PALMYRA ON THE SILK ROAD: TERRESTRIAL AND MARITIME TRADING ROUTES FROM CHINA TO THE MEDITERRANEAN

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In this article, I will explore the question in how far Palmyra can be considered part of the Silk Road. The question is partly a matter of definition, partly of source criticism: what is, in general, understood by the Silk Road in geographical, temporal and material terms, and how does Palmyra fit into this picture? The question is prompted by the fact that Palmyra is rarely indicated on maps depicting eastern and western trade, while it does have many characteristics, as well as a geographical position, that makes it an important factor in eastern-western relationships. Given the new research that has been done on Palmyra in the past decade, it may be worthwhile to reconsider its position with respect to the Silk Road. It will be concluded that Palmyra is essential in defining any notion of either 'Silk Road' or 'Silk Route(s)'[1].

Introduction

Palmyra, the Syrian desert city, is sometimes – explicitly or not – considered to be part of the Silk-Road. Whether or not this makes actual sense, for a large part depends on the question whether one considers the 'Silk Road' as a viable notion at all – an issue of definitions and how far limitations of definitions can be stretched at the expense of practicality. In recent years, the Silk Road has become much of a household word in scholarship[2]. The origin of the term has been emphasized by

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[1] This article is a revised version from a paper held at the *International Conference on Hellenistic Legacies on the Silk Road, Nankai University, Tianjin, China, August 17-20, 2018.* I thank the audience for fruitful discussion and the anonymous reviewer for comments, from which the written version has profited greatly.

[2] Whitfield 2007 treats the many practical and theoretical aspects in the use of the term. See Di Cosmo/Maas 2018, 3-4 for a short overview of theoretical conceptions of the Silk Road; this study, mainly intended to introduce the contents and timeframe covered by the book (*Eurasian Exchanges from the Early Third through Mid-Eighth Century*), falls largely outside the scope of the present study, but still serves the study of Roman early imperial and late antique studies in many ways (see esp. Lim 2016).

several scholars, while opinions about the interpretation of what the Silk Road entails differ widely. It has been conceived as a Road, or several routes, a network, a metaphor, or a void term. If the existence of the Road in one of its varieties is accepted, it can be asked how it should be defined, in terms of geographical width and content. Normally, the road is defined as a merchants' route, on which Silk is the most eye-catching traded commodity ware[3]. A consequence of this definition is that the direction of the trade – and therefore the route – is normally conceived as an East-West one. Silk and silk technology, and the materials and tools to produce it, after all stem from China, and its products are found all over the Asian continent, and eventually in Northern Africa and Central Europe. Moreover, there are several modes of transport for the merchandise, either by land wagons and pack animals, or by ship. Therefore, the definition of the Silk Road is divided into terrestrial and maritime routes[4].

Given this complex background of the term, the question whether one particular place, Palmyra in case, is part of it, is a layered one[5]. Palmyra shares many characteristics with the Silk Road Trade profile: it clearly possesses a lot of trading facilities (to which we will recur below) and there is plenty of evidence of use and production of Silk on the basis of eastern material and technology. Moreover, the era in which Palmyra prospered exactly coincides with the requirements outlined by Craig Benjamin in his recent study (2018) on the ancient Silk Road styled 'The first Silk Roads Era', which is the period between 100

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[3] Merchandise makes the route a trade route, although the term Silk Road is also applied to many other movements from west to east and east to west, e.g. the example of the envoys (the Syrian merchant Maes, see Andrade 2015 and Piankov 2015; the Chinese envoys in the Han Dynasty, among whom Zhang Qian, see Yang 2015). The study by Benjamin 2018 (2018, 38 for Maes), useful as it is for discussion of the larger picture and comparative studies, takes a 'Big History' approach to the subject, making it less apt for detailed analysis of the merchant routes.

