

# The Exchange of Goods from Italy to India during the Early Roman Empire – The Range of Travelling Times

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## Abstract

This paper examines the evidence for the time taken for a circuitous flow of goods between Italy and India to occur. It is argued that the distinct nature of the Mediterranean and Indian Ocean trading spheres meant that it was often not possible for this circuit to be completed within one year. In particular, a comparison of papyrological, epigraphic and literary sources indicates that a variety of natural and manmade factors greatly impacted on these schedules. Consequently the goods which were traded between these two economic zones fluctuated in volume, nature and the prices for which they were sold.

During the 1<sup>st</sup> - 2<sup>nd</sup> centuries AD a hitherto unprecedented volume of goods was being exchanged between the Mediterranean and India. These included items acquired from India such as aromatics and spices, textiles, exotic woods and gemstones.<sup>1</sup> Many of these goods were consumed by the elite, particularly at Rome with its great concentration of wealth and its competitive social environment which encouraged the extravagant and public display of such high value goods.<sup>2</sup> Panegyrists like Aelius Aristides commented on the great flow of goods into Rome, even from lands as far away as India, while Pliny the Elder discussed a great variety of Indian (and other) goods that were available in the markets at Rome.<sup>3</sup> The impression given by these literary sources is of wide availability and high demand for these goods. Indeed, some modern scholars have gone so far as to claim that the flow of such goods

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<sup>1</sup> For an overview of the imports and exports in the Indian Ocean trade, see Cobb 2011, 289-353.

<sup>2</sup> For examples of extravagance and the competitive social environment which encourage the consumption of these types of goods, see Suetonius *Nero* 27.3, 30.1; Tacitus *Annals* 3.54, 6.14.47; Juvenal *Satires* 7 lines 141-45; Horace *Epodes* 8. 13-20; Plutarch *Moralia* 528a; Seneca *Epistles* 110. 17; Pliny *NH* 9. 117; for a discussion on this issue, see Cobb (2011), 184-97.

<sup>3</sup> Aelius Aristides *To Rome* 10-13; Pliny *NH* esp. books 12-13 and 37.

was unaffected by events and continued at a steady pace.<sup>4</sup> However, this impression has the effect of obscuring the nature of the economic links which connected these regions, and in particular the trading schedules.

This article argues that the reality was in fact more complex, with the exchange of goods between Italy and India being subject to a variety of environmental and man-made factors which could impact on their volume and flow. Specifically it is argued that it was not possible for a return exchange of cargo to take place between Rome (via the ports of Puteoli and Ostia) and India within one year. This is not to suggest that Rome did not receive goods acquired from India each year or that India did not receive goods coming from the Mediterranean. Rather, it is intended to highlight that the links between Rome and Alexandria, and Alexandria and western India were two distinct networks of exchange. The consequences of which meant that the goods which were traded between these two economic zones fluctuated in volume and in nature, and eventually in the prices which would be charged for these goods in the markets at Rome.

It needs to be stated from the outset that this article is not intended to suggest that individual merchants would always accompany or retain possession of such goods throughout the journey from Italy to India (or vice versa) or that the composition of such cargoes would remain unchanged until reaching a terminal-point of exchange. Archaeological finds at southern Arabian ports like Qana' and Khor Rori show that goods of a Mediterranean origin were exchanged (or gifted) at these ports, and it highly likely, not least to ensure the safety of the sailing vessel by having sufficient ballast and correct stowage, that some new goods were incorporated into a ship's hold before sailing onto India. The presence of basalt rocks from these regions at the ports of Myos Hormos and Berenike also indicate that some merchants may have chosen to unload their cargoes at these ports and return to the Red Sea coast with incense and perhaps a mix of Arabian, Indian and east African goods available at these ports. Such

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<sup>4</sup> Smith 2009, 82; see also Morley 2007, 31.

negotiations, acquisitions and exchanges would have further impacted upon the time it took for goods acquired in India to reach Rome (and vice versa).<sup>5</sup>

That said, the direct custody of goods over significant distances did take place as indicated by a document known as the Muziris Papyrus which stipulates the transport arrangements for some goods acquired at the port of Muziris in India and which were to be transported under supervision to Alexandria. The literary sources also indicate the existence of both direct and indirect voyages between the Red Sea and western Indian Ocean. In addition, there is evidence for the presence (and perhaps temporary residence) of Indian and Arabian merchants at the Red Sea ports from written and archaeological evidence, including Indian cooking ware found at Myos Hormos and Berenike, while some of the literary sources mention the presence of Indians and Arabians at Alexandria.<sup>6</sup> This article, however, is primarily interested in the successive stages of transit for such goods (whether retained by the same group of merchants throughout the journey or not) and the organisational, bureaucratic and climatic factors which impacted on the times taken for these goods to reach each subsequent stage.

It is also important to note that while this article is examining the transit of goods between Italy and India this does not mean that all these goods were exclusively “Italian” or “Indian”. Goods from Italy such as wine and bronze-wares were exported to India as is clear from the written and archaeological evidence (see below), but this was alongside a variety of goods from elsewhere in the Mediterranean such as coral from the seabed around the iles d’Hyeres and glassware from the Levant and Egypt.<sup>7</sup> Nevertheless, it is clear that these goods would have been brought to significant entrepôts such as Alexandria, through a variety of maritime, river and overland networks, and merchants wishing to trade with India are likely to have assembled them in these locations.

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<sup>5</sup> Sedov 1996, 12-19; Sedov 2007, 76-89, 92 (Qana’); Avanzini 2008, 615-18 (Khor Rori); for a general discussion see Tomber 2008, 105, 157-58; for the issues of ballast and stowage see McGrail 1989; Pliny *NH* 6. 26. 104 (incense trade).

<sup>6</sup> (Muziris Papyrus) - P. Vindob G 40822 Recto, Column 2 lines 12-26; (sailing over open water) Pliny *NH* 6.26.100-01; Periplus 57; For Indian cooking-wares see Whitcomb 1982, 67; Tomber 2000, 624-30; Tomber 2005, 226; for written evidence Begley 1996, 23-24; Salomon 1991, 731-35; for a general discussion Tomber 2008, 157; Dio Chrysostom To the Alexandrians 32.40; Xenophon of Ephesus 3.

<sup>7</sup> See footnote 1.

