Cuvigny, 2014, p.171-172; *O.MyHo.*inv.512.
[257] For a more extensive discussion of the *paralemptes* see Chapter IV.
[258] Cuvigny, 2014, p.172.
[259] De Romanis, 2020, p.305 also connects the *paralemptai* with having a role in preventing smuggling.

Sea via Rome's garrison on the Farasan Islands. Thus, given the high degree of regulation that was implemented to curb smuggling, it seems only logical, as Young proposes, that the soldiers who manned the *praesidia* would have also been concerned with preventing smuggling. However, rather than this being a primary concern over security smuggling and supervision should rather be viewed as one of several duties.

Conclusion

It has been argued in this chapter that numerous dangers beset the merchants involved in Rome's Indian Ocean trade. These included attacks by the nomadic peoples inhabiting the Eastern Desert known as the *barbaroi* and pirates traversing the Red Sea. Throughout it has been shown that in response to these encounters a complex network of defence was established to provide security. Moreover, it has been suggested that Young rightly proposes that privately hired guards played an important role in providing security for travelling merchants while the military likely observed their movements. However, it has also been argued, in line with Cobb, that the military also had an important role in providing security. Due to increasing attacks from the 2nd century AD onwards these efforts were largely confined to the *praesidia* and the immediate area. Despite this, defending these crucial locations provided security to both the merchants that halted at the *praesidia* for rest and resupply and to the civilians living alongside the garrison. Moreover, that the *praesidia* often contained sources of water made the security of these sites even more vital. However, it is still possible that cavalry escorts could have summoned additional troops in the event of an attack away from a *praesidium*. Thus, Rome's soldiers did much to provide security and stability in the Eastern Desert. Such actions were presumably part of measures that were intended to ensure the collection of tax revenue from the Indian Ocean trade. Moreover, that greater efforts appear to have been made to provide security from the 2nd century AD, a time of increasing attacks by the *barbaroi* suggests that this was, at least initially, a reactive response by the state to a growing environment of hostility.

This chapter has also argued that a similar approach was adopted by Rome's Red Sea fleet. Although the evidence for maritime security is scarce it has been suggested that Rome likely concentrated its warships on the areas where merchant vessels were known to be most at risk of attack. That this was the case is indicated by the author of the *Periplus*. However, it has also been proposed that state efforts were supported by private guards aboard civilian shipping. This would have lessened the otherwise impossible burden of the Red Sea fleet escorting each ship.

Indeed, an ostracon which suggests that trading vessels may have sailed in groups would have ensured maximum security during time away from any patrolled areas.[260] It has been postulated that the Farasan garrison was ideally suited to increase security at the entrance to the Red Sea. Moreover, this position would have allowed Roman soldiers, similarly to their compatriots in the Eastern Desert, to supervise merchants as they left the open ocean. It appears therefore that Rome's navy, like its soldiers, contributed substantially to the security of the Red Sea through a series of measures that were probably implemented reactively in response to the threat of piracy but with the intention of proactively protecting merchants and thus secure revenue in the form of goods returning from the Indian Ocean. Finally, it has been acknowledged that while security was perhaps the foremost concern for Rome's military efforts were made to conduct campaigns against the *barbaroi* and to prevent smuggling in the region. They were, again, likely motivated by a desire to secure state profits from the trade.

[260] Young, 2001, p.58-59 highlights that Aelia Isadora and Aelia Olympias were able to own or rent several merchant vessels perhaps in one season: *SEG VIII* 703. Peppard, 2009, p.5 provides a translation of *P.CtYBR.inv.*624 which concerns ships returning together to the port of Berenike. This suggests that ships may have formed themselves into small fleets.

III.

Potable Water in the Eastern Desert

> The primary concern for travellers through and inhabitants of the Eastern Desert and along the Red Sea coast of Egypt in antiquity was access to and storage and distribution of sufficient quantities of potable water for sustained periods. Without this no other activities would have been possible.[261]

As the quote above notes, Sidebotham and others rightly observe that of all the resources in the Eastern Desert which included precious minerals and metals none was more vital and thus more valuable than potable water.[262] However, due to the hyper-arid conditions of the Eastern Desert, its extreme heat, the lack of reliable sources of freshwater and the very large quantities required the need to collect and manage this resource effectively was of paramount importance.[263] It is critically important, therefore, to determine how this was done and, by whom. One possibility is that this duty was performed by members of the Roman military. Indeed, it has already been noted that the *praesidia* were generally situated around large and reliable sources of freshwater and scholars such as Sidebotham and Broux have argued that controlling these locations were a critical component of military activity.[264] Certainly, evidence such as the so-called 'customs passes' and an inscription from the *praesidium* at Sikyat suggests that there was a high degree of military involvement.[265] This may well have gone beyond simply defending sources of potable water however and potentially included

[261] Sidebotham, 2011, p.87.
[262] Sidebotham, 2011, p.87; Sidebotham, et al, 2008, p.303; Sidebotham, 2003, p.87; Krzywinski, 2007, p.45; Gates-Foster, 2012b, p.736; Wilson, 2015, p.16-17. It should be noted that this chapter focuses specifically on drinking water and contains only a limited discussion of the water used for agriculture, industry, and other activities.
[263] Sidebotham, 2011, p.3.
[264] Young, 2001, p.69-70; Cobb, 2018b, p.92; Reddé, 2018, p.195; Van der Veen et al, 2018, p.358; Sidebotham, 2011, p.100-101. However, Sidebotham, 2011, p.95; 101 notes that some *praesidia* had no wells and so had to request water from other locations. For the military controlling water supplies see Sidebotham, 2011, p.102; 2003, p.101; Broux, 2017, p.145.
[265] Sidebotham, 2011, p.107-108; Bagnall et al, 2001, p.326.

transporting it across the region. If so, it appears that, in addition to providing vital security, Rome's military also guaranteed supplies of potable water. This was arguably the most important prerequisite for the continuation of large-scale Mediterranean trade in the Indian Ocean. For the military to be involved in controlling such a vital resource was, again, feasibly introduced reactively (alongside increasing defensive capabilities in the region) by the state to proactively ensure the collection of future tax revenue. This was done by effectively making merchants dependent on the state for access to the large quantities of potable water which they required.

Potable Water and the Military

Although no surviving military documents address the daily water requirements of Rome's soldiers in the Eastern Desert and the Red Sea directly there is evidence that allows this to be extrapolated. This comes in the form of an ostracon from the quarry of Mons Claudianus.[266] This fragmented document (which has already been referred to) records the quantity of drinking water that was distributed to the quarry's staff daily.[267] This included soldiers, stonemasons, veterinarians and unskilled labourers.[268] Moreover, this ostracon demonstrates that the amount of water depended on the position and rank of the individual concerned. Consequently, while stonemasons received 3.5 litres of drinking water per day an unskilled labourer received only 2.16 litres.[269] However, more importantly for calculating the requirements of soldiers it was shown in Chapter I that *c.*60 of the 917 individuals at Mons Claudianus were military personnel.[270] These seem to have received the largest water ration with each soldier being given 6.5 litres per day.[271] However, as Mons Claudianus had one of the few centurions in the Eastern Desert it is not safe to assume, therefore, that every soldier received this amount. On the other hand, 6.5 litres of water per day closely matches the modern-day requirement of 6 litres for operating in the Eastern Desert and coincides with the amount that was issued to British troops in North Africa during World War II. Thus, it seems that the Romans recognised that a similar

[266] *O.Claud.inv.*1538+2921.
[267] Bülow-Jacobsen, 2018, p.16-18; *O.Claud.inv.*1538+2921.
[268] Tomber, 1996, p.42; Adams, 2007, p.209.
[269] *O.Claud.inv.*1538+2921.
[270] Hirt, 2011, p.182.
[271] Bülow-Jacobsen, 2018, p.16-18; *O.Claud.inv.*1538+2921.

minimum of 6 litres of potable water per day was required by the most active or important personnel.[272]

As a result, it seems reasonable to assume that each soldier in the Eastern Desert and the Red Sea received at least 6 litres of potable water per day with officers such as legionary centurions receiving the highest quota of 6.5 litres. Furthermore, if we apply this ration to the estimated 1,000 soldiers in the Eastern Desert and the Red Sea at any one time during the 2nd century AD then the military alone required *c.*6,000 litres of drinking water per day. Moreover, while the precise number of troops operating in the region may have fluctuated, it is plausible that 1,000 men were present throughout the year and higher numbers might have been needed during the busiest periods of mercantile activity.[273] The busiest period likely ran from late-February to March (when peoples travelling to the Egyptian Red Sea ports started to arrive) to mid-July (the time that Pliny and the author of the *Periplus* record as a key time for departure); although as Cobb notes, natural factors and man-made causes might lead to some (accidentally) departing or arriving late in the season.[274] However, there was traffic all year round, with goods and supplies being continuously brought to and stored at the Red Sea ports (many trade goods were likely stored up in warehouses in anticipation of a new trading season).[275] It is possible, therefore, that at least 1,000 men were deployed in the Eastern Desert and the Red Sea for 365 days a year.[276] This meant that *c.*2 million and 190,000 litres of drinking water could have been consumed by the military during this time.[277] Despite a possible four-month gap which could have allowed for the replenishment of water supplies the requirements for the military alone highlights the logistical challenge and the importance of effective management.[278] On the other hand, this only represented a small fraction of the potable water that was needed.

[272] Bülow-Jacobsen, 2018, p.16-18; Sidebotham, 2011, p.89; *O.Claud.inv.*1538+2921.
[273] Sidebotham, 2011, p.166; *ILS* 9142; *P Mich.III.*203.
[274] Cobb, 2014, p.104-113. De Romanis, 2020, p.67 argues that merchants had very precise sailing times.
[275] Sidebotham, 2003, p.88 has suggested that trade-related activity may have only been reduced for four months a year.
[276] It is certainly possible that this number increased at peak times of activity. On this see Chapter II.
[277] It was also suggested to the author by Professor Dionysius Agius that the volume of drinking water required may have been reduced by the consumption of wine. While Ejstrud, 2005, p.171 lists wine amongst one of the three staple food items in the Roman world it was highlighted to the author by Dr Matthew Cobb that this would have been mixed with water. Therefore, while wine was drunk in the Eastern Desert (see below) this will have only reduced the required water by a small amount. [mixing wine with whatever was a fairly standard practice in the Graeco-Roman world]
[278] Cuvigny, 2014, p.181 mentions a later ostracon which states that were not enough people to refill the cisterns. This suggests that stocking up on water was an important task.

Potable Water and Merchant Caravans

Although it is not representative of the average size of a merchant caravan the Muziris papyrus does, similarly to the ostracon from Mons Claudianus, offer a means by which to infer the quantities of water that were required by the animals transporting the goods.[279] Indeed, while the number of humans in this convoy is unknown the requirements of the animals would have constituted by far the greatest part of the caravan's water-based needs.[280] While fragmented, important information is preserved on both the verso and the recto of the Muziris papyrus.[281] Collectively this information demonstrates that the total value of the goods imported by the Hermapollon amounted to *c.*9 million sesterces.[282] Furthermore, the papyrus records that most of the goods were obtained during a voyage to the Malabar coast.[283] These details have allowed Rathbone and Morelli to estimate the pre-tax weight of the cargo at 150 and 180 tons respectively.[284] These estimates, especially that of Rathbone, are reached by calculating the number and subsequently the weight of items from their stated financial value.[285] However, De Romanis who uses Morelli's careful rereading of the Muziris papyrus claims that previous editors have failed to correctly add an additional item amounting to 771 talents worth of goods to the pre-existing total.[286] For De Romanis, these 771 talents must have been black pepper or malabathrum due to the sheer quantity that is implied.[287] Indeed, although Morelli does account for pepper in his estimate he gives it a much higher value than De Romanis.[288] Certainly, De Romanis' lower valuation is made more plausible by Rathbone's observation from the *Periplus* that the Malabar ports were frequented during the Roman period primarily for pepper and malabathrum.[289] However, the inclusion of this missing product drastically increases the size

[279] *P. Vindob*.*G*.40822.
[280] Adams, 2007, p.103; *P. Oxy.VII* 1049 notes that by the 2nd century each two to three hired donkeys would be accompanied by a single driver although this may not be the same ratio for camels. To this must be added private guards and the merchant themselves.
[281] Mclaughlin, 2010, p.164; Wilson, 2015, p.23; Sidebotham, 2011, p.217; Speidel, 2015, p.104-105; Guruukkal, 2013, p.193; De Romanis, p.2012, 88; *P. Vindob*.*G*.40822.
[282]*P. Vindob*.G.40822. McLaughlin, 2014, p.94 adds 1 million in gems or pearls to the value of the *Hermapollon* cargo but on what evidence this is based is unclear. 9 million is the pre-tax total.
[283] *P. Vindob*.*G*.40822.
[284] Rathbone, 2000, p.45-46; Morelli, 2011, p.227-228. For a concise summary of the debate see Evers, 2017, p.101-104.
[285] Rathbone, 2000, p.45-46; Morelli, 2011, p.227-228.
[286] De Romanis, 2012, p.78-89.
[287] De Romanis, 2012, p.78-89; De Romanis, 2020, p.103 argues black pepper and frankincense were the goods which were imported from trade with the Indian Ocean in the highest quantities.
[288] Morelli, 2011, p.224; De Romanis, 2012, p.88.
[289] Rathbone, 2000, p.45-46; *PME*.56. De Romanis, 2020, p.93 has estimated that the region of Lymrike (which included Muziris) produced *c.*4,000 to 5,000 tons of black pepper per year.

of the Hermapollon's cargo. Indeed, this elevates it from a respectable 150 or 180-tons to an astronomical 625 tons with over 80% of this being comprised of pepper.[290]