[4] Also this dichotomy can be problematized by the fact that transport by ship can follow either seas or rivers, the river being an in-between of land and sea-transport. It should be noted that also transport on land can follow the course of a river (e.g. through the river valley). There is a small but growing literature on the subject. Two works on the route between the Black Sea and Afghanistan involving land, rivers, and seas are Rtveladze 2011 and Lerner 2014. This conception of the Silk Road is opposed to the much smaller definition as used, e.g., by Beckwith (2009, 320-321), who in fact does not problematize the complex notion at all, but uses it 'to refer to the foreign trade economy' of the Central Eurasian region (the area originally designated by the German envoy Von Richthofen in order to find the ideal train track for the line Beijing-Berlin: Hansen 2012, 6-7; Waugh 2007), especially concerning luxury goods. More scholars limit the use of the term Silk Road for Central Asia, and moreover from the Fourth Century AD onwards, apparently denying earlier existence in Antiquity (De La Vaissière 2012). For an extremely skeptical view regarding the Silk-Road, even to the denial of its very existence (in that China is not taking part in ancient trade at all): Ball 2002, 138-139. See however Ferguson 1978 for an extensive study of Roman - Chinese trade, esp. 585-591.

[5] So far, I have not been able to consult the conference proceedings: 'Palmyra and the Silk Road: international colloquium, Palmyra, 7-11 April 1992', published in *Annales Archéologiques Arabes Syriennes* 42 (1996).
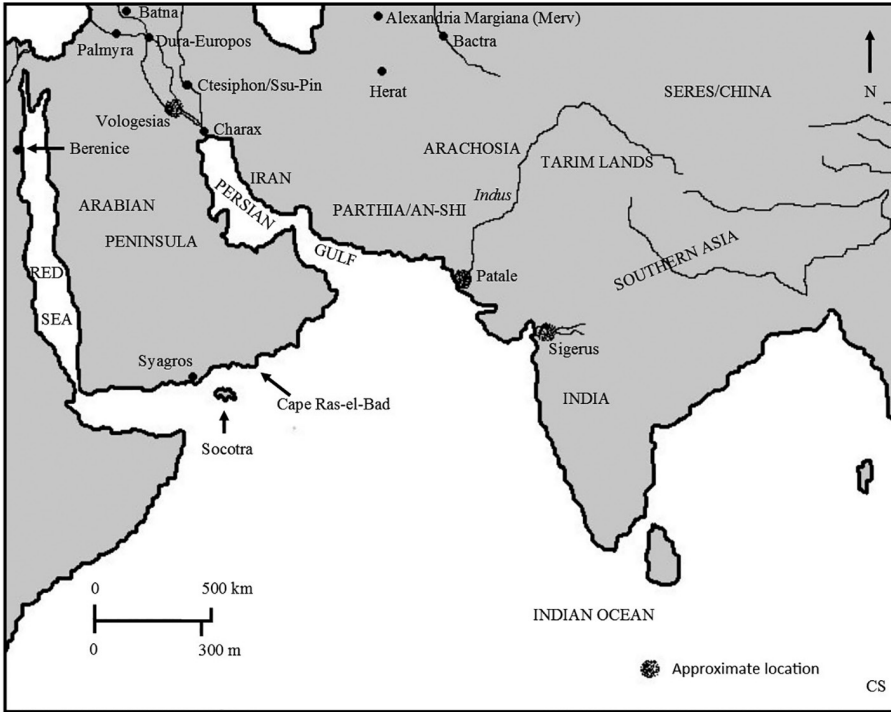
Map 1. Geographical locations on maritime routes and waterways between China and Palmyra. Drawing © Clio Stronk.

BC-250 CE (corresponding with part of the Hellenistic period up to the Early Roman Empire)[6]. In his definition, Palmyra seems to be the city *par excellence* to define an early phase of the Silk Road in its Western-Asian guise, for which many arguments can be proposed. However, in the map shown on his p. 101 (map 4.1), Palmyra is not mentioned. Another recent study on the Silk Road, by Whitfield (2018), does mention Palmyra no less than four times on maps (on maps 1, 3, 4 and 7), on none of which the city is included on the indicated trade routes. Whitfield considers the geographical stretch and the trade-material for defining the Silk-Road in her chapter 8 (pp. 196-198), but does not give any