Various centres in India also acted as major transshipment points as seen with the port of Muziris (modern Pattanam) which reveals pottery fragments of east Indian, Yemenite, Parthian/Sassanian, Nabataean and Roman origins.<sup>8</sup> The port of Arikamedu on the southeast coast of India also had well attested trade links with regions of Southeast Asia.<sup>9</sup> Thus goods with a variety of different origins would have been available at many major ports, a situation attested in the Periplus Maris Erythraei (henceforth Periplus), a mid-1<sup>st</sup> century AD text concerning the conditions of sailing in the Indian Ocean and the types of goods demanded at various ports. This may, in part, be responsible for the vague and sometimes erroneous notions held by many ancient authors concerning the origin of certain goods, especially plant products like spices and aromatics.<sup>10</sup> From the perspective of many Romans any link, real or imagined, with India imbued such goods with exotic associations.<sup>11</sup>

The evidence for reconstructing these trading schedules mostly comes from the written sources. Pliny (NH 6. 26. 96-106) in particular has provided detail about the journey from Alexandria to India and back. The sources for Pliny's information include the earlier account of Onesicritus and Juba, but also contemporary merchant accounts of these routes, providing detail similar to that contained within the Periplus according to Parker.<sup>12</sup> The author of the Periplus records the journeys from the Red Sea ports to East Africa, the southern Arabian Peninsula, and India, but says nothing about the return journeys. Little is known of this author except what can be inferred from the text. However, it is clear that he was a mid-1<sup>st</sup> century AD Greco-Egyptian merchant writing largely from his own personal experience of trading in the Indian Ocean. Recent research has suggested that the information that he provides in terms of distances, timing and location of ports is often fairly accurate, which is useful since his account sometimes compliments the detail given by Pliny (see below).<sup>13</sup> Strabo and Pliny also record

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<sup>8</sup> Shajan, Tomber, Selvakumar, and Cherian 2004, 312-17; Selvakumar, Shajan, Tomber 2009, 35-36.

<sup>9</sup> Francis 2004, 450-479, 502, 513-14; Glover 1996, 150-51.

<sup>10</sup> See for example the mistaken belief that Arabia produced cassia, cinnamon and ginger - Diodorus 3.46.1-5; Strabo 16.4.19; Dioscorides Materia Medica 1.12; Statius Silvae 4.5.30-32; Arrian Anabasis of Alexander 7.20.

<sup>11</sup> Parker 2008, 152-53, 164-65, 196-97.

<sup>12</sup> For these passages of Pliny see Mazzarino 1997, 72-79; Tchernia 1997, 250-60; Parker 2008, 188.

<sup>13</sup> Casson 1989, 6-8; Turner and Cribb 1996, 318; Tomber 2008, 20-21.

travel times across the Eastern Desert. Strabo, despite his apparent contempt for the testimony of merchants (15. 1. 4), nevertheless does record accounts of contemporary merchants when he was at Syene (Aswan) alongside the information gleaned from Aelius Gallus' expedition to the south-western Arabian Peninsula (2. 5. 12; 17. 1. 13, 45). It is also possible to assemble information from various comments made by ancient authors, such as Lucian and St Paul, which provide details about sailing between Alexandria and Italy.<sup>14</sup>

These literary sources are supplemented and challenged by other forms of evidence, notably papyri and inscriptions/graffiti. It is argued here that given the nature of the evidence it is more appropriate where possible to provide a plausible range of travel times rather than an average, since this more accurately reflects how different circumstances impacted on the transit of goods. The relatively consistent climatic patterns in the Mediterranean and the Indian Ocean mean that the varied dates of the sources should not be a bar to piecing them together to provide a coherent picture. Comparative evidence from medieval and early modern documents also provides a check on the information provided by our sources.

Besides the major sea (and mixed land) routes that went via the Red Sea, another major routes existed which utilised the Persian Gulf, while overland routes were also in operation via the Arabian Peninsula and across Asia, the latter often referred to as the Silk Road(s).<sup>15</sup> Incense and perhaps other goods were conveyed along overland routes from southern Arabian Peninsula and from the territory of the Gerrhaeans (along coast of Persian Gulf) to centres such as Petra, Bostra, Gaza, Antioch and Damascus.<sup>16</sup> Various overland "Silk Roads" stretched from Syria and northern Mesopotamia going through the Euphrates valley through the territory of Parthia (Iraq/Iran) and into central Asia.<sup>17</sup> Unfortunately this article does not have the scope to discuss these alternate routes.

### *Italy to Alexandria*

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<sup>14</sup> For sailing times in the eastern Mediterranean see Casson 1950; Duncan-Jones (1990).

<sup>15</sup> See Appendix 1, for a separate discussion of the Persian Gulf route.

<sup>16</sup> Bowersock 1983; Millar, 1998; Tomber 2008, 101-02; Young 2001, 90-135; See Rougé 1986, for river-canal connects in Syria-Levant.

<sup>17</sup> Millar 1998; McLaughlin 2010, 83-109; Wood 2002; Young 2001, 187-200.

The focus in this paper on exchange between Rome and India is not intended to downplay the fact that many goods imported via the Indian Ocean would have been consumed across the Roman Empire. Alexandria was not just a major trade hub but also itself a major centre of consumption with wealthy elites who could afford such goods.<sup>18</sup> Indian and other eastern goods were certainly available at other major urban centres of the Empire.<sup>19</sup> However, as has been stated, Rome, especially in the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD, held the greatest concentrations of wealth in the hands of very competitive elites who frequently displayed this in lavish social terms.<sup>20</sup> It is also clear that Italy produced some of the goods exported to the ports of the Indian Ocean, as can be seen from the popularity of Italian wine in India and finds of Pompeian amphorae.<sup>21</sup> The ports of Puteoli and Ostia and that of Alexandria provided the main conduits for the flow of goods between the eastern and western Mediterranean, as indicated by the comments of Strabo and by Duncan-Jones' analysis of the distribution of famous lamp types.<sup>22</sup>

The sailing seasons for the Mediterranean are famously reported by Vegetius who states that the safest period was June to mid-September; the risky periods were mid-March to mid-May and mid-September to mid-November; while mid-November to mid-March was *mare clausum*.<sup>23</sup> Most sailing took place between mid-April and mid-October, since in the winter severe storms and fog affected visibility until late spring. This often meant that vessels wintering in Italy departed for Alexandria in spring in order to sail back to Italy in late summer, while those wintering in Egypt did the reverse. The summer period offered ideal conditions for sailing from Puteoli/Ostia to Alexandria, since the prevailing winds in the Mediterranean at this time are from the northern quadrant. Once a merchant vessel reached

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<sup>18</sup> See Fraser 1972; for estimates of the population of Alexandria at around 500,000, see Delia 1988, 275-92.

<sup>19</sup> For different eastern trade routes into the Roman Empire, see Rougé 1986; Young 2001; Wood 2002; McLaughlin 2010.

<sup>20</sup> For concentrations of wealth see Jongman 2007, 592-618.

<sup>21</sup> For the distribution of Italian wine amphorae in India, see Suresh 2004, 99-100, 182-83; Sidebotham 2011, 191, 233 n.119; Tomber (2007a), 972-73, 979; Tomber 2009, 43; Cherian et al 2009; Shajan et al 2004; Selvakumar, Shajan, and Tomber 2009; Agarwala 1985, 5; Slane 1991, 212; Thapar 1997, 13; Williams 2004, 441-50; Williams and Peacock 2005, 140-48; for an overview, see Cobb 2011, 204-05.

<sup>22</sup> Strabo 17.1.7, 13; Duncan-Jones 1990, 57-58.

<sup>23</sup> Vegetius *Epitoma rei militaris* 4. 39. – the “safe season” is 6 days before the Kalends of June (27<sup>th</sup> May) till 18 days before the Kalends of October (14<sup>th</sup> September) – the “risky seasons” are from after 14<sup>th</sup> September until 3 days before the Ides of November (11<sup>th</sup> November), and from 10<sup>th</sup> March till Ides of May (15<sup>th</sup> May) – the “closed season” is from the 11<sup>th</sup> of November till the ides of March (10<sup>th</sup> March). – see Milner (1993).