More recently, however, Evers, in evaluating these studies, rightly acknowledges that all three proposals are predicated on a degree of calculated guesswork.[291] In Rathbone's case, he assumes that the Hermapollon was a *c.*300 ton vessel, a relatively large size for a ship of Mediterranean origin.[292] Furthermore, to determine that four tons of ivory were stowed aboard the Hermapollon Rathbone utilises the average weight of the tusks of modern-day elephants.[293] Thus, his calculations are based upon known precedent and reasonable hypothesis. On the other hand, De Romanis, despite using the microscopic analysis of the Muziris papyrus conducted by Morelli as the foundation of his analysis, relies on numerous hypothetical suppositions in his estimate of the weight of the Hermapollon cargo.[294] These include a series of complex calculations and conversions in an attempt to determine the weight of each item.[295] It is primarily for this reason that Evers rightly dismisses De Romanis 625 ton estimate for the Hermapollon as being representative of a typical cargo.[296] Furthermore, De Romanis makes clear that he is assessing the Muziris papyrus to validate the existence of very large Roman trading vessels which the author of the *Periplus* notes as having operated off of the Malabar coast.[297]

Consequently, while the *Periplus* remains a key source for Rome's trade in the Indian Ocean (one in which the unknown author of the text was directly involved), De Romanis' clear attempt to concur with his statement based on one of the less legible parts of the Muziris papyrus is not the most stable basis for a reliable estimate. As a result, when calculating the number of animals used to transport cargo and the amount of potable water which they would have required it is reasonable to base estimates on a Hermapollon cargo of 150 and 180 tons. However, an additional problem comes from the fact that both donkeys and camels were used as modes of transport in the Eastern Desert.[298] While donkeys can carry *c.*70 to 90 kilograms, they require

[290] De Romanis, 2012, p.78-89. De Romanis, 2020, p.252 suggests that the Hermapollon carried a cargo of 635 tons. It is worth noting however, that De Romanis, 2020, p.253; 260 notes that a trend for such large ships appeared under Augustus and lasted until the 2nd century AD.
[291] Evers, 2017, p.101-104.
[292] Rathbone 2000: 46; Kotarba-Morley, 2017, p.189; Sidebotham, 2011, p.196.
[293] Rathbone 2000: 46-47.
[294] De Romanis, 2012, p.78-89.
[295] De Romanis, 2012, p.78-89.
[296] Evers, 2017, p.101-104. Kobarta-Morley, 2017, p.192 highlights the logistical difficulties which a ship large enough to carry 625 tons of cargo will have had in navigating the harbour of Berenike but does not dismiss the possibility that they existed.
[297] De Romanis, 2012, p.75-76; *PME*.56.
[298] Sidebotham, 2011, p.91.

*c.*20 litres of water each day. In contrast, a camel can carry between *c.*200 and *c.*335 kilograms while requiring just 10 litres of water daily.[299] Camels would, therefore, appear to be the obvious choice for transporting large or heavy amounts of goods, although donkeys can more easily navigate uneven terrain. On the other hand, a camel can carry far more and needed 50% less water.[300] Nevertheless, while the Eastern Desert roads were not well-constructed, they were not difficult to navigate if kept clear of debris and well maintained.[301] This would have reduced the need to use more nimble transporters in the form of donkeys. Indeed, the Muziris papyrus confirms that camels were primarily used to transport the Hermapollon's goods as the title '*kamelites*' or 'organiser of camels' suggests.[302]

However, even with the increased carrying capacity of camels Evers estimates that 800 animals were needed to carry a 150-ton cargo from the Hermapollon. Moreover, if this cargo weighed 180 tons then 950 animals were required.[303] In contrast, if the goods did indeed total 625 tons then 3,300 camels would have been needed.[304] Either way, as Evers acknowledges, transporting the Hermapollon's cargo represented an immense logistical effort rivalling the caravans of the Early Islamic period. These often comprised as many as 1,000 or 2,000 animals.[305] As a result, if 800 camels were used then some 8,000 litres of water will have been needed each day. Similarly, if 950 camels were required then 9,500 litres of drinking water would have been needed daily. Thus, the water requirement for a merchant caravan, for a single day's journey, not including the needs of guards and others, could still have surpassed those of every soldier in the Eastern Desert and the Red Sea. Furthermore, Pliny states that the journey from Berenike to Coptos took at least 12 days.[306] Therefore, assuming that there were no delays, the animals of the Hermapollon caravan needed somewhere above 96,000 litres or 114,000 litres of drinking water during the journey. This, of course, depended on the size of the cargo with even De Romanis suggesting that the Hermapollon cargo, which in his opinion, did weigh 625 tons there were ostensibly only two ships of this size in operation.[307] Furthermore, while water represented one logistical issue amassing enough animals was another with Evers noting that

[299] Sidebotham, 2011, p.91.
[300] Sidebotham, 2011, p.91.
[301] Sidebotham, 2011, p.136.
[302] *P. Vindob.G.*40822.
[303] Evers, 2017, p.106.
[304] Evers, 2017, p.106; De Romanis, 2020, p.200.
[305] The size of Early Islamic trading caravans was also confirmed to the author during a personal conversation with Professor Dionysus Agius.
[306] Plin.*NH*.6.26.102-103.
[307] De Romanis, 2020, p.202. De Romanis, 2015b, p.139 had previously suggested that less than 12 ships of this size had sailed to India.

the largest privately owned heard of camels included only 26 animals.[308] Indeed, even the well-known company of Nicanor only possessed 36 camels for individual ventures and the largest recorded group of camels numbered only 50.[309]

Nevertheless, Adams highlights that the state could requisition animals at least along the Berenike road.[310] This is how Adams suggests that enough animals were available to guarantee supplies to ports such as Berenike.[311] Indeed, De Romanis has since confirmed that requisitioning camels was how the Hermapollon's cargo (which he estimates required 3,300 camels) was transported. Moreover, De Romanis has suggested that ensuring that enough camels were available was a state service. This is because of his translation of *P. Lond*. 2.328 (the same document referenced by Adams) states that one camel was 'handed… over for the imperial services of the caravans from Berenice.'[312] While De Romanis recognises that this action could have been exceptional and was not done frequently he makes a compelling case that this requisition was regularly done for pepper-carriers (of which he suggests the Hermapollon was one) which returned from southern India. This is because of *P. Lond*. 2.328 clearly stating that multiple caravans were departing only from Berenike which furthermore was the only Red Sea port that could have received a very large ship.[313] Finally, De Romanis points out that the request was made at the time when pepper-bearing ships would have begun their return voyage from the Indian subcontinent. That the request was made at this time would have given time for the camel in question to travel the 900 kilometres separating it from the Red Sea ports.[314]

It should, moreover, be noted that the Muziris papyrus clearly states that the merchant is required to use the lender's contacts.[315] Given that the lender of the loan which financed the Hermapollon's voyage could well have been one of the *paralemptai* it is possible that his contacts could have included members of the imperial administration.[316] This would have allowed him to arrange for the appropriate number of camels before the ship's departure which would have been an essential preparation given the number involved, be it 800, 950 or over

[308] Adams, 2007, p.222-223.
[309] Adams, 2007, p.222-223; *O. Ber*. II.212.
[310] Adams, 2007, p.155; 202; *BGU III* 762 and *P. Lond*.*II*.328.
[311] Adams, 2007, p.215; *P. Lond*.*II*.328.
[312] De Romanis, 2020, p.200.
[313] De Romanis, 2020, p.201.
[314] De Romanis, 2020, p.201-202.
[315] *P. Vindob*.*G*.40822.
[316] De Romanis, 2020, p.309.

3,000.[317] However, such a service was perhaps only available to a very limited number of ships returning from the Indian Ocean trade.[318] Regardless, it is still clear that the camels which transported the Muziris papyrus required access to very large quantities of water. Indeed, if the Muziris papyrus does represent a typically sized cargo (which is unlikely) and 120 such vessels did sail to India at the close of the 1st century BC then, even with catchment basins in the *praesidia* that were capable of holding tens of thousands of litres, the task of providing an adequate amount of potable water looks almost insurmountable. However, this still represented only a part of the potable water that was required.

Potable Water and the Civilian Population

It has been noted that civilians represented a significant part of the Eastern Desert's population. Indeed, a letter from an elderly mother to her son serving in the military makes it clear that this civilian element was comprised of entire families and included employees in the quarries, mines and ports.[319] Despite this, the available evidence does not allow for the size of the civilian population to be reliably estimated. Nonetheless, some evidence does offer an insight into the needs of this part of the population for potable water. Firstly, the population of Berenike (as has already been observed) has been estimated by Sidebotham and Wendrich to have numbered between 500 and 1,000 people by the Late Antique period. This is based on the remains of houses excavated at the site. However, that these date to the 5th century AD, well past the peak of Roman involvement in the Indian Ocean trade, suggests that this is a low estimate for Berenike's earlier population.[320] This is likely true, even after accounting for fluctuations at certain points in the year when merchants departed and returned.[321] Secondly, it has also been mentioned that the quarry of Mons Claudianus appears to have housed a civilian population of *c.*840 during the 1st century AD.

Aside from offering further insights on the size of the Eastern Desert's civilian population the ostracon from Mons Claudianus (which has already been discussed) also provides important clues about how much potable water these civilians might have consumed. This document

[317] De Romanis, 2020, p.172.
[318] It is worth remembering that if De Romanis' calculations for the size of the Hermapollon's cargo is correct then this one vessel represented some four million sesterces in tax. This would have likely justified such attention from the state.
[319] Sidebotham, 2011, p.76-77.
[320] Cobb, 2015a, p.403-407.
[321] Cobb, 2014, p.104-106; Sidebotham, 2011, p.68.

makes it clear, as has been observed, that the daily water ration was assigned based upon role and rank and distributed a minimum of 2.16 litres of water to unskilled workers. This indicates, therefore, that as a minimum, civilians in Berenike and at Mons Claudianus presumably received 2.16 litres of drinking water a day. This would have increased demand by an additional 4,974 litres at just these two sites thus suggesting that the civilian population would have required tens of thousands of litres of additional drinking water each day. Indeed, these figures do not account for the needs of outgoing merchant vessels which would have required stocks of potable water.[322] It is clear from the proceeding discussions therefore that ensuring supplies of potable water was a gargantuan task. As a result, a sophisticated system would have been required to ensure efficient collection and storage.

Collecting and Storing Potable Water

Given the volume of potable water that was needed it is fundamental to recognise that the Eastern Desert is, as a region, singularly unfavourable for amassing the amount required. Indeed, it is described by modern excavators as a 'desiccated and hyper-arid' environment that has an average modern-day temperature of upwards of 45 degrees Celsius during the high summer.[323] Scholars tend to infer, moreover, that these conditions were prevalent during the Pharaonic, Ptolemaic and Roman periods.[324] Moreover, an average precipitation level of four to five millimetres per year has been measured at Quesir on the Red Sea coast.[325] Precipitation in the Eastern Desert, in contrast, ranges from three to 25 millilitres per year.[326] However, due to the high temperatures and low precipitation, this leads to an evaporation rate exceeding one hundred times the heaviest annual rainfall.[327] Additionally, the concentration of already limited precipitation around November and early December causes large-scale flash flooding. This added to the already significant environmental challenges for past and present inhabitants.[328]

Due to these conditions the Romans, and the Ptolemies before them, by necessity, needed to utilise every means at their disposal to find, collect and securely store potable water. After

[322] Sidebotham, 2011, p.104 has suggested that the *praesidium* at Mons Ophiates could supply water for *c.*440-586 people but that once animals are added this will have likely reduced the population to 100 or 200 with 100 being the more likely.
[323] Gates-Foster, 2012, p.736; Sidebotham, 2011, p.3; Maxfield, 2002, p.143.
[324] Sidebotham et al, 2008, p.24-26.
[325] Sidebotham et al, 2008, p.24-26.
[326] Sidebotham, 2011, p.92. Maxfield, 2002, p.143 states that precipitation is normally less than 5mm per year.
[327] Sidebotham et al, 2008, p.24-26.
[328] Sidebotham et al, 2008, p.24-26.

decades of activity in the Eastern Desert Sidebotham observes that this could be done in one of several ways. This included collecting rainwater run-off from the mountains, using quluts (naturally hollowed-out rocks which collected water run-off) and natural springs fed by sub-surface water.[329] However, Sidebotham rightly notes that such sources, while useful, were somewhat unreliable with one natural spring only being able to produce 10 litres of water a day.[330] Despite this, Krzywinski has postulated that surface water harvested with hafirs (man-made basins) could have formed an important means of collecting water.[331] While it is likely that this was not potable, water obtained from these sources may have helped to offset the use of water from the wells on gardens.[332] In support of this proposition, Krzywinski highlights several sites with architectural features possibly associated with hafirs. Moreover, Krzywinski analyses a build-up of sediment at other locations that are suggestive of additional sites.[333] However, Krazywinski acknowledges that his hypothesis requires further research to substantiate.[334] Nonetheless, this proposition is promising and should be added to a list of possible means by which Romans acquired water in the Eastern Desert.

Regardless, large sub-surface wells constituted the principal means for the Romans to access potable water. While these varied in size many could hold thousands or even tens of thousands of litres. Indeed, examples indicate that these could range from storing *c.*10,000 litres (Mons Claudianus) to *c.*39,000 (Rod Umm al-Faraj) and *c.*200,000 litres (Krokodilo).[335] What this shows, therefore, is that the well of Krokodilo alone could have provided almost enough water for two caravans of the larger size discussed above. Thus, it appears that the Romans and doubtless the Ptolemies before them made sure to be capable of collecting and storing potable water on a scale equal to their requirements. Nevertheless, great care still needed to be taken when it came to storing water once it had been collected. To this end, many of the surviving wells are encircled by low stone walls. These features, it has been suggested, rather than being to prevent people or animals from falling into the well was likely to prevent contamination.[336]

[329] Sidebotham, 2011, p.92-93.
[330] Sidebotham, 2011, p.92-93.
[331] Krazywinski, 2007, p.47; 48; 53.
[332] While Krazywinski, 2007, p.53 does not explicitly argue that water from hafiers was used for human consumption he sees it as unlikely that it was only used for agriculture.
[333] Krazywinski, 2007, p.49-53.
[334] Krazywinski, 2007, p. See also Sidebotham, 2011, p.97 for a critique of Krazywinski's suggestions.
[335] Cobb, 2018b, p.95; Sidebotham, 2011, p.105.
[336] Sidebotham, 2011, p.103.

