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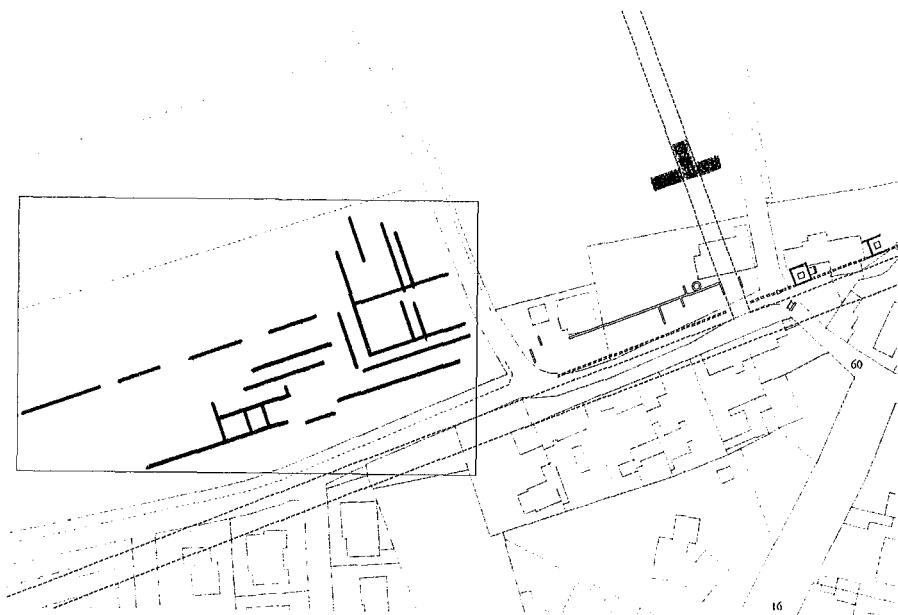


Fig. 14. Enclosed within the rectangle are extensions to the west of the necropolis partially excavated by G. Brusin in the 1940s.

A monumental necropolis revealed by Brusin²⁹ is still partly visible to the west of the town centre (fig. 4 in squares 5b-5c). Further tombs were recognized on the W side of this sector, and the photographs taken in 2003 allow us to identify its continuation to the west (fig. 14). In the new sector the precincts are arranged in at least three rows parallel to the course of the road. They are partly concealed by modern buildings.

Conclusions

Up to this point our research has been performed mainly on the aerial images. It needs to be confirmed and complemented with data acquired from other sources, such as geophysical prospection, laser scanning, and excavation. It is to be hoped that the collection of data on this GIS platform will also help to focus future excavations (always the most expensive and the most destructive solution) on those areas where there is the most to be gained.

maurizio.buora@uniud.it Dipt. di storia e tutela dei Beni Culturali, Università di Udine
vito.roberto@uniud.it Dipt. di Matematica e Informatica, Università di Udine

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²⁹ Brusin (supra n.3).

On the location of Leuke Kome

Dario Nappo

Roman harbours on the Red Sea are described in a number of literary sources, the most important of which are Strabo's *Geographia*, Pliny's *Naturalis Historia*, Ptolemy's *Geographia* and the anonymous *Periplus Maris Erythraei* (hereafter *Periplus*). Leuke Kome, Myos Hormos and Berenike were the key commercial hubs on the Red Sea in the 1st and 2nd c. A.D. for trade with India.¹ Myos Hormos and Berenike have been identified and investigated: Berenike was sited just south of the large peninsula of Ras Benas, while Quseir al-Qadim is generally regarded as the site of Myos Hormos (fig. 1).² The exact location of Leuke Kome, however, remains uncertain. Most scholars believe that it should be located in the area of modern Aynuna, c.5 km from the coast at the mouth of the Gulf of Aqaba;³ surveys of the area have revealed extensive architecture, including a tower and a necropolis.⁴ Although the evidence is meager, this identification is generally accepted. Nevertheless, a few scholars have suggested that Leuke Kome is located farther south. P.-L. Gatier and J.-F. Salles analysed some of the features of Leuke Kome described by the *Periplus* and cautiously suggested locating it at al-Wajh or possibly Qarna.⁵ H. Cuvigny has also suggested al-Wajh on the basis of the description provided by the *Periplus* and the site's geographical setting.⁶ Most recently, J. Hill has posited the identification of al-Wajh with Leuke Kome on the basis of Chinese texts.⁷

The first goal of this article is to explore in greater detail the hypothesis put forward by Gatier and Salles, Cuvigny, and Hill, and to demonstrate that the equation of Leuke Kome with al-Wajh is the best possible one. The second is to show how the location of Leuke Kome can be used to advance our understanding of the development of the Roman port system over time.

The location of Leuke Kome

The two main sources on Leuke Kome are Strabo and the *Periplus*.⁸ In Book 16, Strabo tells the story of Aelius Gallus' failed military expedition which aimed to conquer S Arabia.⁹

- 1 See Sidebotham 1986a; De Romanis 1996; Young 2001; Tomber 2008.
- 2 On Berenike and its location, see Sidebotham and Wendrich 1995, 1996, 1998, 1999, 2000, and 2007; Sidebotham 2002b. On the location of Myos Hormos, see below.
- 3 Kirwan 1979; Bowersock 1983, 48; Desanges 1984; Sidebotham 1986a, 124-26; Casson 1989, 144; Young 2001, 85-87; Tomber 2008, 68.
- 4 Ingraham *et al.* 1981, 76-78.
- 5 Gatier and Salles 1988, 186-87. Their view was accepted by De Romanis 1996.
- 6 Cuvigny 2003, 28-29.
- 7 See Hill's translation of the Weilue at <http://depts.washington.edu/silkroad/texts/weilue/weilue.html> (Section 16, viewed on Jan. 14, 2010).
- 8 For the text of the *Periplus*, see Casson 1989; for that of Strabo 16, see Biffi 2002.
- 9 Strab. 16.4.22-24. Although Gallus' expedition was a failure, it was viewed as a diplomatic success by Augustus, who mentioned it in his *Res Gestae* (26): *Meo iussu et auspicio ducti sunt duo exercitus eodem fere tempore in Aethiopiam et in Arabiam, quae appellatur Eudaemon, maximaeque hostium gentis utriusque copiae caesae sunt in acie et complura oppida capta. In Aethiopiam usque ad oppidum Nabata perventum est, cui proxima est Meroe. In Arabiam usque in fines Sabaeorum processit exercitus ad oppidum Mariba.* On this passage see Buschmann 1991; Jameson 1968; Luther 1999; Marek 1993; Potts 1994; Sidebotham 1986b; von Wissmann 1978.