Messina, at the northeast tip of Sicily, it was possible to sail with speed directly for Alexandria across the open sea (1000 nm distance) with a favourable wind on the stern.<sup>24</sup> It is usually estimated from literary sources that a ship sailing in favourable conditions could reach average speeds of 5-6 kn (1 kn = 1 nm (1.852 km) per hour).<sup>25</sup>

Pliny (NH 19. 1. 1) reports that two prefects of Egypt, Galerius and Balbillus, reached Alexandria from the straits of Sicily in six and five days respectively, and also that Valerius Marianus reached Alexandria from Puteoli in eight days. These times are clearly exceptional, otherwise they would not be worthy of mention. Indeed to achieve this it assumes a consistent sailing speed of 6 kn sailing 24 hours non-stop (1000 nm / (6 kn x 24 hr) = roughly seven days). Other evidence suggests that such journeys would normally have taken longer. A study by Duncan-Jones has collated documents from Egypt which recorded the earliest reference to the death of an emperor and the accession of a new one. He noted that on average it took 52 days for news of the death of an emperor and 62 days for news of their accession to reach different parts of Egypt during the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD. One of the fastest times relates to the accession of Galba when news reached Alexandria at least 27 days (6<sup>th</sup> July) after word of Nero's death (9<sup>th</sup> June). News of Galba's accession also reached the Thebiad 14 days later.<sup>26</sup>

Duncan-Jones acknowledges that a variety of factors affected the speed at which the news travelled including weather, season of travel, bureaucratic delay, and whether the news travelled directly or indirectly. One particular difficulty with his method is that the documents are not always found in Alexandria, but in other parts of Egypt, and as a result it is impossible to know how much this affects the average. Nevertheless, the medieval Geniza documents record that travel from Palermo on the northern coast of Sicily to Alexandria could take merchant vessels anytime between 17 days for a good journey to 35 days for an excessively slow one.<sup>27</sup> The difference between the ship designs used in either

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<sup>24</sup> Casson 1950, 51; Casson 1974, 150-52; Duncan-Jones 1990, 16-17; de Donato 2003, 23; McGrail 2004, 93; for the dangers of sailing in winter see Philo Against Flaccus 125; On the Virtues 49.

<sup>25</sup> Casson 1971, 281-99 – good speed 4½-6 kn, sailing against the wind 2-2½ kn; see also Whitewright 2008, 315-23, who notes from literary testimony that the average speed under favourable winds was 4.4 kn, and under an unfavourable 1.8 kn.

<sup>26</sup> Duncan-Jones 1990, 6-9, 25; OGIS 669; O. Bod 604; W. O. 1399.

<sup>27</sup> Duncan-Jones 1990, 7-9, 11, 16-17; Goitein 1967, 324 (Geniza documents).

period will have influenced these figures somewhat, although weather conditions seem to be a much more important factor. The times recorded in the Geniza documents are less than Duncan-Jones' average (not surprising as these voyages would have normally taken place within season), but accord with the documented 27 days it took for news of Galba accession to reach Alexandria. Even with these correlations the distinct nature of these pieces of evidence would not warrant imposing a fixed average. However a range of plausible times can be justified. Thus an optimistically fast journey would have taken around a week, but at the pessimistic end of the scale around nine weeks (though one suspects the norm was probably three to four weeks).

### *Alexandria to Koptos*

Ancient sources report that the merchants of Alexandria traded with India, and that the city received all the goods from the Red Sea and India.<sup>28</sup> It is also known from the Muziris Papyrus that Alexandria was the centre where the tetarte (25% tax) was levied on goods imported via the Indian Ocean prior to being sold in the markets of the Mediterranean.<sup>29</sup> At the same time goods from the Empire were assembled at Alexandria for export to India and elsewhere in the Indian Ocean. However, first it was necessary for them to be transported along the Nile to Koptos, and then subsequently to be taken across the Eastern Desert to the Red Sea ports. It is this first part of the journey that we deal with here.

Pliny (NH 6. 26. 102) mentions that two Roman miles distant from Alexandria was a place called Juliopolis, and it was from here, when the Etesian wind (north wind) was blowing, that the merchants sailed down to Koptos in 12 days (380 Roman miles). This figure does not appear unreasonable since it equates to around 46 km a day.<sup>30</sup> Moreover Agatharkhides claimed that it was possible to sail from Alexandria to Ethiopia (let alone the Thebaid) in ten days.<sup>31</sup> These figures are also in line with the above mentioned document which indicated that news of Galba's accession travelled from Alexandria to the Thebaid in at least 14 days. Transport by the Nile has often been assumed to be

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<sup>28</sup> Strabo 2. 12. 170; Dio Chrysostom 32. 36; Josephus Jewish War 2. 382-86.

<sup>29</sup> P. Vindob G 40822; see also Strabo 16. 4. 24, 17. 1. 13.

<sup>30</sup> 380 Roman miles equals about 560 km; however, see Rougé 1986, 47, who notes that the distance was 850 km, hence 71 km a day.

<sup>31</sup> Agatharkhides in Photius, Cod. 250. 66, 454b-455a; and Diodorus 3. 34. 7 – see Burstein 1989.

relatively easy due to the advantage of prevailing northerly winds for those sailing downriver while the northern flowing currents were advantageous for the return journey to Alexandria.<sup>32</sup> However, a recent study by Cooper highlights the fact that the seasonality of the currents and the winds had a big impact on the volume and speed with which goods could be transported. In particular, the period between February and June was difficult due to the low level of the Nile making the transport of cargo problematic. This was precisely the period when goods needed to be brought down from Alexandria in order to arrive at the Red Sea ports in time for departure (see below). Cooper's analysis of medieval and early modern records suggests an average journey time of around three weeks between Cairo to Qus (near ancient Koptos), though he notes that many of these journeys were not in cargo vessels but in swifter crafts.<sup>33</sup> Consequently the 12 days journey down the Nile stated by Pliny seems to reflect favourable circumstances rather than a consistent average and a journey time of several weeks may not have always been possible to avoid.

The wind and current conditions of the Nile were not the only issue affecting the time it took to get goods from Alexandria to Koptos. Organisational and bureaucratic factors, as well as corrupt officials, could cause delays. Several Roman period papyri from Egypt reveal tax-farmers slowing departures through searches, sometimes in order to be deliberately bribed for quicker release.<sup>34</sup> In addition Duncan-Jones notes that governors' edicts sent from Alexandria could take as long as two months to reach the south, while the time allowed in Roman period legal sources for a northbound journey from the Thebaid to Alexandria was 50 days.<sup>35</sup> This seven week period may have been given to provide a degree of leeway. Nevertheless, it is clear that corrupt official or bureaucratic inertia could easily cause delay to a journey and must have been an ever-present problem for merchants travelling down the Nile. In summary, while the journey itself could have, in optimistic circumstances, taken just

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<sup>32</sup> Curtin 1984, 97.

<sup>33</sup> Cooper 2011, 194-206; see also Duncan-Jones 1990, 13-14; Rougé 1986, 44-47.