Sidebotham has also suggested that some sort of cover was used to prevent evaporation.[337] Sidebotham proposes that these may have been leather constructs over a wooden frame. Furthermore, while he acknowledges that this suggestion is speculative since no covers have been found in association with the wells the cisterns do appear to have been covered. This makes Sidebotham's suggestion more plausible. Indeed, those cisterns which survive from Roman sites across the Eastern Desert certainly show the level of concern for safely storing potable water. This is because they appear to have been constructed with a waterproof lining of lime plaster for preventing leaks. Finally, Roman-era cisterns seem to have frequently been divided into several tanks. This was potentially designed to reduce the risk of collapse or an overflow of water.[338] Thus, it seems clear that great technical efforts were made to safely store collected water despite the immense environmental challenges. Such a complex and carefully considered system of collection and storage of a key resource almost certainly required constant management and control. The evidence suggests that this was done by Rome's armed forces.

The Military and the Control of Potable Water

When it came to controlling and distributing potable water scholars such as Sidebotham, Bagnall and Cuvigny, among others, propose that this was done exclusively by members of the military.[339] Certainly for ports such as Berenike and Myos Hormos, importing potable water was a vital concern since the water at these locations was, then and now, too saline for human consumption.[340] As a result, some *c.*240 of the ostraca recovered from Berenike, relate directly to the delivery of potable water. However, none of these offers any insights into who performed this critical task.[341] What is certain however is the military's role in the provision of the infrastructure for the acquisition and preservation of water. This is clear from an important inscription found at Sikyat, a *praesidium* some 7.5km from the Berenike.[342] The Sikyat inscription commemorates the construction of a *hydreumata* in 77/78 AD:

[337] Sidebotham, 2011, p.105.
[338] Sidbeotham, 2011, p.106.
[339] Sidebotham, 2003, p.95-96; 101; Sidebotham et al, 2008, p.310-311; Sidebotham, 2011, p.102. See Bagnall et al, 2001. While they do not specifically link the military to the collection and distribution of water the title of the paper 'Security and Water on the Eastern Desert Roads' certainly implies a similar view.
[340] Bagnall et al, 2001, p.329; Sidebotham et al, 2008, p. 314; Sidebotham, 2011, p.101-102.
[341] Bagnall and Ast, 2016, p.29.
[342] Bagnall et al, 2001, p.329; Sidebotham, 2011, p.102.

> In the 9th year of Imperator Caesar Augustus Vespasianus, L. Iulius Ursus, prefect of Egypt, returning from Berenike gave instructions for a well to be sought in this place. When it had been found, he ordered a fort and cisterns to be constructed under the direction of M. Trebonius Valens, prefect of the desert region of Berenike.[343]

While this inscription does not explicitly confirm that the military distributed water to Berenike it does imply a strong connection between the presence of soldiers and the control of an important source of potable water. This site is, moreover, important for several reasons. This is because it demonstrates, firstly, that ensuring a supply of potable water for Berenike was a concern for the Egyptian Prefect, the chief official and supreme commander of the province.[344] Secondly, Bagnall, Bülow-Jacobsen and Cuvigny argue that the Sikyat inscription represents the earliest reference to a *praesidium* in the Eastern Desert.[345] This is important because it suggests that not only did Ursus wish to construct a new *hydreumata* he also wished for it to be placed under military control. Furthermore, while the term *praesidium* is frequently translated by scholars as 'fortlet' Symonds highlights that the literal translation is 'garrisons.'[346] This, therefore, supports making a close connection between Rome's military and control over sources of potable water. Tightly controlled locations such as Sikyat, as has already been observed, would have been crucial for cities such as Berenike.[347] Nonetheless, it is important to recognise that while the military may have controlled many of the major sources of potable water this does not indicate that soldiers were responsible for distributing it across the Eastern Desert.

This situation is still not clarified, at least initially, when looking at the documents recovered from the *praesidia*. Indeed, of the 2,400 ostraca which have been found very few of them mention water at all.[348] Instead, the majority reference food and many are letters from the occupants of a *praesidium* requesting various goods such as fish, wine and other items.[349] In

[343] Bagnall et al, 2001, p.327, translation Bagnall et al, 2001.
[344] See Chapter IV on the status of the Prefect of Egypt.
[345] Bagnall et al, 2001, p.331.
[346] Symonds, 2017, p.12; Cobb, 2018b, p.17.
[347] Sidebotham, 2011, p.102 Myos Hormos likely sourced its water from several nearby *praesidia* at Bir Kareim.
[348] Young, 2001, p.69; Reddé, 2018, p.194.
[349] Adams, 2007, p.212; *O. Claud. I* 137-171; *O. Claud. II* 214; 255-278.

contrast, where potable water is mentioned it is in dire circumstances and with great urgency as one ostracon implores:

> Please send us water by the wagons because we are short and have nothing to drink, and please see that you send it quickly.[350]

Where this message highlights the importance of potable water in the Eastern Desert that many *praesidia* enclosed their own *hydreumata* suggests that this document is unusual. On the other hand, Sidebotham has observed that several of the *praesidia* on the Coptos to Berenike road did not have *hydreumata*. Instead, they seem to have obtained water via channels built to direct run-off into cisterns.[351] As a result, Sidebotham suggests that these sites either housed only small garrisons or were periodically abandoned.[352] Either of these suggestions is possible given that the size of garrisons might fluctuate throughout the year and due to the difficulties associated with transporting enough potable water for even a small contingent of soldiers.[353] Regardless, this, along with the example quoted above suggest that most *praesidia* were expected to rely on their own *hydreumata* to supply them with potable water. Despite this, it is apparent from *M*689 that there were occasions in which water had to be transported between the *praesidia*. This could be done in at least two ways, both of which, appear to have involved the military. The first of these, as the ostraca from the *praesidia* show, is via the so-called postal service. This was comprised of cavalrymen who rode between the *praesidia* to deliver official communications. These included reports warning of nearby *barbaroi*.[354] Of the soldiers stationed at Krokodilo, three of these were designated as couriers of the postal service.[355] However, in addition to their official duties of delivering letters between the *praesidia*, these riders also delivered other items such as fresh fish.[356] Moreover, Bülow-Jacobsen

[350] *M*689, translation Symonds 2017.
[351] Sidebotham, 2011, p.95.
[352] Sidebotham, 2011, p.95.
[353] See Chapter I. Based on the calculations outlined above even the smaller praesidia garrisons of 15 soldiers would need *c.*90 litres of water per day. In contrast, Sidebotham, 2011, p.93 refers to modern day Bedouin locating natural springs which produce *c.*10 litres of water per day.
[354] Bülow-Jacobsen, 2013, p.562; Sidebotham, 2011, p.152; *O. Krok*.1-4. Adams, 2007, p.210 sees *O. Claud I* 142 as evidence that these couriers may also have ridden camels.
[355] Bülow-Jacobsen, 2013, p.563.
[356] Bülow-Jacobsen, 2013, p.563; *O. Krok*.1.

has shown that these postal workers could carry up to 20 kilograms of goods on such journeys.[357]

On the other hand, it is unlikely that this quantity was carried regularly since it could have slowed an otherwise very fast and scheduled system.[358] Significantly, one request for a skin of water to be sent confirms that the soldiers involved with the postal service delivered potable water.[359] Thus, it is not impossible that, in an emergency such as the one referred to in *M*689, the postal service could have quickly transported potable water to a *praesidium* in need. However, as was hinted at above, even a small garrison required a large amount of water. For example, a garrison of 15 men still needed as much as 90 litres per day.[360] Consequently, even if all three of the postal officers from Krokodilo carried 20 kilograms of water this would only have provided two-thirds of the garrison's requirements for a single day.[361] Thus, while the military was certainly involved in supplying potable water to the *praesidia* this only represented a small supplement to those without a *hydreumata*. As a result, in cases such as these and the Red Sea ports where huge amounts of drinking water were required a larger effort perhaps, as is discussed below, involving wagons would have been needed. This also potentially involved members of the military.

In addition to the efforts of the postal service and private merchants, most of the food consumed in the Eastern Desert seems to have been delivered by a system of state-organised caravans.[362] This appears to have included at least four separate caravans delivering to Mons Claudianus, Berenike, Myos Hormos and the *praesidia* lining the Coptos to Berenike road.[363] However, given the number of active sites during the Roman period, there may well have been additional caravans delivering to sites such as Mons Porphyrites and along the Coptos to Myos Hormos road.[364] These caravans moreover,

[357] Bülow-Jacobsen, 2013, p.562; 2003, 403.
[358] Bülow-Jacobsen, 2013, p.563; *O. Dios inv.*39.
[359] Bülow-Jacobsen, 2013, p.565; *O. Did* 361.
[360] This is if we assume an average of 6 litres per man for a single day.
[361] Personal experience of the author has shown that a single litre of water weighs 1kg.
[362] Adams, 2007, p.206-207. Several letters demonstrate that numerous Nome officials were concerned with shipping grain to the communities of the Eastern Desert: *SB XIV* 12169; *P. GISS III* 69; *P. Oxy XLV* 3243. Van der Veen and Dyer, 1998, p.101-102 has shown that, at least at Mons Claudianus, the archaeological material shows that a wide range of foodstuffs was available.
[363] Mons Claudianus: *O. Claud II* 245; 273 278; 375; 376. Berenike: Evers, 2017, p.105-106 using Sidebotham and Wendrich, 1998, P.85-96 to estimate that Berenike needed 80-160 camels a month to supply a population of 500-1,000 people. Myos Hormos: *O. Max* 4 = *SB XXII* 15455.
[364] Since Mons Porphyrites seems to have been the administrative centre of mining in the Eastern Desert it seems unlikely that it did not have its own supply train.

were likely to have been very large. If every individual received 1 *artabas* of grain per month then 150 camels would have been needed for the 900 people at Mons Claudianus and 80 or 160 would be needed for the 500 or 1,000 people at Berenike.[365] An additional 30 camels would then have been needed to supply the 11 garrisons, each of 15 men, on the Coptos to Berenike road.[366] Given the logistical challenge of this, it makes it worth mentioning once again that the largest known herd of privately owned camels in the Eastern Desert were the 26 belonging to the Nicanor company. Nevertheless, it is reasonable to suggest that the potable water required by the Red Sea ports was probably also imported to cities such as Berenike via these supply trains.

That this was the case is suggested again by *M*689 which requests that the recipient 'send water by 'the wagons.' This kind of phrasing matches many letters that reference the supply caravans. Here they are frequently referred to as 'the caravan.' This suggests that 'the wagons' mentioned in *M*689 could have potentially belonged to this caravan.[367] If this was the case, however, then this contradicts the image of supply caravans comprised of heavily laden camels. On the other hand, other documents do refer to 18 wheeled wagons being used. These Peacock has suggested, were used to transport immensely large and heavy stone columns from the quarries.[368] Furthermore, where there has been some debate about what animals were used to haul the product of the quarries, Adams highlights the work of Cotterell and Kaminga which has shown that camels make very capable draft animals.[369] Indeed, camels can haul an estimated 1,000 kilograms and so 40 animals could have moved columns from Mons Porphyrites which one extant example shows could weigh as much as *c.*207 tons.[370] Moreover, Adams has suggested that, given the difficulties of assembling additional animals, the caravan which delivered columns from the quarries also acted as the state's supply train on its return journey.[371] This logical proposition would confirm, therefore, that at least some of the supply trains used wagons.

[365] Adams, 2007, p.209; Bülow-Jacobsen, 2013, p.564; Tomber, 1996, p.42; Evers, 2017, p.105-106.
[366] Bülow-Jacobsen, 2013, p.564.
[367] *O. Did* 345; *O. Did* 404.
[368] Peacock, 1997, p.261-263 suggests that these wagons could carry columns weighing as much as 207 tons. Adams, 2002, p.176 agrees with this.
[369] Adams, 2007, p.205; Cotterell and Kamminga, 1992, p.206-214. Maxfield, 2002, p.158-159; *P. Oxy*.498 agrees that camels may have been used to haul stone but argues that this was also supplemented with human labour. The notion of using human labour to haul columns was first suggested by Peacock, 1997, p.264.
[370] Adams, 2007, p.205; Cotterell and Kamminga, 1992, p.206-214.
[371] Adams, 2007, p.209.

Furthermore, it suggests that the same supply caravans were involved in delivering potable water to any *praesidia* in need.[372]

These supply trains appear to have been escorted by soldiers who formed some sort of patrol. This is referred to in the ostraca by the Greek term *probole*.[373] This has been translated by scholars as 'horse patrol' but etymologically can refer to anything that is thrust forward either offensively or defensively.[374] The *probole,* Sidebotham has proposed, was possibly an armed patrol of an unknown size comprised either of soldiers or non-military personnel.[375] Similarly, in a 2003 article Bülow-Jacobsen has argued that the *probole* was a cavalry patrol.[376] However, he has since modified his view and has suggested that the *probole* was, for several reasons, not made up of cavalry.[377] The first reason is that the author of one letter states that he will travel with the *probole* because he is 'not pressed for time.'[378] To Bülow-Jacobsen, this indicates that the patrol was not comprised of cavalry which would presumably have travelled at a high speed.[379]

Secondly, Bülow-Jacobsen has suggested that the *probole* was not comprised of mounted horsemen because of ostraca which show that the patrol transported a variety of goods between locations such as grain, rope, an amphora and even people.[380] Nevertheless despite this emphasis on transporting goods Bülow-Jacobsen highlights ostraca which demonstrates that the *probole* was not comprised of donkeys either.[381] Based on this Bülow-Jacobsen instead suggests that the *probole* was some form of slow-moving military patrol which was accompanied by donkeys that he proposes were organised differently to the free-roving drivers trading between the *praesidia*.[382] It seems, therefore, that the *probole* was some form of armed patrol which was likely tasked with screening the supply caravans and providing security. However, there is no reason, in contrast, to

[372] As noted above Mons Claudianus possessed its own well and so will not have needed to import water at least on a large scale.
[373] Bülow-Jacobsen, 2013, p.566-567; Sidebotham, 2011, p.152; *O. Claud II* 227; 279; 375; 376; 380; *O. Max inv.*89; *O. Did* 462; *O. Dios inv.*106; 382. Adams, 2007, p.210 appears to similarly connect the *probole* with the delivery of goods throughout the desert.
[374] Bülow-Jacobsen, 2013, p.566-567; Bülow-Jacobsen 2003 cited in Bülow-Jacobsen, 2013, p.566-567; Sidebotham, 2011, p.152.
[375] Sidebotham, 2011, p.152.
[376] Bülow-Jacobsen, 2003 cited in Bülow-Jacobsen, 2013, p.566-567.
[377] Bülow-Jacobsen, 2013, p.566-567.
[378] Bülow-Jacobsen, 2013, p.566-567; *O. Max inv.*89.
[379] Bülow-Jacobsen, 2013, p.566-567.
[380] Bülow-Jacobsen, 2013, p.566-567; *O. Dios inv.*106; *O. Claud II* 227; *O. Claud II* 367; *O. Dios inv.* 382; *O. Did* 462; *O. Claud* 279.
[381] Bülow-Jacobsen, 2013, p.566-567.
[382] Bülow-Jacobsen, 2013, p.565; *O. Krok.inv*.252; 603.