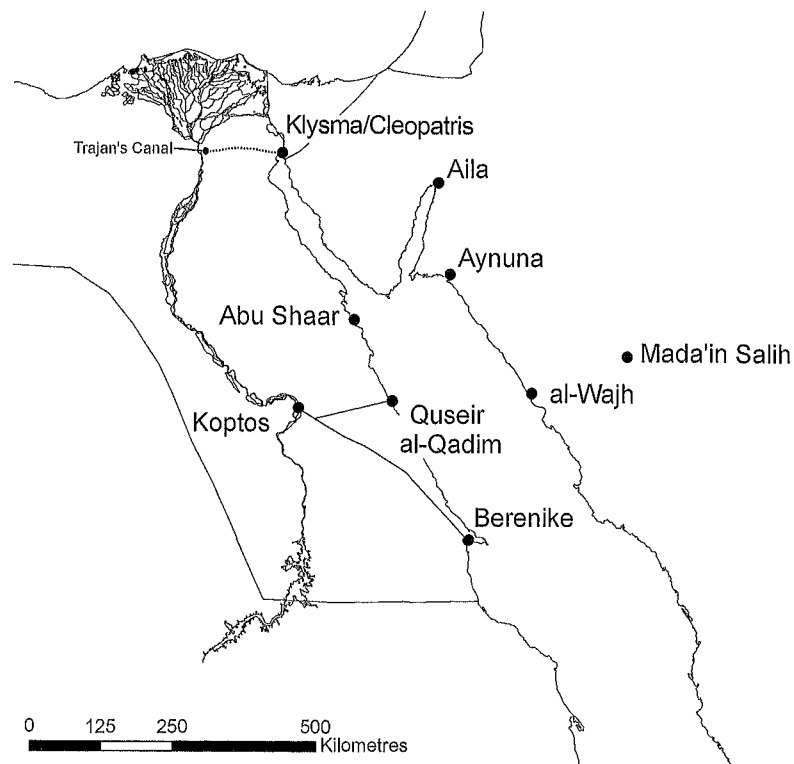


Fig. 1. Roman harbours on the Red Sea.

In 25 B.C. Gallus, with an army of ten thousand (one *legio* plus Nabataean and Jewish *auxiliares*), departed by sea from Cleopatra (mod. Suez). Gallus had earlier requisitioned 80 warships for transport, but later changed his mind and employed 120 large cargo ships.¹⁰ Strabo reports that the troops were afflicted with ailments of various kinds and that Gallus lost many of his ships and men due to storms and faulty navigation. For these reasons, 14 days later, Gallus decided to berth at Leuke Kome within the territory of the Nabataean kingdom, which at the time was allied with Rome. Gallus and his army remained at Leuke Kome all that summer and the following winter in order to give his men time to recover. In the spring of 24 B.C. he departed on a long desert march southwards. It took him 80 days to reach Negrana (mod. Najran), a town close to the incense-bearing lands. This was the southernmost point Gallus managed to reach. His army diminished by fever, he began the journey back to Egypt. According to Strabo, he departed not from Leuke Kome, but from Egra, another Nabataean settlement. From there, after a journey of 11 days, he reached Myos Hormos on the Egyptian coast. He then went overland to Koptos and eventually reached Alexandria.

Strabo calls Leuke Kome an *emporion*, a port of trade, and also makes it clear that it was a *hormos* (a natural harbour) rather than a port. Apparently the bay of Leuke Kome was large enough to accommodate a fleet as large as Gallus'. We may surmise that Leuke Kome was located along a fertile stretch of coast suitable for an encampment and able to provide sufficient food for Gallus' army for several months.

¹⁰ This mistake would prove to be crucial for the final outcome of the expedition. Due to the shallow coastal waters of the Red Sea, large cargo ships were not suitable for navigation. See De Romanis 1996, 19-21.

The information that the *Periplus* supplies on Leuke Kome is far more accurate than Strabo since it is a first-hand guide for merchants sailing the Red Sea. It reads as follows:¹¹

ἐκ δὲ τῶν εὐωνύμων Βερνίκης ἀπὸ Μυὸς ὁρμου δυσὶν ὁρμοῖς ἢ τρισὶν εἰς τὴν ἀνατολὴν διαπλεύσαντι τὸν παρακείμενον κόλπον ὁρμος ἐστὶν ἕτερος καὶ φρούριον, ὃ λέγεται Λευκὴ Κώμη, δι' ἧς ἐστὶν εἰς Πέτραν πρὸς Μαλίχαν, βασιλέα Ναβαταίων, ἀνάβασις. ἔχει δὲ ἔμποριον τινὰ καὶ αὐτὴ τὰξιν τοῖς ἀπὸ τῆς Ἀραβίας ἐξαρτιζομένοις εἰς αὐτὴν πλοίοις οὐ μεγάλοις. διὸ καὶ παραφυλακτικῆς χάριν καὶ εἰς αὐτὴν παραλήπτῃς τῆς τετάρτης τῶν εἰσφερομένων φορτίων καὶ ἑκατοντάρχης μετὰ στρατεύματος ἀποστέλλεται. μετὰ δὲ ταύτην εὐθέως ἐστὶν συναφῆς Ἀραβικὴ χώρα, κατὰ μῆκος ἐπὶ πολὺ παρατείνουσα τῇ Ἐρυθρᾷ θαλάσσει.