<sup>34</sup> Lewis 1983, 141-42 - SB 8072 (tax collectors wishing to be bribed); P. Oxy. 36 (delays caused by customs searches); Ps.-Quintilian Declamations 359 (right of confiscation); see also van Niff 2008, 289-90.

<sup>35</sup> Duncan-Jones 1990, 8; BGU 5. 1210.

under two weeks, seasonal conditions on the Nile and corruption and bureaucracy may have resulted in a slower journey of a few months to reach Koptos.

### *Koptos to the Red Sea Ports*

Koptos was the main emporium connecting the Nile to the Red Sea ports during the Roman period as indicated by both Strabo (17. 1. 45) and Pliny (NH 6. 26. 102-103). The former mentions that all Indian, Arabian and Ethiopian merchandise was brought through the Red Sea to Koptos, the latter states that individuals coming down from Alexandria arrived at Koptos before embarking on a journey through the Eastern Desert. Other evidence testifies to Roman period activity along the routes from Koptos to the Red Sea ports of Myos Hormos and Berenike. These include the Nikanor archive, a series of business receipts confirming delivery of goods from Koptos to Myos Hormos and Berenike and the Muziris papyrus, a mid-2<sup>nd</sup> century AD document recording a supplementary loan on the obverse and arrangements for transport of goods on the reverse. The latter states that a public customs house was located at Koptos where goods were placed under seal and loaded onto boats bound for Alexandria.<sup>36</sup> In addition, an official inscription referred to as the Koptos Tariff (dated to AD 90) describes the tolls charged for people and animals crossing the Eastern Desert.<sup>37</sup>

The routes between Koptos and Myos Hormos and Berenike were not the only ones to exist in the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD. However, it seems the other routes were seldom used in this period. The roads between Apollonopolis Magna (Edfu) and Berenike were mainly used during the Ptolemaic period, and they appear to have started to decline in favour of Koptos by the 1<sup>st</sup> century BC.<sup>38</sup> The route from Qena to the port of Abu Sha'ar in the north of the Eastern Desert did not become active until the Tetrachic period, while the route via canal from Babylon (Old Cairo) and the port of Klysma does not

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<sup>36</sup> O. Petr. 220-304 (Nikanor Archive); P. Vindob. G 40822 recto, col. 2. 4-9 (Muziris Papyrus).

<sup>37</sup> OGIS 674 = IGRR I. 1183 = I. Portes 67.

<sup>38</sup> For the Edfu-Berenike route, see Manning 2010, 113; Wright 2003, 228-29; Reddé 2006b, 237-38; Cohen 2006, 324 n.6; for a rise in the importance of Koptos during the Ptolemaic period, see Cobb 2011, 56-58.

seem to have been heavily in use until the late antique/byzantine period.<sup>39</sup> Even the *Via Hadriana*, a route leading from the Nile at Antinoopolis (Sheik 'Ibada) to the ports along the Red Sea coast down to Berenike, shows little evidence of use. This is despite a dedicatory inscription claiming to provide guard-posts and watering places for travellers.<sup>40</sup>

The journey between Koptos and Myos Hormos was the shortest of all the routes in the Eastern Desert. This route also had the greatest concentration of stations which protected the wells and cisterns in the Eastern Desert, with one placed roughly every 16-18 kilometres, while the Koptos to Berenike route had stations only every 30-40 kilometres.<sup>41</sup> Strabo (17. 1. 45) states the journey between Koptos and Myos Hormos took six to seven days, and that in the past merchants travelled only by night carrying water with them. However, he claims that by the time of his writing *hydreumata* (wells) had been constructed. This route is fairly level and devoid of serious obstacles, besides the lack of water.<sup>42</sup> Unlike Strabo, Pliny (NH 6. 26. 102-03) describes the route between Koptos and Berenike stating that the journey took 12 days. He also describes the stations along this route where fresh water could be acquired, but that the greater part of the journey was undertaken by merchants and their camels at night in order to avoid the heat.

Maxfield, citing contemporary Bedouin accounts and the British Army Camel Corps training manual, states that a laden camel could travel 24 to 32 kilometres comfortably in 6-8 hours per day. This makes the journey time from Koptos to Berenike 12-16 days (a 380 km journey), in line with the time stated by Pliny.<sup>43</sup> Equally these figures equate to a journey time of five to seven days (a 173 km journey) on the Myos Hormos route, assuming that six to eight hours was a normal day's journey. The Koptos Tariff and the Muziris Papyrus indicate that goods or people arriving at Koptos or the Red Sea ports were assessed for tax purposes, while a group of ostraka found at Berenike also shows that it was

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<sup>39</sup> Abu Sha'ar - Sidebotham 1991, 19; Klynsma - Mayerson 1996, 120-23; Young 2001, 77; Ward 2007, 161; Cohen 2006, 327, 329 n.6; however, for literary sources referring to it in the 2<sup>nd</sup> century, see Ptolemy *Geography* 4. 5; Lucian *Alexander the False Prophet* 44.

<sup>40</sup> Young (2001), 78-79; Sidebotham, Zitterkopf, and Helms 2000, 115-26; Sidebotham and Zitterkopf 1998, 274; *OGIS* 701.

<sup>41</sup> Zitterkopf and Sidebotham 1989, 169; Sidebotham, Hense, and Nouwens 2008, 90-91.

<sup>42</sup> Reddé 2006a, 39-49.

<sup>43</sup> Maxfield 1996, 11-12.

necessary to pass through customs.<sup>44</sup> It is also clear from ostraka found at Krokodilo that the nomadic inhabitants of the Eastern Desert could cause a serious threat to those travelling through it, at least during the reigns of Trajan and Hadrian.<sup>45</sup> Unfortunately this evidence does not indicate how time-consuming these processes were or how banditry might cause delay, though waiting to travel in large groups may have been a safe practice. Therefore it is safest to calculate on the available evidence that a journey from Koptos to these Red Sea ports could take from one to two weeks.

### *To India and back to the Red Sea*

In Pliny's (NH 6. 26. 104) description of the voyage to India he reports that vessels set sail from the Red Sea ports before the rising of the Dogstar (Sirius), while the author of the Periplus (39, 49, 56) states a ship would depart in July, the Egyptian month of Epeiph (see Fig. 5). In Pliny's day the pre-dawn heliacal rising of Sirius (Dogstar) was mid-late July, thus his statement broadly coincides with the author of the Periplus.<sup>46</sup> The winds in the Red Sea were predominately north-westerly, particularly around the northern third of the Red Sea where Myos Hormos and Berenike are located. They are especially strong during this period thus providing an advantage to merchants sailing down to the Gulf of Aden. Nevertheless, and due to the growth of coral reefs it was difficult to sail down this stretch of sea and to make port without specialist knowledge.<sup>47</sup>

Pliny reports that merchant vessels departing from the Red Sea ports could make it to Ocelis or Kane in 30 days.<sup>48</sup> Casson finds this statement suspicious because Kane (Hadrami port of Qana' – modern Husn al Ghurab) was about 200 miles further on from Ocelis (on the straits of the Bab el Mandeb).<sup>49</sup> However, this curious statement can be explained if we assume that Pliny meant it was

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<sup>44</sup> Muziris Papyrus – see notably P. Vindob G 408222 Verso Column 2 lines 1-29 and Recto Column 2 lines 3-11; Koptos Tariff - OGIS 674 = IGRR I. 1183; O. Ber. 1-106.