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[6] Benjamin 2018, 135-136 supposes that Palmyra profited from "the trade between South Asian ports and the Mediterranean coast, via the Persian Gulf and Euphrates Valley", which is true, although also the Red Sea must be taken in consideration, as recent research has confirmed by ample evidence – see below (note 8). The Red Sea was used as a main trading route in times of lesser activity in the Persian Gulf during the second half of the second century CE: Cobb 2018, 69 and note 42, and 290-291.
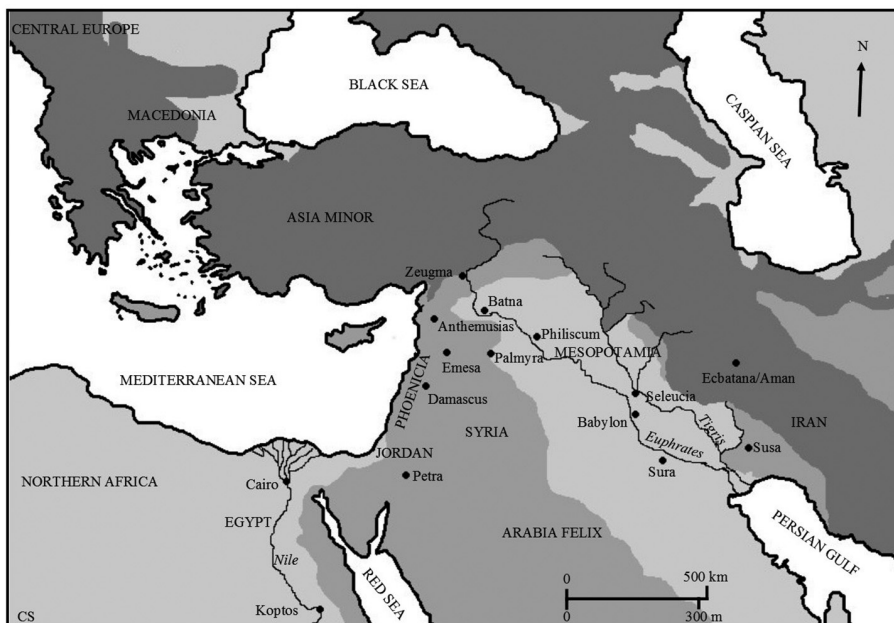
Map 2. Geographical locations on inland routes between China and Palmyra. Draing © Clio Stronk.

time-limits pertaining to trade on the Silk Road or 'silk-route(s)'[7]. In yet another study I consulted, Brentjes 2012[2], 349-350 ('Seidenstraße' in *Der Neue Pauly*), Palmyra is indicated as the only larger Syrian city on the Silk Road, on the way from Seleucia to Cairo, without further explanation. It is not until very recently that Palmyra began to acquire a place on Silk Road maps (Gupta 2019, 354).

Given this confusion in recent studies, the questions I want to elaborate further are whether conclusions can be drawn about the tracks the trade was supposed to take from any evidence in the ancient written sources. In other words, we will apply the ancient situation on the modern Silk Road concept. The quest for sources is problematic: as there are no ancient descriptions of merchants' routes, either texts with descriptions for military use can be summoned (such as Isidorus of Charax'

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[7] Whereas Whitfield 2015 does consider objects (including silk), trade and movement as characteristics for the Silk Road concept, she hardly does so for particular places, nor of directions of trade. See also Whitfield 2007. For places on the Silk Road in Central Asia and China, see Hansen 2012, including Palmyra: Hansen 2012, 6.

Parthian Stations) or geographical treatises[8]. These sources are often used to re-construct the courses of the hypothetical Silk Road(s), for want of any descriptions of merchants' routes. 'Trade', moreover, is not a clearly defined category in Antiquity, nor is economics: there was merchandise, there was exchange and there were coins and other modes of payment, but trade and economy were no categories as such in the ancients' minds[9]. A crucial literary source for the study of Southern Asian trade routes is Pliny's *Naturalis Historia*, written in the third quarter of the first century CE, when Palmyra first began to flourish[10]. Pliny not only provides us with precious information as regards our question, but also names his sources carefully. In the following, Pliny will be used as our point of departure for reconstructing the South-Eastern Asian Silk Road, and for Palmyra's position in it.

Palmyra on the Silk-Road

Palmyra, as we have seen, perfectly concords with all elements of the Silk Road, and its *floruit* is exactly the time of the 'First Silk Roads Era', given the time of prosperity in the first two or three decades of the Roman Empire and its defeat and concomitant destruction in AD 272. More studies have taken this period as identifiable unity, at least a coherent category within discernible time-limits to think with (cf. Tomber 2019). Silk-Road trade is often associated with a nomadic lifestyle, which is not an exclusive trait of Palmyrene life, and the same may hold for horse-riding and horse-breading. It is evident that Palmyra facilitated travelers and merchants, by providing them with means to travel, storage and rest. Numerous inscriptions attest of mercantile missions and guidance. Palmyra not only was a transport city: while profiting from long-distance trade, it had all the characteristics of a metropolis, for which luxury goods or the gains from trading them are the end-