Bülow-Jacobsen's proposal that the *probole* could not have been comprised of horsemen or given the setting, camel riders.

The first reason for this is because if the purpose of the *probole* was to provide advance security for the supply caravans then it should be no surprise that it would have moved relatively slowly so as not to put too great a distance between themselves and the caravan. The second reason is that, as has already been seen, with the soldiers of the postal service, individuals mounted on horses, could still transport up to 20 kilograms of goods. This would have enabled members of the *probole* to carry modest consignments of grain or even a small amphora of wine. Furthermore, frequently transporting such goods in exchange for a fee would have offered soldiers an appealing supplement to their salaries. In terms of the ostraca showing that people accompanied the *probole,* it is possible that these individuals may have been able to pay a fee to travel alongside assuming they had the means to keep up.[383]

Both Bülow-Jacobsen and Sidebotham are uncertain who made up the *probole* or how large it was.[384] Although it is possible that the *probole* was made up of privately hired guards this does not seem plausible. This is because the supply caravans seem to have been state-sponsored and carried crucial supplies such as food and water to the Red Sea ports and other sites.[385] Indeed, while Bülow-Jacobsen very rightly suggests that postal riders probably had to assist in escorting the caravans the three soldiers recorded as being stationed at Krokodilo probably did not represent the entire *probole*.[386] Instead, it is possible, although there is no extant evidence that confirms this, that the *probole* was comprised of mounted soldiers drawn from garrisons outside of the Eastern Desert. Where many of these troops likely garrisoned the *praesidia* involvement in the *probole* could explain the placement of a cavalry *alae*, notionally of 500 men, at the city of Coptos. This was the main gateway into the Eastern Desert and one of the points where the supply caravans presumably entered the region.[387] Similarly, the inclusion of 163 cavalry with the forces placed at Contrapollonopolis which was located close to the old Ptolemaic entry point of Apollonis Maga could suggest that these troops were also

[383] While Adams, 2007, p.101; 103 has shown that purchasing a donkey was a major investment he suggests that hiring them would be much more affordable. Moreover Adams, 2007, p.111-112 references an unpublished ostracon showing that donkeys were sold in Berenike during the reign of Nero.
[384] Bülow-Jacobsen, 2013, p.566-567; Sidebotham, 2011, p.152.
[385] See Chapter II for a discussion of the involvement private guards in the Eastern Desert.
[386] Bülow-Jacobsen, 2013, p.564; *O. Did* 345.
[387] Sidebotham, 2011, p.260; Dijkstra and Verhoogt 1999, 208-218; Pantalacci, 2018, p.19; *I. Portes.*56.

involved in escorting supply caravans.[388] Although these escorts were likely not large they were certainly larger than the patrols which the ostraca show could be sent into the Eastern Desert.[389] Assuming that these suppositions are correct then members of the military were intimately involved in supplying the Eastern Desert and the Red Sea with food and, crucially, with water.

Finally, Sidebotham and Maxfield have tentatively suggested that access to potable water was regulated via the so-called customs passes.[390] Indeed in Sidebotham's view, this task was performed by soldiers. These ostraca, which have been recovered in large numbers from Berenike, appear to have acted as 'let-pass orders' for merchants transporting goods through the Eastern Desert for export at the Red Sea ports.[391] Where there is some degree of variation in these documents Nappo has separated these into three distinct categories:

1. To Andouros, *quintanensis*, let pass of Tiberius Claudius [Achilleus] Dorion for Paouos son of Paouos, 10 *italika*, total 10 *ital(ika)*.[392]
2. Sosibios to Andouros, greetings. Let pass for Andouros son of Pach () 6 *italika* of wine.[393]
3. Robaos to those in charge of the customs gate, greetings. Let pass for Haryothes for outfitting, 8 *rhodia*.[394]

These examples demonstrate that passes, which appear to have been issued on goods such as wine, which acted as both supplies on ship and as an export item to various ports in the Indian Ocean, were likely issued on just about all the goods that were destined for export to the Indian Ocean market. These, moreover, would need to be carried by merchants when travelling in the Eastern Desert.[395] Asides from providing a glimpse of the nature of Roman exports these passes also offered a means for legitimate merchants

[388] Manning, 2011, p.5.
[389] Sidebotham, 2011, p.151; Cobb, 2018b, p.110; Cuvigny, 2005, p.25; 77;82; 94; 154; *K*458; 315; 519a.
[390] Sidebotham, 2003, p.101-102. Maxfield, 2002, p.160-161.
[391] Nappo, 2017b, p.561; Cobb, 2018b, p.21; Nappo and Zerbini, 2011, p.63-65.
[392] Nappo, 2017b, p.561-562; Nappo and Zerbini, 2011, p.65; *O. Ber* 51, translation Nappo 2011.
[393] *O. Ber* 11, translation Nappo 2011.
[394] *O. Ber* 36, translation Nappo 2011.
[395] Nappo, 2017b, p.561; Cobb, 2018b, p.21; 220-226; Curtius Rufus 8.9.30; Lucian, Nigrinus.5; *PME*. 6; 7; 17; 24; 28; 39; 49; 59; Nappo and Zerbini, 2011, p.63-65.

to be identified and thus potentially limit or enable their access to water. While Strabo states that merchants would carry their own supply of potable water it was highlighted above that a caravan of several hundred camels would have needed a huge amount. This would have necessitated regular stops at the *praesidia*. These locations, it has been established, were controlled by the military. It is on this basis that Sidebotham suggests that the customs passes were used to dictate who could access a *praesidium* and its supplies of potable water.[396]

In support of this theory, Sidebotham points out that the Coptos Tariff charges were applied to various individuals, items and goods for permission to travel the desert roads.[397] Amongst those people and items that were taxed were a prostitute, a guard and a ship's mast.[398] While this list does not reference potable water Sidebotham's hypothesis suggests that it was included in the cost of a pass.[399] Indeed, given the prerequisite for additional water and despite the lack of definite evidence this proposition is certainly not an unreasonable one. Moreover, the passes seem to have been frequently addressed to the *quintanenses*. These individuals were the officials in charge of the customs gate of Berenike and were also members of the military.[400] Thus, it may be that the presentation of a pass addressed to the *quintanenses* would have ensured that the commander of a *praesidium* would have permitted the holder access to water.[401] It is possible therefore that members of the military not only delivered drinking water but may even have directly regulated access to it. Given the certain need to obtain water this measure would, more than any other, have ensured that the state received the appropriate tax revenue.

Non-Potable Water Use

While it has not been the focus of this chapter it is nonetheless still important to consider the use of water for purposes other than drinking. This is because it will have only further increased demand. Where water was used on small gardens to grow food locally some of

[396] Sidebotham, 2003, p.101-102. Maxfield, 2002, p.159-160 also suggests this.
[397] Sidebotham, 2003, p.101; *OGIS* 674.
[398] *OGIS* 674.
[399] Sidebotham, 2003, p.101-102; *OGIS* 674.
[400] Nappo and Zerbini, 2011, p.69-70; *P. Gen. Lat.* I; *CIL* 137749; *CIL* 14, 2282. Bagnall et al, 2000, p.8-12; Nappo and Zerbini, 2011, p.64; Nappo, 2017b, p.561; *O. Ber* 11; 36.
[401] Maxfield, 2003, p.163; *I. Pan* 20; 42; *CZL* I11 75 = *ILS* 4424.

the largest consumers of water were potentially cooking and bathing.[402] On the other hand, no extant evidence offers figures for this during the Roman period. Sidebotham has, however, observed that a modern excavator consumes between four and nine litres of water per day for cooking and bathing during the summer.[403] It has already been seen in this chapter that ancient requirements of drinking water were, in some cases, on par with the modern-day. Despite this, the amounts which were required for cooking are uncertain. However, several small bath complexes have been found in some of the better-excavated *praesidia*.[404] This might allow for a sense of the water requirements for bathing. These baths were generally small with the 48 square metre examples at Dios being the largest in the Eastern Desert. However, these installations were clearly sophisticated, and some boast a well-preserved *caldarium* and *frigidarium*.[405] These complexes will, therefore, have required hundreds of litres of water. Regardless, it was Rome's mining operations in the Eastern Desert which, perhaps, reserved the potential to consume the greatest volume of water asides from drinking.

It has been observed that mining for gold in the Eastern Desert seems to have entered a period of decline under Rome compared to her Ptolemaic predecessors. Regardless, this activity will still have required substantial quantities of running water in order both to wash the gold ore out of freshly powdered quartz and to excavate mine shafts.[406] While Klemm and Klemm have proposed that a method of washing the gold ore akin to that of the modern Bedouin might have been used it seems unlikely that this was the only method. This is because while this method, which uses a sheep's hide to catch the gold ore and then burns the hide to separate the gold ore, is effective the proximity of wells to active mines suggests that this water was also used.[407] Indeed, Diodorus' confirms that the Ptolemaic miners used water to separate the gold ore and it seems unlikely that the Romans would not have done the same.[408] The amount of water that was needed for such a process was substantial.

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[402] Krzywinski, 2007, p.48-49. Cappers cited in Krzywinski, 2007, p.48 has argued that these gardens were watered using wastewater. Cappers, 2006, p.46 reiterates this view although about the modern gardens. In contrast, Sidebotham, 2001, p.108 has argued that they were watered from the cisterns.
[403] Sidebotham et all, 2008, p.304.
[404] Reddé, 2018, p.197-204 shows that bath complexes have been found at Maximianon, Didymoi, Dios and Xeron
[405] Reddé, 2018, p.202.
[406] Vanhove and Mussche, 2002, p.27; Klemm and Klemm, 2013, p.8.
[407] Klemm and Klemm, 2013, p.8; 15.
[408] Diod.3.12.1-14.4.

Although only a few examples of washing tables have so far been found in Egypt's Eastern Desert *c.*250 washeries have been found at Lavriotiki in Attica most of which are associated with the Athenian silver industry.[409] Certainly, activity in the Eastern Desert of Egypt in the Roman period did not reach the scale of silver mining by Athens in the Classical period, which left the state with a surplus of at least 50 talents.[410] Nevertheless, Rome's gold mines in the Eastern Desert would still have required a large volume of water and it has been suggested that evidence of additional washeries remains to be found.[411] Indeed, Pliny records that entire aqueducts and rivers could be used to excavate new Roman mine shafts such as those at Las Medulas.[412] If this represents the upper end of requirements then even a small scale industry would certainly have represented a major drain on water supplies in a hyper-arid environment such as the Eastern Desert.

Conclusion

This chapter has argued that not only did millions of litres of potable water need to be collected and carefully stored much of this activity involved the use of soldiers. These troops seem to have conducted a variety of tasks including responding to urgent requests for potable water. These requests were met by members of the military-run postal service. However, these tasks also appear to have extended to providing security to the supply caravans delivering food and water to the ports and quarries. Also, it is possible that the soldiers manning the *praesidia* were responsible for regulating access to potable water although this is yet to be proven. Nevertheless, it is clear from their involvement in collecting, transporting, and controlling water that, as some have suggested, the military sought an almost total monopoly over this critical resource. This monopoly, one which would have dictated the continuation of activity in the Eastern Desert and the Red Sea presumably arose from the reactionary increase in military personnel in the region from the 2nd century AD and was intended to attempt to proactively ensure the collection of future tax revenue from the Indian Ocean trade. This was done by ensuring that access to potable water was effectively controlled by the state.

[409] Sidebotham et al, 2008, p.220; Vanhove and Mussche, 2002, p.27.
[410] Bissa, 2009, p.51; Hdt.5.97. Hd.7.144 states that the surplus from Laurion was enough to pay for a fleet of 200 triremes.
[411] Sidebotham et al, 2008, p.220.
[412] Thommen, 2012, p.121; Plin.*NH*.33.67.

IV.

The State Officials of the Eastern Desert, the Red Sea, and the Indian Ocean Trade

> testimonies emphasize more or less explicitly the political and economic importance of trading links and activities within and beyond the boundaries of the Empire… the state was very actively and self-consciously involved in this aspect of empire.[413]

It has been shown that Rome deployed a large percentage of its soldiers in Egypt to the Eastern Desert and the Red Sea. Moreover, it has been argued that these troops performed several crucial roles such as providing security to merchants and managing the supply of potable water. These activities, it has been suggested, were reactive measures that were implemented by the state in response to an increasingly hostile situation to proactively ensure the collection of future tax revenue from the Indian Ocean trade. However, the military personnel stationed in the Eastern Desert and the Red Sea were overseen by a complex network of state officials while these tasks were conducted. These officials (such as the Prefect of Berenike) have been frequently referenced throughout this thesis. Indeed, previous attempts to survey state involvement in the Indian Ocean trade have regularly focused on the centralised investments in physical infrastructure which were overseen by these officials.[414] This chapter, in contrast, examines the functions of these officials to identify those activities which were overseen by the state. Moreover, it will also be highlighted how these functions changed over time. As a result, it will be seen that while the military was responsible for providing security and controlling potable water these actions were overseen by an extensive hierarchy of state officials. This hierarchy was, furthermore, assumedly another reactive creation on the part of the Roman state to proactively ensure the collection of future tax revenue.