<sup>45</sup> For these documents, see Cuvigny 2005.

<sup>46</sup> See Pliny NH 18. 68. 268-271; See also Hannah 2005, 24, 26; Lehoux 2007, 11, 121-22, 142, 305-07.

<sup>47</sup> Casson 1980, 31; Chaudhuri 1985, 128; Whitewright 2007a, 78, (and 79-81 for maps of prevailing winds in the Red Sea).

<sup>48</sup> Pliny NH 6. 26. 104 – navigare incipient aestate media ante canis ortum au tab exortu protinus veniuntque tricesimo circiter die Ocelim Arabiae aut Canen turiferae regionis.

<sup>49</sup> Casson 1980, 32-33.

possible or necessary to reach one of these ports in 30 days, not that this was how long a direct voyage would take. Once in the Gulf of Aden both Pliny and the author of the Periplus differ on which ports to depart for the journey to India. The Periplus declares that merchants either put out to sea from the port of Kane or crossing the Gulf of Aden towards the Horn of Africa, departed from Cape Guardafi and the island of Socotra. By contrast Pliny states that sailors from Egypt set out from Saugros (Ras Fartak) with the southwest wind to Patale (near the Indus Delta), or from Ocelis (Sheikh Sa'id) to Muziris (Pattanam) in southern India. As later Arab accounts reveal setting out from the right location around the Gulf of Aden could greatly affect the ability to reach your destination.<sup>50</sup>

Pliny (NH 6. 26. 99-105) states that from Ocelis, with the Hippalus wind (southwest monsoon) blowing, it was possible to arrive at Muziris (Pattanam) in 40 days. Debate has arisen over whether this was a realistic figure since the distance between Ocelis to Muziris is 2,000 nm, implying an average speed of 2 kn. Casson has suggested that Pliny may have been in error, while Robert suggests that he may have included time stopped off in the ports in the Gulf of Aden.<sup>51</sup> The times are likely to have varied depending upon the point of departure. The Arabic source the Akhbar reports that a journey from Muscat (Oman) to Malabar (southwest India) took one lunar month (29-30 days), while the Tuzuk-i-Jahangiri reports that it was possible to sail from Mocha (Yemen) to Surat (northwest India) in 14 days. It should be noted, however, that unlike the Greco-Roman sailors, the Arabic sailors utilised the northeast monsoon for outbound and return journeys; in the case of the former by tacking in a south-westerly direction.<sup>52</sup> Regardless of whether it took two weeks or six, it was necessary for Roman vessels to reach the west coast of India by the latter half of September because arriving too early meant encountering rough conditions along the shores of western of India in August, while arriving too late risked being caught up in the transition period of the northeast monsoon (October-November). The need for strict timing meant it was vital to depart from the Red Sea around July.<sup>53</sup>

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<sup>50</sup> McGrail 2004, 257; Robert 1997, 246; Periplus 57; Pliny NH 6. 26. 104; Chaudhuri 1985, 131 (medieval accounts); see Fig. 4.

<sup>51</sup> Casson 1980, 33; Robert 1997, 254.

<sup>52</sup> Tuzuk-i-Jahangiri cited in Chaudhuri 1985, 123 n.5; Akhbar cited by Hourani revised by Carswell 1995, 26-28, 74.

<sup>53</sup> Casson 1980, 34; Chaudhuri 1985, 127-28; Düing 1970, 12, 14, 21 (climatic conditions).

Pliny states that travellers returning from India set sail at the beginning of the Egyptian month of Tybi (Roman December), or at least before the sixth day of Mechir, the Roman Ides (13<sup>th</sup>) of January. In so doing they could catch the northeast monsoon on entering the Red Sea. This enabled merchants to depart from Alexandria and return within a year.<sup>54</sup> The northeast monsoon was more benign and gave much more leeway for departure from India since it lasted from November to April, though the Arabic sea-captain Ibn Majid reported that anyone who left from India after early April was either a fool or desperate.<sup>55</sup> These winds also provided favourable south or south-eastern winds for sailing up the Gulf of Aden between November-December to March-April. In particular, March-April provided goods winds up to 25° N parallel. Because of dangerous shoals in the Red Sea a vessel would only sail during the day and would anchor towards nightfall.<sup>56</sup> A graffito of Gaius Numidius Eros in a cave in Wadi Mineh (near the station of el-Laqita (Phoinikon) on the Koptos-Myos Hormos road), states that he returned from India in the month of Phamenoth in the 28<sup>th</sup> year of Caesar - February or March 2 BC.<sup>57</sup> This perhaps reflects a typical time of the year for merchants to undertake a crossing of the Eastern Desert to Koptos.

However, in some cases delays and adverse conditions could result in the late arrival of ships. It was possible for Roman merchant ships with square-sailed rigs to sail wind-wards, but this was often at slow speeds (average of 1.9 kn).<sup>58</sup> A papyrus from the Arsinoite Nome describes a group of ships struggling for five hours to enter the harbour of Berenike because the winds were against them. It is dated to the first year of Nerva, 11<sup>th</sup> of Pauni (5<sup>th</sup> June AD 97). It is not specified whether the ships were arriving back from India or from the coast of East Africa. Nonetheless, given the late date of the return it is clear that the ships would have had issues with the northerly winds blowing in the Red Sea at this time, and their late arrival would have given them little time to acquire a new cargo for the next season in mid-July (assuming a cargo had not been pre-assembled). The Arabic author Ibn Majid provides a

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<sup>54</sup> Pliny *NH* 6. 26. 99-105 – in this section he mistakenly refers to the monsoon as south-western instead of north-eastern.

<sup>55</sup> Ibn Majid *al-Fawa'id* 232-33 – Chaudhuri 1985, 126.

<sup>56</sup> Casson 1980, 26, 28, 33; Sidebotham (2011), 8; McGrail (2004), 53 (journey to Adulis); Whitewright 2007a (Red Sea wind patterns).

<sup>57</sup> Winkler 1938, I, pl. VIII.

<sup>58</sup> Whitewright 2007b, 83-84; 1 Kn = 1.852 km per hour.

latter parallel account of a ship arriving at the Red Sea in late July after over three months of rough sailing, due to its foolishly late departure from India in early-mid April.<sup>59</sup>

### *Red Sea back to Alexandria*

Just as it took six to seven days to reach Myos Hormos from Koptos, and 12 days to reach Berenike, we might reasonably assume a similar time for the return journey. Again the evidence does not reveal how much time was taken up with tax procedures, bureaucratic delay or security concerns. Once at Koptos the goods would be loaded on Nile boats to be taken up to Alexandria. It has been noted above that Agatharkhides, Pliny, and a document relating to Galba's accession, indicated that travelling down from Alexandria to Koptos could take 10-14 days, and, while sailing down the Nile one would face adverse winds, these were countered by favourable currents. Nevertheless it was also mentioned that a legal document revealed that individuals were granted 50 days to reach Alexandria from the Thebiad. Thus these figures can be taken as a plausible minimum and maximum range. Consequently if a merchant arrived at Myos Hormos or Berenike in February or March at the latest, under optimistic conditions they might expect to be in Alexandria between March and April, though sailing down the Nile tended to be more favourable in the mid-Summer period of the inundation.