To the left of Berenice, after a voyage of two or three runs eastward from Myos Hormos past the gulf lying alongside, there is another harbour with a fort called Leuke Kome ["White Village"], through which there is a way inland up to Petra, to Malichus, king of the Nabataeans. This harbour also serves in a way the function of a port of trade for the craft, none large, that come to it loaded with freight from Arabia. For that reason, as a safeguard there is dispatched for duty in it a customs officer to deal with the (duty of a) fourth on incoming merchandise as well as a centurion with a detachment of soldiers. Immediately after this harbor begins the country of Arabia, extending lengthwise far down the Erythraean Sea.¹²

The *Periplus'* account has been studied several times in order to calculate the exact location of Leuke Kome and its rôle in the Nabataean or Roman fiscal administration.¹³ As L. Casson points out, we must infer that a journey of "two to three runs" would have been about 1,000 or 1,500 stadia, or 100 to 150 nautical miles (equivalent to between 185 and 278 km).¹⁴

The traditional identification of Leuke Kome with Aynuna does not fit the *Periplus'* description. Table 1 compares the details of the *Periplus* with Aynuna's actual geographical features:

TABLE 1
COMPARISON BETWEEN *PERIPLUS'* DESCRIPTION OF LEUKE KOME
AND AYNUNA'S GEOGRAPHICAL FEATURES

<i>Periplus' account</i>	<i>Geographic characteristics of Aynuna</i>
1. Leuke Kome lies to the left of Berenike (i.e., northwards) and eastwards from Myos Hormos.	Aynuna is not located eastwards from Myos Hormos, but NNE.
2. 2 or 3 days are required to travel from Myos Hormos to Leuke Kome (i.e., between 185 and 278 km).	The distance between Quseir al-Qadim and Aynuna is 240 km in a straight line, but this does not fit into the <i>Periplus'</i> description, as explained below.
3. Leuke Kome is next to a gulf.	Aynuna lies next to the Gulf of Aqaba.
4. Leuke Kome is on or near a boundary between the Nabataean kingdom and what the anonymous author calls Arabia.	It is uncertain whether Aynuna is at the southern limit of the Nabataean kingdom, since the precise extension of its southern border remains unknown. ¹⁵

¹¹ *Periplus* 19-20.

¹² For the translation, see Casson 1989, 61-63.

¹³ See Bowersock 1983, 70-71; Sidebotham 1986a, 106-7; Casson 1989, 145; De Romanis 1996, 193; Young 1997.

¹⁴ Casson 1989, 143.

¹⁵ The southern extension of the Nabataean kingdom has been matter of discussion for many scholars. See, e.g., Sartre 1981, 77-92.

Of the four comparanda, just one is applicable to Aynuna, one is uncertain, and two are not compatible. Thus the identification of Aynuna with Leuke Kome is unconvincing. It is useful to further analyse the first and the second points of Table 1.

The *Periplus* states that Leuke Kome lies eastwards from Myos Hormos. The words εἰς τὴν ἀνατολήν (eastwards) would suit both a location eastwards and north-eastwards from Myos Hormos. However, if we look at the relative location of Myos Hormos and Aynuna, we find that the latter is 18° NNE from Myos Hormos, so we would expect that the anonymous author would have said εἰς τὸν βορῆν “northwards”, rather than εἰς τὴν ἀνατολήν, “eastwards”.¹⁶

Point 2 is more significant. First, the actual distance between Quseir al-Qadim and Aynuna is about 130 nautical miles (240 km) as the crow flies, a distance which seems to fit the *Periplus*' description. But the crucial point is that sailing ships do not follow a straight line, and this is especially true in the Red Sea during the 1st c. A.D., when sailing from south to north was accomplished by sailing a zigzag path upwind. If we assume an average offset of 45° from the intended line of direction,¹⁷ then the actual distance covered by a ship going from Myos Hormos to Aynuna would be increased by roughly 40% beyond the straight-line distance, which works out at an overall actual distance of c.250 nautical miles (330 km). This is not compatible with the 100-150 nautical miles (185-278 km) attested by the *Periplus*. Furthermore, this is sailing against the wind, which is much slower than running downwind. In such conditions, the possibility of accomplishing the journey in two or three days becomes even more unrealistic.¹⁸

To the evidence in Table 1 we may add that the particular regimen of winds in the N part of the Red Sea would make Aynuna a very difficult port to reach for ships coming from the south. In the area around Aynuna the winds blow year round from north to south, making a voyage to the port from the south extremely difficult (see further below).

Despite these difficulties, the equation of Aynuna with Leuke Kome has been favoured by most scholars due to a lack of alternate excavated sites on the Arabian coast of the Red Sea, and because the correct identification of the site of Myos Hormos with Quseir al-Qadim is still relatively recent. Since the first half of the 19th c. Abu Shaar (mod. Deir Umm Dehis) was considered the most likely candidate for this port, whereas Quseir al-Qadim was believed to be Leukos Limen. Such a reconstruction was based largely on the information provided by Ptolemy, who placed Leukos Limen south of Myos Hormos, in the area of modern Quseir al-Qadim.¹⁹

16 For a similar argument, see Cuvigny 2003, 28.

17 Such a degree can be considered as average for this kind of upwind navigation: see the calculations provided by Seidman 1994, 198-99. Even an offset of 90° would be possible in particular conditions, depending on the strength of the winds (see Medas 2004, 191). For an empirical case study, see the experiments conducted by the Kyrenia II, a reconstruction of a merchant ship of the late 4th c. B.C. excavated off N Cyprus (Katzev 1989, 8-10; id. 1990, 254); in sea trials the ship managed to sail 50-60° off the wind.

18 It makes little sense to demonstrate that the reverse journey (from Aynuna to Myos Hormos) could have been completed in two or three days using the northern winds, for in fact the *Periplus* gives figures for the journey from Myos Hormos to Leuke Kome, not the reverse.