[413] Wilson and Bowman, 2017, p.2.
[414] Wilson, 2015, p.20;21; 31; Cobb, 2018a, p.106-108; 126; Sidebotham, 1986, p.113-174.

The Nature of Government Under the Roman Empire

Following the downfall of the Republic, the Emperor sat at the pinnacle of Rome's government. On the other hand, while the Emperor was the central figure his efforts were supported both by members of the imperial court and the regional administrations. Work by Millar has shed significant light on the nature of this relationship and has greatly influenced subsequent scholarship on Rome's government during the imperial period.[415] Nevertheless, a reasonable premise of how the central government operated is provided by Aelius Aristides who wrote during the 2nd century AD:

> And if the governors should have even some slight doubt whether certain claims are valid in connection with either public or private lawsuits and petitions from the governed, they immediately send to him (the emperor) with a request for instructions what to do, and they wait until he provides a response, like a chorus waits for its trainer. Therefore, he has no need to wear himself out by traveling around the whole empire, nor, by appearing in person, now among some, now among others, to make sure of each detail when he has the time to tread their soil. It is easy for him to stay where he is and manage the entire civilized world by letters, which arrive almost as soon as they are written, as if they were carried by winged envoys. [416]

This passage reflects the fundamental changes in Rome's government following Octavian's victory at the Battle of Actium in 31 BC and the establishment of the Principate shortly thereafter.[417] Despite notionally being the first citizen of a restored Republic, as is indicated by Octavian's (later given the honorific title Augustus) *Res Gestae,* it is shown in a more material sense by Augusts' issues of coinage that the Principate became, practically speaking, an established monarchy.[418] Moreover, that this imitated the style of the eastern Hellenistic kingships is shown by the language used in addresses to the Emperor, the trappings of power such as the imperial palace, the establishment of an imperial court and a monopoly over the

[415] Millar, 1992, p. ix.
[416] Ael.*Or*.26, translation Corcoran 2014.
[417] Potter, 2009, p.162; 165-168.
[418] Rowe, 2006, p.114; Wolters, 2012, p.342; Paterson, 2007, p.121; Aug.*Res*.1.

armed forces.[419] Nevertheless, at a practical level, as Aelius' passage indicates that the Roman Empire was run by appointing officials, secretaries and governors who were then spread throughout the provinces.[420] While it is apparent that provincial governors retained almost supreme power within their spheres of control their status and the progress of their careers depended entirely on retaining the good faith and trust of the Emperor.[421] Moreover, the actual method by which the government operated, both at an imperial and provincial level appears to have been via a system of petitions and responses. This system frequently took the form of letters and face-to-face embassies and is demonstrated most clearly in the correspondence of Pliny the Younger, acting as the proconsul of the province of Bithynia, and Emperor Trajan between 111 and 112 AD.[422] This correspondence shows that Pliny frequently contacted Trajan for various reasons such as for advice on a course of action, a judgment on legal issues or a response to a petition from a third party.[423]

Consequently, Fuhrumann is presumably correct to argue that the Emperor tended to remain aloof of provincial matters unless problems were brought to his attention.[424] That this was the case is indicated by the sheer volume of correspondence which was presumably received by the Emperor and in which he seems to have been involved.[425] This would certainly have reached thousands of cases.[426] Thus, it was primarily through the various governors and officials who toured their provinces and oversaw specific assignments on behalf of the Emperor that imperial government and state requests were carried out.[427] Such a system, while effective, was, however, slow and logistically difficult as Millar and Corcoran have recognised.[428] This was due primarily to the distance between Rome and many of the provinces. However, this was further complicated by the fact that provincial governors, as part of their imperially mandated duties, were required to travel across their territories to hold court and to receive

[419] Paterson, 2013, p.121-122; 134-135; 151-155; Fuhrumann, 2011, p.181; Rowe, 2006, p.117; Millar, 2004, p.32; Cotton, 1984, p.245-266; Hadrill, 1982, p.32-48; Plin.*Ep*.10.1.
[420] Goodman, 1997, p.101-103; Fuhrumann, 2011, p.148-149; Millar, 1992, p.317.
[421] Paterson, 2007, p.121-122; 129; Fuhrumann, 2011, p.171; Jos.*BJ*.2.195.
[422] Millar, 1992, p.8-11; 228-240; Fuhrumann, 2011, p.148-149; Goodman, 1997, p.109; Corcoran, 2014, p.182; Plin.*Ep*.117; Dio Chrys.*Or*.40.13-15.
[423] Corcoran, 2014, p.185; Plin.*Ep*.10.19; 31; 57 74. Millar, 1992, p.317 has argued that the Emperor did not initiate correspondence and Corcoran, 2014, p.186 has argued that he did.
[424] Fuhrumann, 2011, p.148.
[425] Suet.*Div.Aug*.45; 88; *Vesp*.21; Plin.*Ep*.10; 60; 107; 48 Tact. *Ann*. 1.11.7; Dio.2.557; Mar. Aur.15.
[426] *P. Yale.* 1.61, lines 5-7 shows that the Prefect of Egypt received some 1,084 petitions in just two days.
[427] Paterson, 2013, p.143 suggests that for the Emperor having effective subordinates was the key for a functioning government to continue.
[428] Millar, 2004, p.24; Corcoran, 2014, p.203-204.

petitions.[429] This would have further increased the distance between governors and the Emperor. On the other hand, this was also true of the Emperors themselves who in some cases, such as Trajan, are renowned for spending large portions of their reign campaigning away from Rome.[430]

For Rome's government to function effectively therefore depended upon reliable long-distance communication.[431] This role, it has been suggested, was fulfilled by the *cursus publicus* which is believed to have been a state-organised system of messengers who utilised designated staging-posts situated throughout the Empire to deliver communiqués.[432] However, the existence of such a formal system has been debated, with Corcoran arguing that it did exist as a passage from Suetonius' *Life of the Divine Augustus* suggests.[433] In contrast, Millar argues that Suetonius' solitary reference is not enough evidence to support the proposition that such a large system existed.[434] Millar takes this view despite rightly acknowledging the necessity of long-distance messengers for effective Roman government. Instead, he suggests that this was facilitated by the ability of officials to requisition animals, men and guides to transport messages as well as the obligation of local communities to provide assistance.[435] Conversely, it is possible that Suetonius, in a similar trend to that found in the work of Strabo, is trying to emphasize the level of organisation which Augustus brought about compared to what had been in place before. Indeed, it has already been shown that a system of state organised messengers did exist in the Eastern Desert.[436] This makes it very feasible that a larger system of state messengers was used across the empire.

It has been seen that these messengers delivered reports, letters and vital necessities and so were an important instrument of state interaction.[437] It is not impossible therefore that Augustus could have utilised a similar system, to some degree in Italy. This is certainly what Suetonius passage indicates.[438] As a result, while this system was used across the Empire, it may have

[429] Aldo, 2006, p.180; Goodman, 1997, p.103; Fuhrumann, 2011, p.173; Millar, 2004, p.35; Plin.*Ep*.10; 29-32; 65-66; 72-73; 49-50; 68-71; 80-82; 96-97.
[430] Millar, 2004, p.26.
[431] Millar, 2004, p.29. Kolb, 2019, p.9 rightly notes that Rome's road network represented a tangible means of rule over their territory.
[432] Chrystal, 2018, p.195. There is something of a parallel to the *cursus publicus* to the so-called 'Royal Road' of the Achaemenids. On this see Dusinberre, 2003, p.3.
[433] Corcoran, 2014, p.201; Suet. *Div.Aug*.49.
[434] Millar, 2004, p.24.
[435] Millar, 2004, p.25.
[436] Cobb, 2018b, p.45; Bülow-Jacobsen, 2013, p.562; Strab.2.5.12; *O. Krok.*1-4; *O. Dios iv*.39.
[437] For more on this see Chapter III.
[438] Suet. *Div.Aug*.49.

been established on a province-by-province basis.[439] Regardless, geographical constraints continued to present a significant challenge for the involvement of the central government in regional affairs.[440] Such limitations, by necessity, resulted in Rome's government being slow and ponderous with some inquiries taking up to four months to receive an answer from the Emperor.[441] This would have placed an even greater emphasis on the role of governors and local officials. Moreover, aside from the desire to closely oversee the Eastern Desert and the Red Sea these practical limitations may also explain the number of officials that were assigned to the region.

The Prefect of Egypt

The position of the *praefectus Aegypti* (Prefect of Egypt), similarly to the province of Egypt itself, was unique compared to other senatorial and imperially appointed positions.[442] For one, the Prefect of Egypt was an equestrian rather than a senator and, moreover, he was the only non-senator permitted to command both legionary and auxiliary troops.[443] In practice however the Prefect of Egypt acted similarly to many other provincial governors and was tasked with managing construction, travelling to hold judicial courts and responding to petitions from within his province.[444] However, the Prefect of Egypt was also one of the few governors that was entrusted to oversee the collection of provincial taxes rather than this duty being fulfilled by a procurator.[445] Furthermore, his imperial *mandata* (mandate) included the vital task of ensuring the export of grain to Rome.[446] As a result of being tasked with overseeing the entire province the Prefect of Egypt was also closely involved in overseeing the affairs of the Eastern Desert, the Red Sea and, by extension, the Indian Ocean trade. An example, of this involvement, is shown by the campaign of Aelius Gallus in 26/25 BC.[447] Although the motives behind this action are unclear its scale cannot be doubted since Strabo (Gallus' companion) states that the forces that were mustered included 10,000 imperial troops (half of Egypt's

[439] Plin.*Ep*.10.46; 47 preserves one enquiry to Trajan concerning passes for messengers in Bithynia.
[440] Millar, 2004, p.41 notes that letters were constantly being exchanged and would travel across thousands of kilometres within the Empire.
[441] Corcoran, 2014, p.204; Petrus Patricius.frag.8.
[442] Derda, 2019, p.59; Goodman, 1997, p.107; Eck, 2019, p.191-192.
[443] Eck, 2012, p.191-192.
[444] Eck, 2019, p.189; 192; *P. Yale.* 1.61, lines 5-7 shows that the Prefect of Egypt received some 1,084 petitions in just two days.
[445] Derda, 2019, p.59; Eck, 2019, p.190.
[446] Derda, 2019, p.59.
[447] Strab.16.4.22; Aug.*Res*.5.26; Plin.*NH*.6.32.160; Jos. *AJ*.15.317; Dio.29.3-8.

garrison in the 1st century AD), 1,500 allied soldiers and over 200 ships.[448] On the other hand, Gallus' campaign seems to be the only one of this scale during the imperial period.[449]

Nevertheless, the Sikyat inscription shows that in 76/77 AD the Prefect of Egypt, Iulius Ursus, continued to be directly involved in the affairs of the Eastern Desert and the Red Sea.[450] However, it should be emphasized that this event took place during what was probably a routine visit to Berenike.[451] This visit was probably to attend to his judicial duties as he fulfilled his obligation to tour Egypt. Instead, it seems that in the century following Gallus' campaign the Prefect of Egypt's was primarily brought into contact with the Eastern Desert and Red Sea region by responding to petitions, farming out the *tetarte* from his seat in Alexandria and, as was seen in Chapter III organising transport for returning pepper ships.[452] This shows that the state's key focus in the region was indeed tax revenue from the Indian Ocean trade. Nevertheless, overseeing this area on a day-to-day basis was primarily in the hands of the *praefectus Montis Berenicidis*

The Prefect of Berenike

Based on the comments of Pliny the Elder, Maxfield proposes that the post of *praefectus Montis Berenicidis* (Prefect of Berenike) might have been based on an earlier Ptolemaic precedent.[453] Certainly, an official under this title is attested during the reign of Tiberius (14-37 AD) and the post of *eparchos* of Berenike was created by 11 AD.[454] The office of the Prefect of Berenike, as has been seen, seems to have had a distinctly military character as he commanded the *Ala Heracliana*, a unit that appears to have been based at Coptos and perhaps close to Berenike.[455] Moreover, an inscription from Coptos suggests that the Prefect of Berenike also commanded the *praesidia* garrisons along the Coptos to Berenike road.[456] On

[448] Speidel, 2015, p.97-99; Sidebotham, 1986, p.122-123; Pollard, 2006, p.210; Strab.16.4.22; Tac. *Ann.*4.5.
[449] Another smaller campaign in the region may have taken place under the leadership of Gaius Caesar (Augustus' son). On this see Sidebotham, 1986, p.130-135.
[450] Bagnall et al, 2001, p.326; 331-333.
[451] Bagnall et al, 2001, p.326.
[452] De Romanis, 2020, p.132; 300-302. It is possible that that the construction of the *praesidia* which included Sikyat was commissioned by the Prefect of Egypt in response to a request from the Prefect of Berenike. On this see Bagnall, et al, 2001, p.329-330.
[453] Maxfield, 2002, p.147; Plin.*NH*.37.32.108.
[454] Cobb, 2018b, p.46; 107; Cuvigny, 2006a, 302; *CIL X II* 29 = *ILS* 2698. Cuvigny, 2018, p.68; *SB X* 173 = *SEG XX* 670 = *I. Pan* 51.