### *Alexandria to Italy*

The journey from Italy to Alexandria was helped by favourable winds; by contrast the return journey was arduous and lengthy, since the prevailing north-westerly winds worked against any vessel sailing to Italy. Indeed, Caesar records that he was unable to leave Alexandria due to the 'etesian winds'.<sup>60</sup> These difficulties are also apparent from Casson's reconstruction of the route taken by ships sailing from Alexandria to Italy from Lucian's *Navigium*, a description of the wayward journey of the vessel Isis, and from the Acts of St. Paul, along with climatic constants. Vessels set sail from Alexandria on a NNE course, sailing to the coast of Asia Minor or Rhodes, then heading southwest by west sailing north

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<sup>59</sup> P.CtYBR inv. 624 – see Peppard 2009, 193-98; *Tuzuk-i-Jahangiri* cited in Chaudhuri 1985, 123 n.5.

<sup>60</sup> Caesar *The Civil War* 3. 107; for delays in departing Alexandria in the Geniza documents, see Goitein 1967, 314.

of Crete, subsequently sailing beyond Malea, which was to be avoided. Reaching Malta, vessels sailed NNE for Syracuse and from there north by east for the straits of Messina. From Messina to Puteoli a vessel would need to sail NNW, unless one chose to wait at Rhegium for a southerly breeze. The captain of the *Isis*, having accidentally reached the Piraeus after a series of disasters, said it was 70 days since they had departed from Alexandria but had his vessel been on course they would have been in Italy by then. This account suggests that a journey from Alexandria to Puteoli or Ostia could take as long as two to three months.<sup>61</sup> However, one reference by Sulpicius Severus (*Dialogues* 1. 1. 30) writing around the late 3<sup>rd</sup> to early 4<sup>th</sup> century AD mentions a very successful journey from Alexandria to Massalia taking 30 days, suggesting that in some circumstances it was possible to reach Rome within a month.

Nevertheless, that a journey from Alexandria to Puteoli or Ostia may have taken two to three months is not that exceptional in the light of Venetian records of 16<sup>th</sup> and 17<sup>th</sup> centuries. Evidence collated from pilgrim voyages between Venice and Jaffa show an average outbound journey time of 44 days compared to a return journey time of 89 days. In addition, records for communications between Alexandria and Venice reveal a mean travelling time of 65 days, which accords with the account of Lucian mentioned above.<sup>62</sup>

### ***Summary***

Having examined the routes and the estimated travel times for the Red Sea route, it is possible to resolve the question of whether it was feasible to make a return journey between Italy and India within one year. If a merchant vessel departed from Puteoli or Ostia at the beginning of the sailing season in mid-April, on the most optimistic estimate it might arrive in Alexandria at the end of April, but on the latest it might arrive at the beginning of June. From Alexandria cargo could be transported under favourable circumstances down the Nile to Koptos in 10-12 days, but winds and currents as well as bureaucratic and organisational delays could cause it not reach Koptos for three months. Thus in the best case

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<sup>61</sup> Casson 1950, 43-56; Casson 1971, 271-72; *Acts* 27-28; Lucian *Navigium* 7-10; see also Heliodorus *Ethiopian Story* 4. 16 - for mention of Cape Malea; for the winds and currents in the Mediterranean see Strauss 2007, 110-12; see Fig. 3.

<sup>62</sup> Duncan-Jones 1990, 23-25.

scenario goods from Italy might have reached Koptos by early-mid May and under slower circumstances by August. Literary sources state that it took five to six days to reach Myos Hormos and 12 to Berenike, which is essentially confirmed by the accounts of modern travellers. In the most optimistic scenario a cargo from Italy could reach the Red Sea ports by the end of May with at least a month and a half's leeway before the mid-July departure for India. There is little evidence from which to assess how issues of tax and bureaucracy could have delayed the journey between Koptos and the Red Sea ports. Nevertheless even if it only took 5-12 days to cross the Eastern Desert, in the worst case scenario the cargo would not arrive at the Red Sea ports until mid-August. This would rule out travel to India for that particular season.

Under our pessimistic conditions it would have been necessary for a cargo of goods coming from Puteoli or Ostia to be sent to Alexandria, not in mid-April, but in mid-march which was during the transition from *mare clausum* to the risky sailing period. In this case the cargo could have been brought to the Red Sea ports in just enough time for the mid-July departure (see Fig. 1). Pliny states that having set out from the Red Sea ports a vessel could reach the ports of the Gulf of Aden in 30 days, and that it would then take 40 days to reach Muziris in India. This means that vessels would reach the Gulf of Aden in mid-August and would reach India by the end of September, coinciding quite precisely with the limited timeframe in which to utilise the southwest monsoon (see above).

Pliny further states that vessels would make the return journey from December to mid-January. Unfortunately he does not state the approximate duration of this return journey. The north-eastern monsoon is less ferocious than the south-western, but it provides consistent and fair winds. Optimistically, assuming it took roughly the same time for a return journey and that the merchant was able successfully to exchange his cargo for Indian goods by December, then it was possible for him to arrive at one of the Red Sea ports by February. The aforementioned papyrus from the Arsinoite Nome has revealed that under adverse conditions ships might not arrive back till June. Crossing the Eastern Desert in the 5-12 days mentioned above, it appears that under the most optimistic scenario the cargo might reach Koptos by mid-February and under the most pessimistic scenario by mid-June. Again in the best case scenario the goods could be brought from Koptos to Alexandria by the beginning of March and in the worst case scenario by mid-August.

Departing from Alexandria the goods would then take perhaps two months or three months to reach Puteoli or Ostia, but given the usual weather conditions at this time of the year it would be inadvisable to leave Alexandria before mid-March, and somewhat risky until mid-April. This means in the best case scenario the cargo of Indian goods arrived in mid-April if one was willing to take the risk of departing in mid-march, or more safely in mid-May. The conclusion from these hypothetical scenarios is that under consistently favourable conditions it was just about possible for goods to have been taken from Italy to be exchanged in India, and then return cargo to arrive in Italy 12 to 13 months later. Under consistently unfavourable conditions, and assuming the goods departed from Italy in mid-March and not mid-April, this exchange would have taken about 20 months (arriving in mid-November). There is only one scenario in which a circuitous exchange of goods between Italy and India could have been accomplished in under 12 months. This would require a departure from Italy in mid-May not mid-April, in order to reach the Red Sea ports by the end of June, leaving just half a month's leeway before departure (see Fig. 1).