19 See Ptol., *Geog.* 4.5.14-15, for the complete list of the ports on the Red Sea and their coordinates. Cohen 2006, 308-45.

Beginning in 1987, five seasons of excavation at Abu Shaar ascertained its rôle in long-distance commerce,²⁰ but not as a port. S. E. Sidebotham uncovered a fort that was established in the early 4th c. and later modified as a Christian church in the late 4th or early 5th c., before the site was abandoned in or after the 6th c.²¹ Although the fort was sited to monitor international trade and patrol the area, its chronology does not relate to activity during the time of the *Periplus* and thus negates its identification as Myos Hormos.²²

In 1993, D. Peacock suggested that Quseir al-Qadim was the ancient site of Myos Hormos, basing his argument on comparisons of ancient descriptions of Myos Hormos with modern satellite images.²³ Later, in the Eastern Desert at al-Zerqa on the Coptos to Quseir al-Qadim road, several *ostraka* were found that pointed to Myos Hormos as the *terminus* of that road.²⁴ Excavations at the site between 1999 and 2003 have yielded written evidence that has helped bolster its identification, including two papyri that mention “Myos Hormos at the Red Sea”.²⁵ It is now clear that the erroneous location of Myos Hormos affected abilities to locate Leuke Kome too, since its identification with Aynuna appeared in connection with the identification of Abu Shaar as Myos Hormos. Indeed, L. Kirwan, the first scholar to postulate that Leuke Kome was located at Aynuna, used these correlations to reach his conclusion:

Taking a line approximately due east from Myos Hormos — and one can hardly expect absolute precision from the *Periplus* — would carry to the al-Muwaylih-Duba area. But ‘crossing the gulf which lies alongside’ presents a problem. This must mean passing across the entrance to the gulf, probably the Gulf of Aqaba rather than the Gulf of Suez because the crossing appears to occur towards the end of the voyage, as one nears the harbour of Leuke Kome. If this interpretation is correct, it entails a line from Myos Hormos somewhat north of east, and this calls for a search along the whole coast between Duba and the entrance to the Gulf of Aqaba.²⁶

Kirwan's reconstruction is not without problems, as he himself admitted. Starting from Abu Shaar, he could not find a suitable place on the Arabian coast for Leuke Kome.²⁷ In order to avoid the problem, he adjusted the account of the *Periplus* to the geography of N Arabia (“one can hardly expect absolute precision from the *Periplus*”). Since the area of Duba was not suitable for Leuke Kome, he searched the coast for a more convenient place and found it in Aynuna.²⁸ His reconstruction is based on a weak premise. The position of Myos Hormos at Quseir al-Qadim renders Aynuna an impossible option for Leuke Kome. It is impossible to rectify the geographical relationship between Aynuna and Quseir al-Qadim with the *Periplus*' account. Nonetheless, Kirwan's methodology was correct and

20 A gate inscription reads *ad usum mercatorum* (see Bagnall and Sheridan 1994a, 162-63; Sidebotham 1994, 141 and 158); one *ostrakon* reads † ἐγὼ Ἀνδρέας [/ ἰνδικοπλεύσ[της / ἦλθον ᾧδε .. [/ Πιᾶυν[ι.] ἰνδ(ικτίονος) ᾧ † [(see Bagnall and Sheridan 1994b, 112).

21 Sidebotham 1994, 133; Bagnall and Sheridan 1994a, 159-60; Sidebotham 1996.

22 Bagnall and Sheridan 1994a, 161.

23 Peacock 1993.

24 Bülow-Jacobsen, Cuvigny and Fournet 1994, 27-42; iid. 1998, 65-66; Cuvigny 2003 and 2005; Cohen 2006, 333. So far, 33 documents have been found, but only some are published.

25 van Rengen 2000, 51.

26 Kirwan 1979, 57.

27 Ibid. 59: “... Duba would satisfy none of the requirements for Leuke Kome: ample and protected anchorage; a sufficient breadth of fertile coastal plain to provide food supplies; water for men and camels; and proximity to the Wadi Ufal”.

28 Kirwan 1979, 59.

can be used again. Taking a line due east from Quseir al-Qadim, one arrives on the Arabian coast much farther south than Aynuna. In this area, opposite Myos Hormos, lies al-Wajh. This site was previously identified as Egra, the port from which Gallus departed, according to Strabo, on his way back to Alexandria. A. Musil was the first to do so.²⁹ However, the Egra to which Strabo referred is probably an inland town whose actual ancient name was Hegra.³⁰ It lies in the area of modern Mada'in Salih and has been only partially explored by archaeologists.³¹ Hegra was established as a major Nabataean military post in the late 1st c. B.C. It seems probable that an outpost of such a size, so far from the centre of the kingdom, must have been designed to protect valuable commodities entering the Nabataean kingdom by land from S Arabia. It probably also functioned as a southern frontier and customs post. Musil suggested that the settlement at al-Wajh was the port of al-Hegr, its maritime counterpart, and was in some way linked to the inland town:

It is true that al-Hegr lies not by the sea, but inland; but near this town Aelius Gallus left the trade route and branched off to the coast, upon which the port of al-Hegr was situated. It is possible and indeed probable that this harbour was also called al-Hegr, just as the port of Madjan was likewise known as Madjan, and it is perhaps identical with the modern harbour of al-Wegh [i.e., al-Wajh].³²

However, the notion that there was a port called Egra (or Hegra) at al-Wajh is contradicted by our sources. Strabo says that Gallus stopped at Egra on his way back to the Empire, and that from there he reached Myos Hormos after 11 days. Since the *Periplus* states that the distance between Myos Hormos and Leuke Kome was 2 or 3 days, one could infer that Egra was much farther south from Myos Hormos than Leuke Kome, because Gallus was coming northwards from S Arabia. Strabo describes Egra as situated within the Nabataean kingdom, but this is contradicted by the *Periplus*, which claims that Leuke Kome lies on the frontier of the Nabataean kingdom. The possibility that any Nabataean ports existed farther south than Leuke Kome is then ruled out. Moreover, al-Wajh is directly opposite Myos Hormos and is the closest port on the Arabian coast. If al-Wajh was Egra, Leuke Kome (no matter where it was located) would be farther from Myos Hormos than Egra. But this is not possible because the journey between Myos Hormos and Leuke Kome requires 2 or 3 days, whereas Strabo stipulates 11 days from Egra to Myos Hormos. The only way to make sense of such a scenario is to assume that Strabo has mistakenly reported what Aelius Gallus told him about the expedition.³³