[455] Sidebotham, 2011, p.86; Cobb, 2018b, p.107; *O. Did inv.*733.
[456] Cobb, 2018b, p.107; Bagnall et al, 2005, p.28-29.

the other hand, in earlier scholarship, Sidebotham, Young and Tomber have proposed that the role of the Prefect of Berenike became more civilian in nature by the reign of Hadrian (117-138 AD).[457] However, subsequent work by a team under the auspices of the IFAO has drawn attention to documents indicating the continuing military nature of this office until *c.*190 AD.[458] This was an important time of transition in the history of the Eastern Desert and the Red Sea as the rate of taxation on the Indian Ocean trade changed from the 25% *tetarte* to the 12.5% *octava* sometime between 174 and 227 AD.[459]

Despite the apparent independence allowed to the Prefect of Berenike, an inscription from Aphrodito demonstrates that he reported directly to the Prefect of Egypt.[460] Practically, the Prefect of Berenike seems to have carried out his office in a similar manner to that of other imperial appointees and provincial governors. While his main base of operations appears to have been Berenike communications from the *praesidia* and Coptos indicate that the Prefect would travel between these locations in a similar manner to a governor touring his province.[461] For Cobb, this degree of movement enabled the Prefect to easily communicate with both the ports of Berenike and Myos Hormos.[462] In addition to his military duties, the Prefect of Berenike was also responsible for appointing and coordinating the activities of lesser officials such as the well-manger and the *quintanensis* who collected taxes at the customs gates in the Red Sea ports.[463] Furthermore, the inscription indicating that the Prefect of Berenike oversaw the *praesidia* garrisons suggests that he would have also appointed the garrisons' commanders.[464] The Prefect of Berenike will have also overseen construction and maintenance in the region.[465] Finally, it is possible that the Prefect of Berenike also oversaw attempts to farm pearls in the Red Sea, at least during the early imperial period when this activity likely took place.[466]

[457] Sidebotham, 1986, p.102-103; Young, 2001, p.75; Tomber, 2013, p.115.
[458] Cuvigny, 2006a, p.338; *P. Hamburg* 7; *I Did. inv*.940; *P. BAS*.2.7-8.
[459] *Codex Justinianus* 4.65.7; Wilson, 2015, p.27-28.
[460] Sidebotham, 1986, p.67; Cobb, 2018b, p.106; *I. Pan*.68.
[461] Sidebotham, 2011, p.85-86 argues that the Prefect of Berenike was based in the port city. In contrast, see Pantalacci, 2018, p.13; De Romanis, 2020, p.306 who both argue that the Prefect of Berenike was based at Coptos.
[462] Maxfield, 2002, p.143-170; Cuvigny, 2006a, p.295-300; Cobb, 2018b, p.107; *O. Krok*.47.
[463] Sidebotham, 2011, p.110; Nappo and Zerbini, 2011, p.68-76; Nappo, 2017b, p.561; *O. Ber* 11; 36; 51.
[464] See Maxfield, 2003, p.163 for a discussion of the evidence relating to the ranks of military officers in the *praesidia*.
[465] Sidebotham, 2011, p.110.
[466] Sidebotham, 2011, p.86; McLaughlin, 2010, p.200 Pliny.*NH*.6.26.84; Statius.*Silvae*.3.3.89. For discussions on the possible existence of pearl fisheries in the Red Sea see Schörle, 2015, p.43-54; Schneider, 2016, p.131-137.

On the other hand, the degree to which the Prefect of Berenike oversaw the mines and quarries of the Eastern Desert deserves some attention and is discussed more extensively below. While Sidebotham and Maxfield suggest that the Prefect of Berenike did manage the mines and quarries Cuvigny has recently proposed that by the later 1st century AD this may not have been the case.[467] It is generally agreed that the Prefect of Berenike's authority extended over an administrative unit that spanned from the Red Sea coast to the beginning of the Coptos to Myos Hormos road.[468] This appears to have been the case, as the Coptos Tariff suggests, by *c*.90 AD at the latest.[469] On the other hand, Cuvigny points to *I. Pan* 51 which lists Publius Iuventius Rufus, the then Prefect of Berenice, as the *archimetallarches or 'commander-in-chief of mines'* in 11 AD.[470] However, this mention of the Prefect of Berenike predates the establishment of the major imperial quarries of Mons Claudianus and Mons Porphyrites both of which were founded later in the 1st century AD.[471]

Importantly, the Prefect of Berenike, Cuvigny observes, is never mentioned in the administrative documents recovered from these sites.[472] Indeed, this is ostensibly because, following the establishment of the imperial quarries, the administration of the mining region to the north of Coptos was reorganised.[473] This area, as receipts from these quarries suggest, appears to have been placed under the direct control of an imperial freedman holding the title of *procurator metallorum*.[474] Thus, it seems clear that while the Prefect of Berenike did temporarily manage the mines and quarries north of Coptos his authority seems to have been transferred to another official after the imperial quarries were established.[475] It is clear, therefore, that the Prefect of Berenike, was tasked with a multitude of crucial roles. These were related to maintenance and security in the Eastern Desert and the Red Sea. This facilitated the Indian Ocean trade and ensured the collection of subsequent revenue. This again indicates the degree of state oversight by officials. However, this was not limited to the Prefect of Berenike since he was not the only prefect in the region.

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[467] Maxfield, 2002, p.148-150; Sidebotham, 2011, p.86; Cuvigny, 2018, p.68-69.
[468] Maxfield, 2002, p.148; Cobb, 2018b, p.107.
[469] Cobb, 2018b, p.107; *OGIS* 674.
[470] Cuvigny, 2018, p.68; *I. Pan* 51.
[471] Maxfield, 2002, p.148; Sidebotham et al, 2008, p.72; 77. Pliny, *NH*. 36.55 mentions the discovery of valuable stones in the Eastern Desert during the reigns of Augustus and Tiberius.
[472] Cuvigny, 2018, p.68. This is significant because, as Adams, 2007, p.197 states, 9,000 documents have been recovered just from the site of Mons Claudianus although, yet, only a small percentage of these have been published. Tomber, 2013, p.113 states that a further 700 documents have been discovered at Mons Porphyrites.
[473] Cuvigny, 2018, p.68.
[474] Cuvigny, 2018, p.68-69; *O. Claud. III* 528; 587; *O. Claud. IV* 848; 850; *O. Dios. Inv*.514; *CDE* 77.
[475] See below.

The Prefect of the Herculian Sea and the Farasan Harbour

Situated close to the mouth of the Red Sea and 60 kilometres from the Arabian coast it has been seen that Rome maintained a military presence on the Farasan Islands for at least thirty years between *c.*114 and 144 AD.[476] It is also possible that Rome was active again on these islands by the 6th century AD.[477] The latter of these two inscriptions shows that this garrison was under the command of another prefect, the *praefectus of the Herculian sea and the Farasan harbour*.[478] While Speidel notes that the inscription does not spell out the prefect's area of responsibility or his range of duties he suggests that the responsibilities of the Farasan Prefect were similar to those of the Prefect of Berenike.[479] Indeed, as the Farasan Prefect's title suggests, he was responsible for overseeing the Herculian Sea and the Farasan Harbour.[480] Similarly to Berenike, it is possible that the Farasan harbour acted as the headquarters of the Prefect and was Rome's foremost military base within the Farasan island chain. On the other hand, McLaughlin notes that the Farasan inscription contains the only known reference to the Herculian Sea.[481]

Nevertheless, it seems reasonable to accept McLaughlin's subsequent premise that this area included at least the entrance to the Red Sea and the straits of the Bab-el-Mandeb. Moreover, overseeing the Bab-el-Mandeb, as McLaughlin also suggests, will have required the Farasan Prefect to supervise naval forces that were likely stationed on the islands.[482] The military nature of the Farasan prefecture is confirmed by the soldiers attested in the inscriptions as well as the existence of at least one Roman-era fortification on the island and several watchtowers.[483] As a result, it has been suggested by McLaughlin, Sidebotham and others that the Farasan garrison was tasked with several important roles. These may have included providing security, levying tolls and taxes, preventing contraband goods from entering the empire, hunting pirates and, perhaps, guarding local pearl fisheries.[484]

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[476] McLaughlin, 2010, p.80; Sidebotham, 2011, p.188; Speidel, 2015, p.89; Cobb, 2018b, p.118-119. *AE* 2004, 1643 = *AE* 2005, 1639 = *AE* 2007, 1659 (144 AD); *AE* 2005, 1640 = *AE* 2007, 1659 (114/120 AD).
[477] The *Martyrium sancti Arethae* 27–29 references 7 ships being sent from the Farasan islands to aid the Axumites against the Himyerites.
[478] *AE* 2004, 1643 = *AE* 2005, 1639 = *AE* 2007, 1659.
[479] Speidel, 2015, p.90-91.
[480] *AE* 2004, 1643 = *AE* 2005, 1639 = *AE* 2007, 1659.
[481] McLaughlin, 2010, p.80.
[482] McLaughlin, 2010, p.80.
[483] *AE* 2004, 1643 = *AE* 2005, 1639 = *AE* 2007, 1659 (144 AD); *AE* 2005, 1640 = *AE* 2007, 1659 (114/120 AD); de Procé, 2019.
[484] McLaughlin, 2010, p.80-81; 200; Sidebotham, 2011, p.188; Speidel, 2015, p.91-92; de Procé, 2019.

All of these suggestions are likely, although, as Speidel has rightly cautioned, the enforcement of customs zones and the eradication of piracy would have required substantially more resources than a moderate garrison on a single island.[485] Instead, both McLaughlin and Sidebotham rightly advise that several such bases would be necessary, although they acknowledge that these sites are yet to be found.[486] Nonetheless, clearly, the Farasan Prefect was an important position with responsibility for a sizable military force and important civilian duties such as managing the harbour. Furthermore, the Farasan Prefect feasibly organised the delivery of supplies on the islands both for outgoing and incoming merchant vessels and the military.[487] Lastly, while it is uncertain exactly who this prefect reported to it seems reasonable to suggest, based on the precedent of the Prefect of Berenike that the Farasan Prefect reported directly to the Prefect of Egypt in Alexandria.[488] Thus, it is clear that the state sought to project power and closely monitor affairs some 1,000 kilometres from Egypt's provincial border. However, the Farasan garrison was, as was shown previously, not the only state-controlled location which served as a base for Roman officials with a customs outpost attested at Leuke Kome in Nabataea.

The Customs Post at Leuke Kome

As has been seen the other overseas location which was associated with Rome's Indian Ocean trade and administratively connected to the Eastern Desert and the Red Sea was Leuke Kome, which the *Periplus* states, was the site of a customs post.[489] While the location of Leuke Kome is unknown, it was certainly in Arabia and, judging by the date of the *Periplus*, was active by the 1st century AD at the latest.[490] Moreover, the *Periplus* states that the customs post was manned by an official and a centurion.[491] However, as was recognised, scholarly debate has proliferated around whether this post was manned by either Roman or Nabataean officials.[492] Strabo makes it clear that at the time of Gallus' campaign Leuke Kome was a part of the

[485] Speidel, p.2015, p.92. On the size of this garrison see Chapter I.
[486] McLaughlin, 2010, p.81; Sidebotham, 2011, p.188.
[487] McLaughlin, 2010, p.80 suggests that the garrison was supplied by the Red Sea ports. On the logistics of supplies to the Red Sea see Chapter II.
[488] Speidel, 2015, p.90-91; *I. Pan* 51.
[489] *PME* 19.
[490] Nappo, 2015b, p.173; Casson, 1989, p.6-7. For a discussion on the possible location of Leuke Kome see Nappo, 2010, p.335-342.
[491] *PME* 19.
[492] Bowerstock, 1983, p.70-71; Casson, 1989, p.145 and De Romanis, 1996, p.193 argues that the post was manned by Nabataeans. In contrast, Young, 1997, p.268 argues that it must have been manned by Romans.

kingdom of Nabataea.[493] Based on this Bowerstock has argued and has been followed by Casson and De Romanis, that the customs post must have been manned by Nabateans since it would be unusual to have had a Roman garrison stationed in foreign territory.[494] Moreover, Bowerstock has pointed out that the Nabataean kingdom had by this time adopted both Greek and Latin terms for military officers.[495] In contrast, Young argues, for several reasons, that the Leuke Kome customs post must have been overseen by Roman officials and soldiers.[496] The first reason for this, he suggests, is that the *tetarte* was a uniquely Roman tax.[497]

The second and more convincing reason is that if the post was manned by Nabataean officials then by the time that merchants had reached Roman territory, they would have had to pay 50% of their goods to tax collectors. This suggestion is based on 25% being paid in Nabataean territory and another 25% being paid on reaching a Roman customs post. The closest of these to Leuke Kome is noted by Pliny the Elder as being at Gaza.[498] The third reason that Young suggests that Leuke Kome was manned by Roman officials is that Pliny the Elder does not specify that the tax levied in Gaza was the *tetarte*.[499] Young, therefore, points out that if the Nabataeans controlled Leuke Kome it would have meant that merchants had a tax-free means of importing Indian Ocean goods.[500] As a result, Young argues that to close this loophole, the officials at Leuke Kome must have been Roman and must have passed any revenue onto the Roman state.[501]

Sitting between these two interpretations Nappo sees Bowerstock's reasoning as sound. However, he rightly emphasizes that Rome did garrison areas outside of imperial territory.[502] Moreover, Nappo proposes that since the author of the *Periplus* appears to have been an Egyptian, then his rendering of the term for centurion could be a Greek translation of a Latin term rather than the Nabatean equivalent.[503] However, Nappo is reasonable to follow Sidebotham's argument that the ethnicity of the officials in question cannot be concretely proven.[504] Certainly, given the ambiguity of the terminology, the ethnicity of the individuals is

[493] Srab.16.4.23.
[494] Bowerstock, 1983, p.75; Casson, 1989, p.145 and De Romanis, 1996, p.193.
[495] Bowerstock, 1983, p.70-71; *CIS II* 217.
[496] Young, 1997, p.267-268.
[497] Young, 1997, p.267.
[498] Young, 1997, p.267; Plin.*NH*.12.32.
[499] Young, 1997, p.267; Plin.*NH*.12.32.
[500] Young, 1997, p.267.
[501] Young, 1997, p.268.
[502] Nappo, 2015b, p.172. McLaughlin, 2010, p.81 has suggested, based on *PME*.16; 23; 31 that the Farasan Islands were granted to the Romans as a gift. Moreover, he suggests that this was the case with Leuke Kome.
[503] Nappo, 2015b, p.172. on the ethnicity of the author of the *PME* see Casson, 1989, p.7-9.
[504] Nappo, 2015b, p.175; Sidebotham, 1986, p.105-106.

unclear despite the Egyptian origin of the author of the *Periplus*. On the other hand, while this is the safest view to adopt it is more likely to agree with Young, as was suggested in Chapter I, that the official and soldiers at Leuke Kome were Romans. Regardless, Nappo is right to highlight that knowing the origins of the Leuke Kome officials is, in practical terms, irrelevant since Rome would still have retained the customs revenue.[505] This is because even with Leuke Kome being under the control of Nabataea, as Strabo shows that it was, Rome was still capable of extracting tribute from a politically independent power.