These hypothetical scenarios, of course, represent the extremes, as based on the available evidence. Conditions were always variable as a result of human factors like bureaucracy and organisational delays (i.e. loading ships, waiting for goods to arrive, any exchanges or transfers of cargo), and natural factors such as weather fluctuations (even within broadly consistent climatic conditions). The duration of most journeys would have been somewhere between the extremes presented in the most and least favourable scenarios. Consequently an annual return exchange of goods between Rome and India would have been unusual. It is imperative to stress that this does not mean goods from India (and indeed East Africa and Arabia) did not flow into Rome each year, or that goods from the Roman Empire were not traded annually in the Indian Ocean. The journey from Alexandria to India and back was accomplished by merchants within a year, Pliny states this explicitly.<sup>63</sup> The round journey between Alexandria and Puteoli and Ostia was also undertaken within a year. However, for the

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<sup>63</sup> Pliny NH 6.26.106 – ex India renavigant mense Aegyptio Tybi incipiente, nostro Decembri, aut utique Mechiris Aegyptii intra diem sextum, quod fit idus Ianuaris nostras: ita evenit ut eodem anno remeant. navigant autem ex India vento volturmo et, cum intravere Rubrum mare, Africo vel austro.

most part, a journey between Italy and India was not. As a result one should envisage two separate economic chains linked together by Alexandria as the linchpin.

This may have had many potential implications. For example the proportion of western Mediterranean goods exported to India may have fluctuated to a greater extent than those coming from Egypt and the eastern Mediterranean. As noted above, Vegetius states that the safest sailing season in the Mediterranean was June to mid-September. Accordingly there would have been more traffic between Puteoli/Ostia and Alexandria in this period. Problems with ensuring prompt delivery of goods were real concerns for merchants, as recorded in the same papyrus which mentioned the late arrival of ships at Berenike (see above). In this document a merchant complains that he has not received his order of parrot-dye from the Arsinoite Nome in time for him to trade in the Indian Ocean. Hypothetically a merchant at Alexandria assembling his cargo for export in the Indian Ocean may have found fewer goods from the western Mediterranean available before June. He may have risked waiting at Alexandria until June in order to incorporate said goods into his cargo, but this strategy could backfire. It has been noted that under the difficult conditions the transport of cargo from Alexandria to the Red Sea ports could take three and a half months, in which case the cargo would not arrive until mid-August causing the merchant to miss the key mid-July departure.

The fluctuating volume of goods being traded between these economic spheres would also have affected the price at which goods imported from India would have been sold in the markets at Rome. There is a general lack of quantitative information in the ancient sources about the prices of Indian imports. However, Pliny (NH book 12) does provide some prices for spices and aromatics that were imported from India and elsewhere in the East, including pepper and malabathrum. Sidebotham has proposed that Pliny's figures represent "government price tariffs" and that the prices of these spices was regulated because they were treated as social necessities by the elite rather than as "luxuries". This contrast between luxury and necessity is problematic in itself because it conceals the complex and multifaceted use of these goods among the Roman elite.<sup>64</sup> Moreover, there is reason to doubt that the prices given by Pliny represent a fixed amount that would have been paid. Indeed, if anything, Pliny

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<sup>64</sup> Sidebotham 1986, 36, 45; For more on this issue, see Cobb 2013 (forthcoming).

gives the impression that prices for these plant products could fluctuate.<sup>65</sup> The quality on offer as well as supply affected the prices of these goods, for example stacte myrrh sold for between 3 to 50 denarii per libra; the leaves of malabathron could sell between 1-400 denarii per libra, while the leaf itself reached 60 denarii; furthermore cassia is said to be most subject to variations in price with the best quality being 50 denarii, and lesser qualities as low as 5 denarii per libra.<sup>66</sup> The instability of prices is also apparent from Pliny's (NH 12. 32. 93-94) account of the period when the cost of cinnamon rose by 50% due to the burning of groves by barbarians. In fact when fixed prices are given for spices in Diocletian's Edict of Maximum Prices (AD 301), some of them appear to be unreasonably low. Rathbone believes that this is not the result of these spices or aromatics being more common, but rather the fact that prices fluctuated so much that it was hard to fix a realistic average.<sup>67</sup>

Fluctuating prices seems to be common in most historical periods for a variety of reasons, ranging from a poor or abundant harvests, the loss of shipping at sea, and dearth or glut in various markets. The medieval Geniza documents indicate that even with an official market price, most traders buy and sell for whatever price they are able to obtain. Some of these documents also reveal the fluctuating demand for pepper and how this could affect prices, even on a daily basis.<sup>68</sup>

The stock-piling of goods in warehouses may have alleviated the issue of supply and hence price to some extent. The Muziris Papyrus indicates that there was a customs warehouse for these goods at Alexandria, and it is highly probable that private warehouses also existed (see above). In Rome the horrea piperataria (pepper warehouses) were established during the reign of Domitian, though these buildings were destroyed by a fire during the reign of Commodus, no doubt effecting prices in the market.<sup>69</sup> It may be a mistake, however, to imagine that merchants or retailers would have desired to

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<sup>65</sup> See Rathbone 2000, 47-48; Whittaker 2004, 172-74.

<sup>66</sup> Pliny NH 12. 35. 70 (stacte) – Pretia ex occasione ementium varia. stacte a \* III ad \* L.; 12. 59. 129 (malabathron) - In pretio quidem prodigo simile est. a denarius singulis ad \* CCCC pervenire libras. folium autem ipsum in libras \* LX; 12. 43. 97 (cassia) – pretia nulli diversiora optumae in libras \* L, ceteris \* V.

<sup>67</sup> Rathbone 2009, 320; see also Rathbone 2000, 47.

<sup>68</sup> Keay 2005, 220, 229-33; Goitein 1967, 44-45, 167, 218-19 – see the following examples from Geniza archive - TS 13 J 9, F 27, II. 18-19, Nahray 14; TS 16 339v, 1. 7<sup>th</sup>; TS 13 J 18, F. 8, 1-13; TS 20. 69, 1. 14; TS 16. 163; Bodl. MS Heb. A 3 (cat. 2873), f. 13, II. 31-36, 48-53.

<sup>69</sup> Loane 1944, 10; Dio Cassius 73.24.

stock-pile large amounts of goods or to drive down market prices. For one thing organic products like spices and aromatics could go stale, a fact satirically noted by Persius.<sup>70</sup> Also the detailed evidence of the Geniza documents reveal that prices for goods were affected by whether one sold at auction individually, and the time at which they arrived on the market, since being ‘behind the bales of others’, could make goods difficult to sell. Furthermore a merchant who waited too long for a good price to sell his goods would have his capital tied up.<sup>71</sup> Consequently it may not have been desirable for financiers or merchants to have stock-piled such goods for long periods of time.

Given the broad range of travel times presented in this article it should not be surprising that the volume of the goods traded between the Mediterranean and the Indian Ocean fluctuated from year to year and this almost certainly would have impacted on the prices in the markets at Rome even with the storing of goods in warehouses. This is certainly the impression given by Pliny and Diocletian’s Edict of Maximum Prices, and conforms to the evidence from later periods. It is clear from this article that we should not expect a steady flow of goods that would satisfy a consistent level of demand.

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<sup>70</sup> Persius Satires lines 6.33-37 – castigates the miserly heir for failing to ensure that the cinnamon used at a funerary banquet was still fresh.

<sup>71</sup> Goitein (1967), 193, 198, 201 - Ts 13 J 25 F. 8, 1.8, Nahray 183; DK 22<sup>+</sup>. – problems with the delay in the sale of silk in Egypt.