I believe the evidence can be re-interpreted as follows. Strabo's Egra should be located at Mada'in Salih, where Gallus stopped during his withdrawal from southern Arabia.³⁴ Strabo's mistake was to confuse the city at which Gallus stopped with the port from which he later embarked. That port was clearly Leuke Kome, which is exactly where Gallus had previously left his fleet to await his return. Musil was right in believing that Gallus reached

²⁹ Musil 1926, 299-301; followed by Kirwan 1979.

³⁰ There is no correspondence between the name *Egra* provided by Strabo and the name *Hegra* as found in the inscriptions in Mada'in Salih. The equation *Egra = Hegra* seems reasonable enough (see below). The Loeb edition of Strabo reports the variants *Hygras* and *Negras*.

³¹ Bowsher 1986; Al-Talhi and Al-Daire 2005; Nehmé, Al-Talhi and Villeneuve 2008 and 2010.

³² Musil 1926, 299.

³³ On Strabo's use of Gallus as his source, see Biffi 2002, 14-22.

³⁴ There was no compelling reason for Aelius Gallus and his army to stick to the pirate-ridden coast on his return from Negrana. The safer and more convenient way was to follow the inland caravan route northwards through Mekka, Iathrib, Khaybar and Dedan.

Myos Hormos from al-Wajh, but he failed to recognise that al-Wajh is Leuke Kome itself. According to Strabo, it took Gallus 11 days to travel from Egra to Myos Hormos. Mada'in Salih is roughly 150 km from al-Wajh, which would be a 7- or 8-day march for the army, assuming an average march of 20 km per day.³⁵ If we add to this 2 or 3 days (which the *Periplus* states are necessary to sail from Leuke Kome to Myos Hormos), and perhaps 1 day of preparation for the departure, the entire journey would have lasted between 10 and 12 days, which is perfectly compatible with Strabo's statement. His mistake was to assume that Egra was a seaport, whereas it was an *emporion* in the desert. Correcting this mistake, we can then explain how the equation of al-Wajh with Leuke Kome suits the accounts of Strabo and the *Periplus*. I begin by showing that the distances Strabo reports are compatible with al-Wajh.

TABLE 2
COMPARISON BETWEEN THE DISTANCES PROVIDED BY STRABO
AND THE LOCATIONS SUGGESTED IN THIS PAPER

<i>Strabo's account</i>	<i>Distances</i>
80 days, Leuke Kome to Negrana*	c.1600 km from al-Wajh to Najran
51 days, Negrana to Egra*	c.1100 km from Najran to Mada'in Salih
15 days, Cleopatra to Leuke Kome*	c.600 km from Suez to al-Wajh
* days of march + days of sailing	

The distance between Najran and al-Wajh is c.1600 km, whereas the distance between Negrana and al-Wajh is c.1100 km; Strabo reports that it takes 51 days to walk this latter route.³⁶ Furthermore, Gallus' 15-day voyage from Cleopatra to Leuke Kome is more reasonable if Leuke Kome is located at al-Wajh than at Aynuna or anywhere else north of al-Wajh.³⁷

In terms of its physical configuration, al-Wajh easily fits the description of Leuke Kome. The settlement lies on the edge of a large plain bisected by the broad and fertile Wadi Hamd, a suitable place for Gallus' army to rest. The sheltered waters of the sizeable bay (c.25 ha in area) could easily have accommodated a large fleet at anchor.³⁸ Indeed, what appear to be ancient structures, including a submerged mole, line the S side of the bay.

The last step is to check the viability of al-Wajh as a candidate for Leuke Kome against the description of the most accurate of our sources, the *Periplus* (Table 3).

The correspondences are precise in every respect, and we may conclude that the correct location of Leuke Kome is al-Wajh. With regard to point 2, the straight-line distance between Myos Hormos and al-Wajh is 108 nautical miles (175 km). Again, sailing ships

³⁵ Vegetius (1.27) claims that the average rate for an *antiqua legio* was 30 km per day. Gichon (1981, 59-60) argues that Gallus' army marched a maximum of 25 km per day. Goldsworthy (1996, 109-10) postulates that a Roman *legio*, even while marching on good terrain, could cover no more than 28-32 km per day; such an estimate would be reduced drastically if they were forced to cover desert terrain.

³⁶ Strab. 16.4.24. In both cases, if we consider an average of c.20 km per day, the distances are compatible.

³⁷ In this case it is difficult to estimate the average distance covered per day, particularly as the voyage was difficult and the fleet encountered numerous problems due to faulty navigation.

³⁸ For a general discussion on the sizes of ports in the Roman world and the information one might infer from them, see Schörle forthcoming.

did not travel in a straight line, but this distance is perfectly compatible with the *Periplus* within the parameters of Red Sea navigation.