This is shown in the case of the island of Jotabe which, following the shift of Rome's Indian Ocean trade towards the northern ports from the 3rd century AD, seems to have acted as a customs post for the collection of tax revenue.[506] Moreover, it is shown in a passage by Theophanes the Confessor that while the island belonged to an autonomous community they collected revenue and passed it onto the Roman Emperor.[507] Under such circumstances, military action would only be undertaken if revenue was lost or withheld.[508] This was likely the situation in Leuke Kome with the revenue potentially being handed over to the Prefect of Egypt (perhaps via the Prefect of Berenike) who, as suggested above, was responsible for ensuring the delivery of the *tetarte* to the *fiscus* in Rome. This could then be transported to locations such as the *horrea piperataria*: the state pepper warehouse in Rome.[509] This situation indicates the powerful degree of state oversight in the region that had apparently been in place since the time of Strabo's reference to Leuke Kome. This lasted until Trajan annexed Nabataea and subsequently transformed it into a province following the death of the last Nabataean King Rebbel II in 106 AD and was primarily intended, as Young suggests, to ensure the collection of tax revenue from the Indian Ocean trade.[510]

The Arabarchia and the Paralemptes

It has been established that the *tetarte(s)* was certainly the largest and most valuable tax that was levied on Rome's Indian Ocean trade.[511] The Coptos Tariff shows that this was delivered

[505] Nappo, 2015b, p.175.
[506] Nappo, 2015b, p.174.
[507] Theoph.*Chronogr*.*P*.141.1-11.
[508] Nappo, 2015a, p.169; 174.
[509] Evers, 2017, p.111; Cobb, 2018b, p.123; Dio.72.24.
[510] Nappo, 2015a, p.63-64.
[511] Evers, 2017; p.109; Cobb, 2018b, p.115. Evers, 2017, p.110 observes that the *tetarte* was possibly replaced by the *octava* sometime between 174 and 227 AD. See *Codex Justinianus*.4.65.7; Wilson, 2015, p.27-28.

to the imperial *fiscus* by the *arabarchs*.[512] These officials are also mentioned in the Muziris papyrus as collecting a smaller tax directly from the recently docked Hermapollon.[513] This was either a road-use duty or, as De Romanis has recently proposed, a series of surcharges on so-called 'sound' ivory pepper and *schidai* (off-cuts from the tusks of live elephants).[514] This group of officials appears to have been a consortium who together purchased the right to collect the *tetarte* from the Roman state and was led by a single individual who technically held the *arabarchia*.[515] Despite a long history of Roman tax-farming the office of the arabarchia (ἀραβάρχης) potentially had its origins under the Ptolemies. Indeed, the earliest known holder of the title during the Roman period was named Ptolemy who held the post in 2 AD.[516] Both Evers and De Romanis have suggested, probably correctly, that in contrast to other farmed taxes during the Republican and Imperial periods the cost of the *tetarte* contract was determined by the Prefect of Egypt. Evers has argued, moreover, that the activities of the *arabarchia* were overseen by the Prefect of Berenike.[517]

Beneath the *arabarchs*, indeed, De Romanis has convincingly argued that he was appointed by them, seems to have been the *Paralemptes* (receiver), a sort of operations manager in charge of overseeing the cataloguing of goods and the collection of customs duties on the Indian Ocean trade and, as has already been seen, preventing smuggling.[518] However, De Romanis has also convincingly shown that the various *paralemptai* that are attested at Berenike and Myos Hormos (except for Leuke Kome) were possibly just *grammateis* (secretaries) who operated on behalf of the appointed *paralemptes*. Instead, the *paralemptes* probably exercised his duties from one of the 'emporia' where the taxes were collected as opposed to one of the Red Sea ports where they were only catalogued and sealed.[519] While the Coptos Tariff confirms that the *tetarte* was collected via public tax-farming until at least until AD 90, Evers has proposed that this changed by the 2nd century AD. This suggestion is based on the discovery of a Hadrianic era (117-138 AD) inscription which indicates that the office of the *arabarchia* had been

[512] Cobb, 2018b, p.114; *OGIS* 674. That this was delivered to the *fiscus* is shown by Plin.*NH*.6.84.
[513] Cobb, 2018b, p.114; *P. Vindob.G.*40822, recto *col II*, lines 7-11.
[514] Young, 2001, p.66-67; De Romanis, 2020, p.299-300. On *schidai* see De Romanis, 2017, p.369-380; 2020, p.217-222.
[515] De Romanis, 2020, p.302; Evers, 2017, p.109; Burkhalter, 1999, p.44-45; 48-50; Rathbone, 2002, p.183; *P. Vindob.G.*40822, *Verso col I*, line 2.
[516] Evers, 2017, p.109; Burkhalter, 1999, p.50-51. no 1-2; 53. no 9; *Tempel V Dukke III* 47a-b.
[517] Evers, 2017, p.110; De Romanis, 2020, p.302.
[518] Cobb, 2018b, p.114; Ast and Bagnall, 2016, p.177; 178-183; De Romanis, 2020, p.p307-308; Cuvigny, 2005, p.15-16 citing Burkhalter; Cuvigny, 2014, p.172; 174 Cuvigny, 2005, p.59-62. *K*256; 312; *OGIS* 202; *I. Portes.*70
[519] De Romanis, 2020, p.304-308; Cuvigny, 2005, p.15-16 citing Burkhalter; Cuvigny, 2014, p.172; 174; Cobb, 2018b, p.114-115.

integrated into the civil service by Hadrian's death at the latest.[520] After this time, based on the inscription, Evers suggests, that the *arabarchia* was overseen by a procurator.[521] This was most plausibly an imperial freedman.[522] On the other hand, while De Romanis recognises that the *arabarchia* may have been 'privatised' for some time he cautions that this was presumably short and probably only covered the period in which Trajan's canal was constructed and inaugurated.[523] After this, he points to evidence that the *tetarte* was once again farmed publicly during the 2nd century AD.[524]

That De Romanis proposition is plausibly correct is supported by the fact that other taxes continued to be publicly farmed across Egypt and at sites of importance to Roman trade with the East such as Palmyra until at least 170 AD.[525] Nevertheless, that the *arabarchia* was transitioned, however briefly, to state control by the early 2nd century AD approximately during the peak of Rome's Indian Ocean trade by the end of the 1st century AD is significant.[526] While the Roman state seems to have primarily relied on tax farming (an approach commonly practised by ancient states) to reduce the need for a large administrative apparatus Tan rightly acknowledges that this could have caused large quantities of revenue to be absorbed by middlemen.[527] It appears, therefore, that with a period of exponential growth in commercial activity and potentially the development of an important infrastructural asset to support it in Trajan's renovation of the Nile canal the Roman state sought to briefly become directly involved in aspects such as taxation. This should be no surprise given the potentially vast sums of money involved.[528] Indeed, what this example perhaps more than any other shows is that the state sought to oversee the affairs of the Indian Ocean trade and would adapt pre-existing systems to do so. Such an action was, again, reactive and was taken in response to changing circumstances by the state to proactively ensure the collection of future tax revenue.

[520] Evers, 2017, p.110; Jördens, 2009, p.359. no 15; *AE* 1999. no 418; *OGIS* 674.
[521] Jördens, 2009, p.359. no 15; *AE* 1999. no 418.
[522] Jördens, 2009, p.359. no 15; *AE* 1999. no 418.
[523] De Romanis, 2015a, p.125, f.5 shows that the canal seems to have begun construction in 112 AD.
[524] De Romanis, 2020, p.302; *AE* 1999 *I. Eph.*3.627; 7.3056; *A* 1559.
[525] Evers, 2017, p.110; *inv X* 29; *X* 13. It should be remembered that as Sommer, 2017, p.123 notes Palmyra had a very high degree of autonomy despite technically being part of the Roman province of Syria.
[526] Tomber 2008, p.24; Cobb, 2015a, p.363-390.
[527] Tan, 2017, p.41.
[528] See the Introduction for a discussion of the revenue potential of the *tetarte* during the imperial period.

Managing the Quarries

It has been observed that with the establishment of Mons Claudianus and Mons Porphyrites in the 1st century AD the management of these locations appears to have been transferred from the authority of the Prefect of Berenike to that of an imperial procurator. This individual was, as *I. Pan* 21, *O. Claud. Inv* 4739 and 7737 suggest, probably an (ex-)slave in the service of the Emperor.[529] Moreover, as was also noted the discovery of receipts from several of the quarries has led Cuvigny to suggest that Mons Claudianus, Mons Porphyrites, Mons Ophiates and Triberiane belonged to a single administrative unit. In support of this view Hirt highlights two individuals who served as procurators one of whom, Ephadorites Sigerinos, is shown to have been managing both Mons Claudianus and Mons Porphyrites. Moreover, Hirt has sensibly suggested that the second official, Ulpius Himeras, who appears in the epigraphy in connection to Mons Claudianus should be identified with a *procurator* of the same name serving at Mons Ophiates in 152/3 AD.[530] Rightly, therefore, Hirt confers with Cuvigny that the quarries seem to have come to be under the direction of a single imperial procurator rather than the Prefect of Berenike. Given the expansion of quarrying, this opinion certainly seems reasonable since all quarries and mines in the empire technically belonged to and were managed by the imperial estate.[531]

Indeed, an ostracon from Mons Claudianus shows that on a day-to-day basis reports on the quarry's progress were referred to a legionary centurion prefect.[532] Moreover, it has been established that a centurion oversaw the site. This is shown by the fact that this centurion along with the decurio received the largest share of water.[533] To find legionary officers managing quarry sites is, it has been stated, not unusual and these can be found across the empire. This included the Eastern Desert with centurions also recorded at Mons Porphyrites and Mons Ophiates.[534] It has been suggested that the choice of centurions to command the quarries may have been due to their expertise in such operations and Hirt proposes that this was the case for Annius Rufus who may have obtained the relevant knowledge during his legion's posting in other provinces with active quarries.[535] For Maxfield, the centurions that were transferred

[529] Hirt, 2011, p.107-108; *I. Pan* 21; *O. Claud. Inv*.4739; 7737.
[530] Hirt, 2011, p.107-108; *I. Pan* 21; *O. Claud. Inv*.4739; 7737.
[531] Mattingly, 2006, p.291-292.
[532] *O.Claud.inv.*1538+2921.
[533] Hirt, 2011, p.168-169; Maxfield, 2003, p.163.
[534] Hirst, 2011, p.169; Maxfield, 2002, p.150-152; *I. Pan* 21; 22; 53.
[535] Hirt, 2011, p.170; 175; *I. Pan* 42.

potentially over great distances from their parent legions represent direct appointments by the Emperor.[536]

While this is certainly suggested by the ostraca Hirt has rightly observed that the provincial governor could equally have had a hand in requesting these transfers and Pliny the Younger implies this in his letters to Trajan during the 1st century AD.[537] Nonetheless, Pliny also shows in a request for a centurion to manage commercial traffic in the city of Juliopolis that the Emperor would often have to personally approve such a transfer.[538] Regardless, the chain of officials in charge of the quarries in the Eastern Desert by the late 1st century AD is confirmed by a copy of two letters from the *curatratores* of the *praesidium* at Mons Claudianus. One of these is to the quarry's centurion and the second is addressed to the procurator.[539] This delineates a structure which suggests that while the quarries were managed by centurions who, in turn, worked closely with the *curatores* of the nearby *praesidium* and were overseen by the procurator who then reported directly to the imperial household in Rome. Thus, this major administrative reformation is a second example of the state seeking to oversee not just the Indian Ocean trade but also the Eastern Desert. Similarly, these actions were intended to secure valuable resources.

The Role of Imperial Slaves and Freedmen

Imperial freedmen (former slaves who had been granted freedom) were considered members of the *familia caesaris*.[540] More importantly from an administrative perspective however freedmen, along with slaves, belonging to the imperial family were responsible for managing imperial property and finances.[541] Indeed Weaver has suggested that a strict hierarchy existed ranging from sub-clerical positions to clerical ones and finally to posts such as senior administrators. The latter positions, Weaver suggests, would have been fulfilled by imperial freedmen.[542] Indeed, the potential involvement of imperial slaves and freedmen has already been observed in the cases of the procurators of the Eastern Desert quarries and collecting the

[536] Maxfield, 2000, p.435.
[537] Hirt, 2011, p.172; Plin.*EP*.10. 41; 42; 61; 62.
[538] Plin.*EP*.10.77.
[539] Hirt, 2011, p.168.
[540] Paterson, 2013, p.143.
[541] Paterson, 2013, p.143.
[542] Weaver, 1972, p.227-267.

tetarte while it was not being publicly farmed. Nevertheless, imperial freedmen could certainly obtain immense power, influence and recognition in the service of the Emperor with Augustus granting his doctor the gold ring of an equestrian and Suetonius suggests that Claudius' freedmen, the favourite of which was Narcissus, could even determine the holders of military commands.[543] It should be no surprise, therefore, to find freedmen such as Ephadorites Sigerinos and Ulpius Himeras being granted responsibility for the major quarries of the Eastern Desert. On the other hand, Sidebotham and more recently Bowman has suggested that several individuals active in the Eastern Desert may be identified as imperial agents who were participating in the Indian Ocean trade on behalf of the imperial family.[544]

There is no doubt that this collection of references that come from the Nikanor Archive and the Berenike customs passes mention several 'slaves of Caesar.' These were connected both to Emperor Tiberius and, perhaps, even to Narcissus, Claudius' infamous freedman.[545] However, Cobb is right to argue that the evidence does not fully confirm if these agents were actively engaging in trade or simply the procurement of supplies.[546] Nonetheless, it is clear from seals discovered in Alexandria labelled as 'spices of Caesar' that the imperial family was involved in obtaining goods from the Indian Ocean.[547] However, this could just as easily have been the portion of the *tetarte* which Evers proposes was not converted into cash in Alexandria and was instead shipped to Rome for consumption directly by the imperial household.[548] As a result, while the involvement of the imperial family in the Indian Ocean trade cannot as of yet be confirmed this additional evidence does demonstrate the proclivity of imperial freedmen, their agents and imperial slaves in the Eastern Desert region. This further validates the supposition outlined above that imperial agents served as procurators and came to manage the imperial quarries. Furthermore, the presence of several imperial agents, alongside these state appointees of the imperial household shows the extent to which not only the provincial government but the imperial household was involved in overseeing the affairs of the region.