## Appendix 1 – The Mesopotamian and Persian Gulf Route

The other major mixed sea and land network which facilitated the exchange of goods between the Mediterranean and India was the networks running through Mesopotamia and the Persian Gulf. By the Roman period this route was not generally in use by Roman merchants, although there is evidence that Palmyrenes traversed both this route by both land and sea.<sup>72</sup> This is clear from the fact that our Roman period literary sources mostly relied on either the earlier accounts of Hellenistic sources or accounts of military expeditions connected with Roman emperors. There is also the fragmentary Parthian Stations of Isidore of Charax which provides an itinerary of routes passing through Mesopotamia and further east (c. late-1<sup>st</sup> century BC to early-1<sup>st</sup> century AD); the focus of the work is, however, very much political and military.<sup>73</sup> These authors do sometimes record distances, but are often less detailed concerning travelling times. Consequently there is a greater reliance on the detail provided by authors post-dating the classical period in order to reconstruct these timing schedules.

Goods could be brought from the sea via the Orontes and various man-made canals up to Antioch.<sup>74</sup> Those setting off from the west would depart from Antioch and cross the Euphrates from Apamea to Zeugma or, alternatively Palmyra across to the desert to Hit on the Euphrates.<sup>75</sup> Isidore (1) records it was about a 171 schoeni (one schoenus = c 3.5 m/ 5.6 km) or about 960 km from Zeugma to Seleucia-on-the-Tigris, before continuing with a discussion of the stations leading into Iran and central Asia. If this journey was entirely conducted by land then we might speculate by drawing upon the evidence of journey times seen in the Eastern Desert (see above) that this may have taken 30-40 days. By comparison Strabo (16. 27) reports that from crossing over from Syria to the territory of the Scenitae took 25 days. He also stated that merchants would travel away from the river through the desert territory of the Scenitae due to the more favourable tolls they charged. It seems that along certain parts of the

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<sup>72</sup> Salles (1995), 115-46; see for example Inv. X 96 - Young 2001, 142; Appian Civil Wars 5.9.

<sup>73</sup> See Millar 1998, 120-21; Young 2001; Rougé 1986, 41-44; Potts 1990b, 2-6, 10-12, 20-21; see Chaudhuri 1985, 43, 46-48, 58-60, for medieval evidence.

<sup>74</sup> Rougé 1986, 40.

<sup>75</sup> Strabo 16. 1. 27; Isidore 1; Rougé 1986, 42; Millar 1998, 132; Young 2001 137-38, 188-90.

Euphrates cataracts and strong currents made river travel dangerous. It was more favourable to utilise the downward currents of the Euphrates and Tigris when one reached Seleucia-on-the-Tigris and Ctesiphon.<sup>76</sup> It is likely that the need to pay protection money and the potential for hostile attacks by bandits and nomads will likely have impacted on the journey time.<sup>77</sup> Millar suggests that it would take 24 days to travel between Palmyra and Babylon, while McLaughlin asserts that it would take 42 days from Palmyra to reach Spasinou Charax by the Persian Gulf.<sup>78</sup>

Those wishing to trade with major centres such as the Spasinou Charax which received goods from India via the Persian Gulf would continue to travel southeast. The Persian Gulf is about 450 nm long and the breadth varies from 100-180. As with the route from the Red Sea, those sailing via the Persian Gulf would also, of necessity, observe the monsoon sailing seasons. From the medieval evidence it is known that dhows would depart from the area of modern Kuwait around September.<sup>79</sup> As mentioned above, unlike the Greco-Roman sailing schedule, the Arab sailing tradition did not usually employ the southwest monsoon to reach India. Instead during the winter season they sailed along the coast of the Arabian peninsula to its northern-eastern tip and then tacking southwest with the gentler northeast monsoon and smoother seas reached India. The return journey was undertaken with the same northeast monsoon to make a straight run to southern Arabian coast. Arabic sources reveal that those sailing from Muscat (Oman) at the entrance of the Persian Gulf to India would set out between the latter part of November and first-half of December; the journey taking about one lunar month (29-30 days). The sailing season from Gujarat to southern Arabian Peninsula was during the months of September to April, so a return journey is likely to have taken place around January to April.<sup>80</sup> Arrian, who narrates the voyage of Nearchus, reports that Alexander's fleet, departing from Patala (Indus) sometime between late September/October or November, reach the mouth of the Persian Gulf by January. However, the fleet hugged the coast and needed to make landfall at frequent intervals and thus cannot be seen as

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<sup>76</sup> See for example Arrian *Anabasis* 7.21.1; Rougé 1986, 42; see Pliny *NH* 5.20.85, for the issues of cataracts and currents.

<sup>77</sup> Millar 1998, 132-33.

<sup>78</sup> Millar 1998, 130-31; see also McLaughlin 2010, 97.

<sup>79</sup> Chaudhuri 1985, 128-29; Potter 2009, 7-8 - advantageous timing for the date harvest (Augustus), and pearl fishing (summer months).

<sup>80</sup> *Akhbar* cited by Hourani revised by Carswell 1995, 26-28, 74; see also Curtin (1984), 99; Ray 2003, 20.

representing a typical sailing journey for a merchant.<sup>81</sup> The seasonal evidence indicates that a circuitous journey from Persian Gulf to India and back should not have taken more than seven to eight months, but would probably not have been shorter than five months (see Fig. 2).

It has been suggested that the Mesopotamian and Persian Gulf route was quicker than the Red Sea route on the basis of the difficulty of sailing up the Red Sea.<sup>82</sup> This may be true to some extent, as the Persian Gulf was not as impeded by the strong seasonal winds and coral reefs, although it was subject to a system of prevailing northerly winds.<sup>83</sup> Indeed, the port of Siraf, half-way up the Persian Gulf on the coast of Iran, was often a preferred destination in the medieval period due to the difficulties of sailing up to the mouth of the Shatt al-Arab and the delta system that led to Basra.<sup>84</sup> Rougé has noted, from the account of Herodotus and of Mesopotamian bas-reliefs from Nineveh (c.700 BC), in comparison with latter evidence, that the types of crafts sailing these rivers tended to be small; vessels with deep drafts would have found it difficult to sail on these rivers and thus goods from seafaring ships may have to have been unloaded and placed onto barges. In addition the Euphrates and Tigris could be dangerous rivers to navigate and which could occasionally be subject to violent storms.<sup>85</sup> The disparity in the ancient evidence between the Red Sea and Persian Gulf makes a detailed comparison more difficult, but the figures examined suggest an eight to eleven month schedule between Syria/ Palmyra to India and back. This, coupled with Renaissance accounts of travel between Venice and Jaffa of a month and a half outbound journey and three month return journey (see above), tentatively suggest a schedule of 12 ½ to 15 ½ months; like the Red Sea over a year's transit/journeying time (see Fig. 2).

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<sup>81</sup> Arrian *Indica* 21.1, 33-37; *Anabasis* 6.21.1-3.

<sup>82</sup> McLaughlin 2010, 99.

<sup>83</sup> Chaudhuri 1985, 46; Potts 1990a, 23 – these winds can be particularly intense around June, become calm by Augustus, resuming in strength setting in by December (though they can be variable due to winter storms) and reaching a peak during February.

<sup>84</sup> Chaudhuri 1985, 48; Potts 1990b, 28-29.

<sup>85</sup> Rougé 1986, 42-44.

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