TABLE 3
COMPARISON BETWEEN THE *PERIPLUS*' DESCRIPTION
AND FEATURES OF AYNUNA AND AL-WAJH

<i>Periplus' account</i>	<i>Aynuna</i>	<i>al-Wajh</i>
1. Leuke Kome lies to the left of Berenike (i.e., northwards), and eastwards from Myos Hormos.	Aynuna is not located eastwards from Myos Hormos, but northward.	Al-Wajh is located precisely eastwards of Quseir al-Qadim.
2. 2 or 3 days are required to travel from Myos Hormos to Leuke Kome (i.e., between 185 and 278 km).	The distance between Myos Hormos and Aynuna is more than 2 or 3 days of sailing.	Al-Wajh is no more than 2 or 3 days of sailing from Quseir al-Qadim.
3. Leuke Kome is next to a gulf.	Aynuna lies next to the Gulf of Aqaba.	Al-Wajh lies close to a gulf.
4. Leuke Kome is on or near a boundary between the Nabataean kingdom and what the anonymous author calls Arabia.	It is uncertain whether Aynuna was on the S border of the Nabataean kingdom, since the precise extension of its southern border remains unclear.	Al-Wajh may lie in a possible "border" area, as it lies on the same latitude as Mada'in Salih (26° 48' 0" N; al-Wajh: 26° 13' 60" N), which was the southernmost Nabataean outpost in the Arabian Desert.

On point 4, we may draw some inferences regarding Leuke Kome's rôle in the economy of the area. The *Periplus* says that the port was a customs point. Its link to Hegra suggests the existence of a customs area in the south of the Nabataean kingdom (and later in the *provincia Arabia*), one that operated through two main gates: an inland gate, which controlled caravans coming from the desert; and a coastal gate, controlling cargoes coming from the Red Sea. This suggests a well-organised system, perhaps established by the Nabataeans and inherited and improved by the Romans (a *centurio* is attested at Leuke Kome).³⁹

Leuke Kome and the Red Sea's port system

Resolving the location of Leuke Kome permits us to understand more fully the economic dynamics operating in the Red Sea between the 1st c. B.C. and the 2nd c. A.D., and to estimate more accurately the relative importance of settlements in the region. During the 1st c. A.D. two of the Red Sea's main ports, Myos Hormos and Leuke Kome, lay at approximately the same latitude on opposite coasts; a third, Berenike, lay farther south. All of them are said to have been in contact with India. According to the Elder Pliny, Berenike was the main hub from which ships going to S India would depart:⁴⁰

navigare incipiunt aestate media ante canis ortum aut ab exortu protinus veniuntque tricesimo circiter die Ocelim Arabiae aut Canen turiferae regionis. est et tertius portus qui vocatur Muza, quem Indica navigatio non petit, nec nisi turis odorumque Arabicorum mercatores. intus oppidum, regia eius, appellatur Sapphar, aliudque Save. Indos autem petentibus utilissimum est ab Oceli egredi; inde vento hippalo navigant diebus XL ad primum emporium Indiae Muzirim.

³⁹ *Periplus* 19: ἑκατοντάρχης μετὰ στρατεύματος.

⁴⁰ Plin., *NH* 6.104, transl. H. Rackham (Loeb edn. 1942) 417-18.

[sc. From Berenike] Passengers generally set sail at midsummer, before the rising of the Dog-star, or else immediately after, and in about 30 days arrive at Ocelis in Arabia, or else at Cane, in the region which bears frankincense. There is also a third port of Arabia, Muza by name; it is not, however, used by persons on their passage to India, as only those touch at it who deal in incense and the perfumes of Arabia. More in the interior there is a city; the residence of the king there is called Sapphar, and there is another city known by the name of Save. To those who are bound for India, Ocelis is the best place for embarkation. If the wind, called Hippalus, happens to be blowing, it is possible to arrive in 40 days at the nearest mart of India, Muziris by name.

The region in India reached by such ships was called Limyrikê. Only big ships could manage such a voyage, as attested by the *Periplus*, because it involved a long passage across open ocean using the monsoon winds:⁴¹

πλεῖ δὲ εἰς τὰ ἐμπόρια ταῦτα μέ<γ>ιστα⁴² πλοῖα διὰ τὸν ὄγκον καὶ τὸ πλῆθος τοῦ πιπέρεως καὶ τοῦ μαλαβάθρου.

The biggest ships in these ports of trade carry full loads because of the volume and quantity of pepper and malabathron.

The success of Berenike is easily understandable in light of the geographical and meteorological characteristics of the Red Sea. The regimen of the winds in this sea is very peculiar: at latitudes south of 20° N, southerly winds blow from May to September, while the rest of the year they are northerly; at latitudes north of 20° N, winds blow from north all year long. Therefore, sailing northwards in the northern gulfs of the Red Sea was difficult for square-sailed vessels, a condition compounded by the generally shallower coastal waters in this area.⁴³ Berenike was favoured by its geographical position at the southernmost point on the Egyptian coast, not far from the latitude that marked a change in the wind regimen. This also explains why, during the Ptolemaic age, the heavy ἐλεφαντηγοί, ships transporting elephants from Africa to Egypt, moored at Berenike;⁴⁴ it would have been difficult for ships of that tonnage to travel farther north to Myos Hormos.⁴⁵

If Berenike were the chief hub for direct trade with S India, what rôle did ports like Myos Hormos and Leuke Kome serve? According to the *Periplus*, Leuke Kome was the northern terminus of a maritime route running from north to south in the Red Sea. Numerous ships reached Leuke Kome each year, but none of them was large (πλοίοις οὐ μέγалоις). This, however, does not necessarily mean that Leuke Kome played a minor rôle in the economy of the region. The *Periplus*, after all, calls Leuke Kome an *emporion*, a term never used by that author for Berenike or Myos Hormos. This is a crucial point: despite the smaller size of ships that made for Leuke Kome, it was considered an important port and the volume of trade passing through it was large.

The apparent contradiction between the size of the ships and the volume of trade can be resolved by reviewing the geographical characteristics of the Red Sea. Leuke Kome lay

⁴¹ *Periplus* 56, transl. L. Casson 1989, 85; on the size of cargo ships, see Pomey and Tchernia 1978; Casson 1990, 194.

⁴² The codex uses μεστὰ, but I accept the emendment suggested by De Romanis 1996, 178.

⁴³ For a complete description of the characteristics of the Red Sea and of the regimen of the winds, see Strab. 17.1.45. See also Sidebotham 1986a, 51-52; De Romanis 1996, 19-28; Whitewright 2007.