[543] Paterson, 2007, p.143; Dio.53.30.3; Suet. *Div.Claud*.29.
[544] Sidebotham, 1986, p.114; Bowman, 2010, p.106–107. Nappo and Zerbini, 2011, p. 65 argue that such a suggestion should not be ruled out completely.
[545] *O.Petr*.237–239,242,247; *O. Ber*.106; 184–188; 193.
[546] Cobb, 2018b, p.123-126.
[547] Cobb, 2018b, p.123; McLaughlin, 2014, p.193.
[548] Evers, 2017, p.111.

Conclusion

It has been shown throughout this chapter that numerous state officials and agents were appointed to oversee almost every aspect of activity related to the Eastern Desert, the Red Sea, and the Indian Ocean trade. This included everything from quarry output to sourcing potable water, providing security and, vitally, overseeing tax collection. This resulted in the creation of a complex network of officials that spanned from small island garrisons up to the Prefect of Egypt in Alexandria and, finally, to the Emperor in Rome. Moreover, while Cuvigny has been hesitant to suggest that administration in the region was divided into distinct two zones this appears to have been the case. This probably took place following the establishment of the imperial quarries in the 1st century AD. As a result, the Prefect of Berenike oversaw the ports, roads, *praesidia* and the collection of tax revenue from the Indian Ocean trade. In contrast, the *procurator metallorum* managed the quarries north of Coptos on behalf of the Prefect of Egypt and the Emperor. On the other hand, it has been observed that this situation was not initially the case. Formally, duties such as managing quarries were within the remit of the Prefect of Berenike and the collection of the *tetarte* was, at least at one point, privatised by the state. However, by the time of Hadrian's death and the peak of Rome's commerce in the Indian Ocean the state seems to have conducted a major reform of its administration in the region.[549] This course of action was likely a reactive effort motivated by the desire to ensure state supervision of the growing Indian Ocean trade and to proactively ensure the collection of future tax revenue.

[549] It was suggested to the author in a conversation with Dr Kyle Erickson that the division of officials in the way outlined above may also have been to prevent the chance of any one of them obtaining too much power and influence. It should be noted, however, that this conversation was in relation to the earlier Ptolemaic presence in the Red Sea.

Conclusion

> [The emperor Trajan] who, by his authority, advice, and loyalty has opened up roads, provided harbours, given routes to the land, let the sea into the shore, and extended the shore out to sea, and has mixed different peoples by trade to such an extent that whatever is produced anywhere seems to have originated among everyone.[550]

This thesis has sought to better understand the nature of the relationship between the Roman state and the Mediterranean trade in the Indian Ocean. While many scholars recognise that the state made significant and often proactive investments in infrastructure some, such as Young, have argued that the state was, in general, only involved reactively beyond monitoring merchants. Also, Young has suggested that all state involvement was motivated by a desire to collect the large amount of revenue that could be obtained by taxing Indian Ocean imports. However, it has been argued in this thesis that these two views are not mutually exclusive and that a more nuanced stance is needed. To that end it has been shown that by the early 2nd century AD Rome had committed potentially up to 20% of its military in Egypt to the Eastern Desert and the Red Sea for tasks related to the Indian Ocean trade. It has, moreover, been suggested that these troops had two primary duties. The first of these was to provide security to merchants and civilians both in the Eastern Desert and the Red Sea. This was done, principally by defending the *praesidia* and patrolling known hot spots in the Red Sea. The second duty was to ensure that an adequate supply of potable water was available and, perhaps, to control access to it. This was achieved through the close connection between the *praesidia* and wells of potable water, delivering this water via the postal service and providing a military escort for larger supply caravans. However, it has also been acknowledged that the military also played roles in preventing smuggling and conducting campaigns against the *barbaroi*. Finally, it has been argued that many state officials, as well as managing other activities, oversaw these tasks and ensured that they were performed effectively.

[550] Plin.*Pan*.29.2-3, trans Wilson and Bowman 2017.

The reason for this high level of state oversight and action in the Eastern Desert and the Red was, as Young rightly suggests, almost certainly to collect revenue from the Indian Ocean trade. On the other hand, the more nuanced position that has been advocated throughout this thesis has shown that while the activities that were undertaken by Rome's soldiers in the region were actions that were designed to proactively ensure the future collection of the *tetarte* these were likely introduced reactively. This is not to imply that such measures were centrally planned as part of a wider state policy. Instead, the basis of actions such as the deployment of troops and the use of fortified stations were likely introduced in accordance with earlier Ptolemaic precedent. The Roman state then seems to have gradually increased these precautions reactively in response to an increasingly hostile environment in the Eastern Desert and the Red Sea and the growth of the Indian Ocean trade itself. Indeed, that such measures generally appeared alongside these two developments at the end of the 1st century AD indicates that this was the case. What came to be a steadily implemented policy of proactively securing revenue then lasted at least until the decline of Rome's Indian Ocean trade in the 3rd century AD.[551] Nonetheless, to see the state responding in such a way represents a significant and more nuanced development in our understanding of the relationship between the Roman state and the Indian Ocean trade and moves beyond a traditional proactive versus reactive viewpoint. While this stance cannot be proved conclusively, and because it is not clear that such considered involvement in economic activity on the part of the state was universal this could have important ramifications for these questions. Certainly, therefore these issues deserve to be examined in future research and scholarship.

[551] Young, 2001, p.73-74; Nappo, 2007, p.237; McLaughlin, 2010, p.60.

Appendix I.

The Status of Egypt as a Province

Amongst the forty-four provinces that comprised the Roman Empire by the reign of Marcus Aurelius (161-180 AD) Egypt had held a special status since the conquest of Augustus.[552] The distinctly imperial nature of the province was established by Augustus' proscription that no senator was to enter the province without his express consent.[553] This special status, it has been suggested, was for serval reasons. The first of these was due to the role that Egypt played in supplying the grain on which the people of Rome depended.[554] This demand was substantial with estimates suggesting that 700,000 people could have required 70,000 *modii* of grain per month and 1 million inhabitants needed 60,000 tons of grain every four months.[555] Nevertheless, shortages in the grain supply were common.[556] This could significantly undermine the political stability of the Emperor in his capital.[557] Alongside this, the special status of Egypt has been attributed to the comparative wealth of the province to others throughout the Roman Empire.[558]

Indeed, McLaughlin has suggested, that Egypt had a much greater economic value than many of the other provinces and possibly provided as much as 600 million *sesterces* per year to the *fiscus* during the Roman period.[559] This McLaughlin suggests, was a result of Egypt's agricultural revenue and the additional income from taxing the Indian Ocean trade.[560] This combination potentially put the revenue of Egypt, perhaps as much as several, orders of magnitude above that of some other provinces at different points in time.[561] While Duncan-Jones has highlighted that both of the figures which McLaughlin would later use have rightly

[552] Eck, 2019, p.188; Ackeren, 2019, p.1; Derda, 2019, p.58.
[553] Dio.51.17.1.
[554] Derda, 2019, p.58; McLaughlin ,2014, p.21-25 suggests that Egypt supplied one-third of the grain which Rome needed.
[555] Tchernia, 2016, p.214; Jos. *BJ*. 2.383; 386. T
[556] Tchernia, 2016, p.208; Tac. *Ann*. 12. 43.2-4.
[557] Derda, 2019, p.58.
[558] McLaughlin, 2010, p.167; 2014, p.19-20. Adams, 2019, p.233 argues that, by the Roman period, Egypt had become one of the richest, most heavily populated, and urbanised regions of the empire.
[559] McLaughlin, 2010, p.167; 2014, p.19-20.
[560] McLaughlin, 2019, p.117-118.
[561] McLaughlin 2010, p.167-168; 2014, p.20; 2019, p.117-120.

been subjected to criticism it should not be doubted that Egypt possessed immense wealth.[562] This supposition is one that is strongly supported by sources such as Josephus.[563] Regardless, the perceived value of gems and precious metals obtained from the Eastern Desert would have provided an additional motive for a special degree of imperial interest in the province.[564] Finally, the addition of the rare and valuable stone produced by sites such as Mons Claudianus and Mons Porphyrites which were used in major imperial projects such as Hadrian's villa at Tibur provides yet another justification for the special status of Egypt.[565]

[562] Duncan-Jones, 1994, p.53; 254.
[563] Jos. *BJ*.2.16.4.
[564] Sidebotham et al, 2008, p.277.
[565] Sidebotham et al, 2008, p.74; 78; 82-83; Reddé, 2018, p.183.

Appendix II.

Rome's Military Deployment in the Eastern Desert and the Red Sea

Deployed	Evidence	Estimate
Praesidia	Remains/Rotas	780 men
Quarries	Inscription	60 men +
Ports	Literary/Remains	100 men +
Fleet	Literary/Ostraca	400 men +
Leuke Kome	Literary Sources	50-80 men
Farasan	Inscriptions	110 +
External Bases	Literary Sources	500 to 1,000 men
Total: 1,500 to 2,000 men		

Appendix III.

Rome's Military Deployment in Egypt

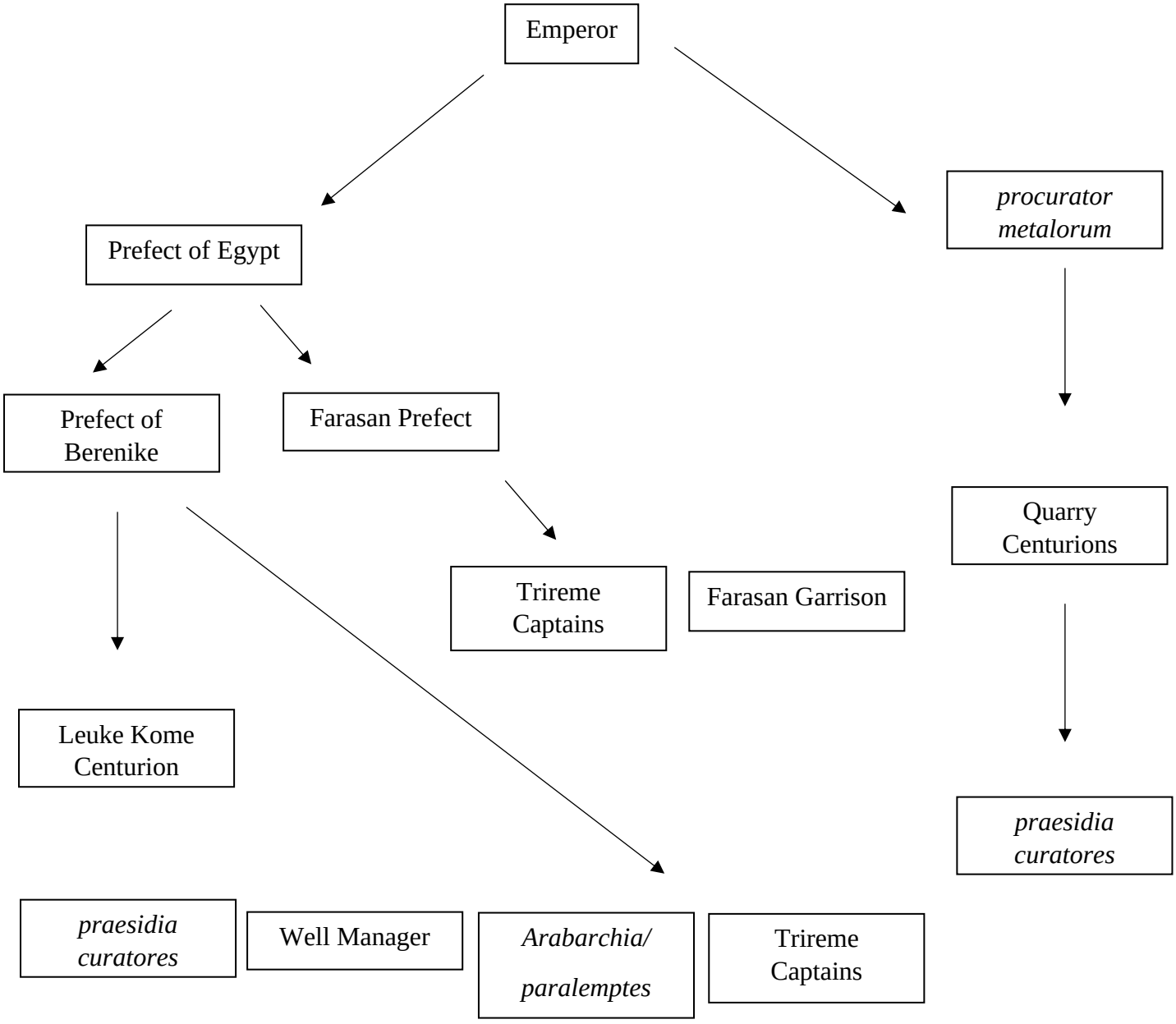
Century	Troops Deployed (auxilia and legionaries)	Evidence
Late 1st century BC to early 1st century AD	*c.*22,000 men	Strab.17.1.12
23 AD	*c.*16,000 men	Tac.*Ann*.4.5
120s AD	*c.*11-12,000 men	BGU I 140

*Table adapted from Fischer-Bovet and Sänger, 2019, p.172.

Appendix IV.

Eastern Desert and Red Sea Officials

(Post-Reform Structure, 1st Century AD)



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