⁴⁴ Strab. 16.4.4.

⁴⁵ During the Ptolemaic period, Berenike experienced a period of decline, beginning as soon as the import of elephants from Africa had ceased under Ptolemy V in c.205-180 B.C. (see Sidebotham 1986a, 4).

firmly above 20° N in an area of shallow water. As northerly winds dominate year round, ships were forced to sail close to wind in order to reach this port from the south. The only way to make this voyage easier and safer was to use numerous ships of relatively smaller size. We can then postulate a parallel situation at Myos Hormos, located at approximately the same latitude. From our sources we understand that Myos Hormos was used as a terminal for trade both within the Red Sea and with N India by way of cabotage.⁴⁶ It follows, then, that during the 1st c. A.D. large ships from Berenike capable of navigating the open ocean undertook direct voyages to S India. Myos Hormos and Leuke Kome filled a different rôle: ships working from there traded within the Red Sea or (in the case of Myos Hormos) with N India. It is also possible that goods brought from S India were transhipped through Berenike before arriving at Myos Hormos in smaller hulls, whence they were conveyed to Koptos and on to Alexandria.⁴⁷

I am not suggesting that such an organisation was in effect from the moment the Romans conquered Egypt, but this pattern does appear to have been operative during the 1st and 2nd c. A.D. A fluid situation is reflected in excavations conducted along the Myos Hormos/Nile and Berenike/Nile routes, as well as at the two ports themselves. There is no obvious difference in the material from the two sites that would suggest alternate sources (e.g., N India and S India) for the items traded there.⁴⁸ On the other hand, it is reasonably clear that after an initial commercial 'boom', which lasted until the middle of the 1st c. A.D., the volume of trade passing through Myos Hormos began to diminish, to Berenike's advantage.⁴⁹ One possible reason might be that ports like Myos Hormos and Leuke Kome represented a 'hybrid solution': while Berenike was the only suitable port for big ships coming from the south, Myos Hormos and Leuke Kome were not the best ports even for smaller ships coming from that direction. Instead, the crews of smaller ships coming to the Red Sea would have preferred to moor at the northernmost point (either Klysma or Aila) in order to avoid a long transit of goods through the desert. But winds complicated the matter, and there was a lack of infrastructure that could have connected the northern ports on the Red Sea with the hinterland and facilitated the conveyance of a large quantity of merchandise coming from the East. Myos Hormos and Leuke Kome were closer to the main *emporía* of their respective regions by comparison with Berenike, and this resulted in shorter journeys through the desert: the length of the land route between Myos Hormos and Coptos is 174 km,⁵⁰ while that between Coptos and Berenike is 392 km.⁵¹

This reconstruction of the Red Sea port system may also provide the key to understanding developments during late antiquity. At least from the 3rd c. A.D. the decline of Myos Hormos was so dire that the Romans gradually abandoned the site.⁵² Explanations for its nadir range from the 3rd-c. crisis, to attacks of the Blemmyes, to problems connected with the silting of the port.⁵³ But the crisis and the attacks affected Berenike as well; one might expect that Berenike's more peripheral location and consequent difficulty with regional control and protection would have caused its abandonment. Nevertheless, although a

46 De Romanis 1996, 127-37.

47 As suggested, with strong arguments, by Whitewright 2007, 84-86.

48 As summarised by Tomber 2008, 83-87.

49 For Myos Hormos, see Cuvigny 2003; for Berenike, see Sidebotham 2002a.

50 Brun 2002, 395-414.

51 Sidebotham 2002a, 415-38.

52 Cuvigny 2003, 201-3.

53 Whitcomb 1996, 758; Young 2001, 125-30; Cuvigny, *ibid.*

period of decline occurred during the 3rd c. A.D., Berenike recovered its rôle as an international entrepôt between the 4th and 6th c.⁵⁴ This suggests that the crisis that occurred in the region was not irreversible,⁵⁵ and that the reason for the decline of Myos Hormos lies elsewhere.

I suggest that the reason lies in the nature of the system itself during the first two centuries A.D. Something occurred that made the 'hybrid' positions of Myos Hormos and Leuke Kome weaker than before, effectively pushing these two ports out of the system. The 3rd-c. crisis accelerated the change, but did not cause it. It is more likely that the change started in the 2nd c. A.D. when two public works projects transformed the situation in the area of the northern Red Sea. Under Trajan a road, the *via Nova Traiana*, was built, which served as a link between the port of Aila (mod. Aqaba) and Syria.⁵⁶ He also opened (or re-opened) the canal linking the Nile to Klysma (close to mod. Suez).⁵⁷ These projects broke the isolation of the northern ports of the Red Sea, making them more suitable for trade.⁵⁸ After the 3rd-c. crisis, the *emporía* at Aila and Klysma took over the rôle of Myos Hormos and Leuke Kome for merchant ships coming from the southern Red Sea.⁵⁹ The infrastructure developed under Trajan made the 'hybrid solution' an inconvenient one.

Another factor that probably fostered this process was a partial change in commercial routes in the Red Sea and across the Indian Ocean in the 3rd and 4th c. As several scholars have pointed out, during and immediately after the crisis of the 3rd c. the rôle of Aksumite and Arab middlemen in managing the commerce with India seems to have greatly increased.⁶⁰ This would have led to a contraction in the volume of direct trade between the Roman empire and India. Roman traders would now find it more convenient to sail to *emporía* such as Adulis in the Aksumite Kingdom and there buy Indian goods imported by local traders. Although the influence that these middlemen had may be overestimated, sources attest to a well-established route linking the empire with such large *emporía* as Adulis.⁶¹ With a reliance on shipping confined to the Red Sea, the convenience of using northern ports such as Klysma and Aila became even greater.

54 Sidebotham 2002b.

55 See the general discussion on the impact of these 'invasions' of the area in Fournet 2002 and Rathbone 2002.

56 Pekáry 1968, 140-42; Isaac 1992, 120.

57 Trajan was not the first ruler to engage in building a canal in this area. It was attempted by the pharaoh Necho, by Darius I and by Ptolemy II, as attested in Herodotus (2.158) and Diodorus (1.33.8-12). On the canal, see Faville 1902-3, 66-75; Calderini 1920, 43-44; Bourdon 1925; Posener 1938; Sijpesteijn 1963; Oertel 1964; De Romanis 1996, 71-95; Aubert 2004.

58 The rôle of the canal in fostering trade in the area has been questioned by scholars. Although some believe that the canal could have been used by ships from Alexandria to reach Klysma and the Red Sea (see, e.g., Young 2001, 75-79, with bibliography), problems with this hypothesis have been raised by Mayerson (1996, 121), Aubert (2004), Adams (2007, 35) and Cooper (2009). As far as this paper is concerned, it makes little difference whether the canal was used by ships or small boats. Whichever the case, Trajan's canal linked Klysma with the Nile and opened up a route that was quite difficult to traverse before its construction. Such a route made it possible to connect the port on the Red Sea to Alexandria.

59 On Aila, see the evidence now available from the excavations led by S. T. Parker at Aqaba over the last 15 years: *id.* 1996, 1998, 2000, 2002, 2003 and 2009. On Klysma, see Petr. Diac., *Liber de locis sanctis* (CCSL vol. 175, 101); Bruyère 1966; Mayerson 1996; Ward 2007; Nappo 2009, 71-73.

60 Munro-Hay 1996; Whitehouse 1996; Nappo, *ibid.*

61 Cosmas Indicopleustes 2.54.6.

This suggests that the transport system operating in the Red Sea region was not monolithic but experienced several readjustments, depending on changes in routes of trade, but also on the influence of the imperial infrastructure. Identifying the correct location of Leuke Kome is crucial for developing a more complete picture of Red Sea trade from the 1st c. A.D. to late antiquity.

dario.nappo@classics.ox.ac.uk

Oxford Roman Economy Project, Oxford University

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The building inscription from the fort at Udruh and Aelius Flavianus, tetrarchic *praeses* of *Palaestina*

Caillan Davenport

In *JRA* 21 (2008), D. Kennedy and H. Falahat published an important new inscription from Udruh in Jordan.¹ It provides the first official confirmation that *legio VI Ferrata* was stationed at Udruh during the 'first tetrarchy' (A.D. 293-305) after its transfer from Caparcotna. The text also records the names of three imperial officials: a *dux*, Aurelius Heraclides, *vir perfectissimus*; the provincial *praeses*, Aelius Flavianus, *vir clarissimus*; and the legionary prefect, Aurelius Mucianus:

Restitutoribus urbis² terrarum, fundatoribus ubique / pacem, domatoribus universarum gentium barbarorum, / Imp(eratoribus) Caes(aribus) G(aio) Aur(elio) Val(erio) Diocletiano [[et M(arco) Aur(elio) Val(erio) Maximiano]] p(iis) f(elicibus) invict(is) Aug(ustis) et / Fl(avio) Val(erio) Constantio et Gal(erio) Val(erio) Maximiano fortiss(imis) ac nobiliss(imis) Caes(aribus) / Kastr(a) (sic) leg(ionis) VI Ferr(atae) f(idelis) c(onstantis) ex fundamentis / restituta insistentibus Aur(elio) Heraclida v(iro) p(erfectissimo) duci (sic) et / Ael(io) Flaviano v(iro) c(larissimo) praeside provinciae curante / Aure(lio) Muciano praef[ecto] eiusdem legeonis (sic)

Kennedy and Falahat provided a thorough commentary on the inscription and its implications for the military history of the region. The object of this note is to re-evaluate the position of the senatorial governor Aelius Flavianus in light of this new evidence by placing his career in the socio-political context of the tetrarchic period.

The career of Aelius Flavianus

Kennedy and Falahat identified the Aelius Flavianus in the new inscription with the Flavianus recorded by Eusebius as governor of *Palaestina* in 303.³ Flavianus had left office by 304, when he was replaced by Urbanus.⁴ This suggests that the new inscription should be dated c.303, before the change of governor. However, Kennedy and Falahat did not notice an inscription from Petra, also dating to the reign of Diocletian, which attests a *vir clarissimus* by the name of Aelius Flavianus as *praeses*.⁵ My first suggestion is that the Flavianus of the Udruh inscription and the Flavianus of the Petra inscription are one and the same man. The Petra inscription reads:

Excelsa pietate / maxim(a) virtute p(atrici)? p(iissimo)?⁶ f(ecit)? / Imp(eratori) Caes(ari) C(aio) Aur(elio) / Val(erio) Diocletiano p(i)o fel(ici) invicto Aug(usto) / Ael(ius) Flavianu(s) v(ir) c(larissimus) / pr(aeses) p[ro]v(inciae)

¹ Kennedy and Falahat 2008.

² The text of the inscription reads *urbis*, but *orbis* was surely intended. A number of other oddities in the Udruh text are not resolvable based on the published photograph.

³ Kennedy and Falahat 2008, 163-64. For Flavianus, see *PLRE I* Flavianus 1; Euseb., *Mart. Pal.* (S) pref. (L) 1.1, 1.5; Barnes 1982, 152. The province continued to be officially known as *Syria Palaestina* in c.310/11 (*AE* 1964, 198 = 1993, 1618).

⁴ *PLRE I* Urbanus 2; Barnes 1982, 152.

⁵ Tracy 1999, 305-7 = *AE* 1999, 1702. The text was originally published separately as *IGLS XXI* vol. IV, 40, 41, 53.

⁶ It is difficult to expand the abbreviation *p. p.* with any certainty. Tracy (1999, 307) read *p(atrici) p(iissimo)*, though he also considered *p(atrono) p(erpetuo)*. The former reading would be unprecedented on an imperial dedication: *p(atrici) p(atriciae)* would be more appropriate. However, as Tracy correctly noted, *pater patriae* usually follows the emperor's name and is generally placed last among his titles.