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[8] Ptolemy: Lerner 1998; Marinus of Tyre: recently in Benjamin 2018, 137-139. For the *Periplus maris Erythraei* ('The Round-trip of the Red Sea'), see now: Tomber 2019; Lytle 2016, 218-222; De Romanis 2016; the standard study is Casson 1989. Isidorus of Charax' *Parthian Stations* provides information about trade on the route Zeugma-Arachosia (Afghanistan), but does not provide any information about trade round Palmyra. Sidebotham 2012, 1044-1045 about Roman Activity in the Red Sea area. Gupta 2019 emphasizes the importance of the Red Sea and – moreover – Gulf routes for Sea Trade from India to Palmyra, identifying ancient trade routes using archaeological evidence. Semitic names inscribed on ostraca found in the Port City of Berenice at the Red Sea may be of Palmyrene origin: Cobb 2018, 67 note 28. An inscription from Koptos near the Red Sea attests of Palmyrene presence: *ibid*. 68 and note 36. A Palmyrene text on a wooden tablet was found on the island of Socotra South of the Arabian Peninsula: *ibidem* 69. Socotra a trading kernel: Lytle 2016, 116; Sidebotham 2012, 1054. On Red Sea Ports in general: Sidebotham 2012, 1049-1053; Cobb 2018, 295-297 (and Palmyrene involvement). Palmyrene ships in the Gulf: Gregoratti 2019, 59 and 63-64.

[9] Millar 2006, 277 does not consider trade as a distinguishing characteristic in itself, the inhabitants at least do not consider themselves merchants.

[10] One of the earlier studies to analyze Pliny is Dihle, in his edited studies from 1984, 174-190; now: *passim*, e.g. Cobb 2018; Lerner 2014 on the inland waterways between the Black Sea, the Caspian Sea and the Indian Ocean.

point and ultimate goal. The permanent state of political independence and imperial tendencies as seen in the mid-third century, confirm its status as a self-assured city, much more than a transfer port[11].

Palmyra's economic rise largely corresponded with the decline of the city of Petra, some hundreds of kilometers further to the south in present-day Jordan. Petra is sometimes conceived to be part of the Spice Road, that connected India, the Arabian Peninsula and Africa. The reasons for its decline may be manifold, but the more central position of Palmyra connecting the Asian inlands with the Phoenician ports and access to the core of the Roman empire, may have been one of them[12]. Rome had already begun to rule the Mediterranean waves in the first half of the first century BCE, but political stability in the eastern parts only began to emerge in the early Principate, to Palmyra's benefit. If part of the Silk-Road, which directions did the road or routes take? Was it a cross-road, a kernel in a network, and if so, how far did the network stretch? To which directions did the roads lead?

Trade was executed along two routes, by land and by sea, with the river as an in-between means connecting sea transport with land routes. For Palmyra, it was the river Euphrates that enabled the city to become the link between the Indian Ocean and the Mediterranean Sea. The foremost source for this route, from the Indian Ocean, via the Euphrates to the Mediterranean ports, is Pliny the Elder, who wrote his *Naturalis Historia* (to be abbreviated as *NH*), a history of the geographical and natural state of the Roman empire, by the time that Palmyra began to flourish. Although its goal was not to describe trade routes, the *NH* still provides very worthwhile information for the question addressed in this paper: was Palmyra part of the Silk Road? The description of Syria, the province of which Palmyra was part, reveals the routes taken by the merchants, 5.27 "Beyond Palmyra, Emesa takes to itself a portion of these deserts; also Elatium, nearer to Petra by one-half than Damascus. At no great distance from Sura is Philiscum, a town of the Parthians, on the Euphrates. From this place it is a ten days' sail to Seleucia, and nearly as many to Babylon". Pliny even continues to sketch the link to the Tigris river, the western access to India.

The Maritime Route
The route to the Mediterranean Sea through Palmyra, however, was not the only one. In chapter 6.101, Pliny sets out to describe the route through Egypt from India: "The age that followed pointed out a shorter route, and a safer one, to those who might happen to sail from the same promontory for Sigerus, a port of India; and for a long time this route was followed, until at last a still shorter cut was

[11] Burgersdijk 2007 for an interpretation of *privata sorte* indicating an independent position and Kaizer 2017, 69 note 27 with references to earlier research.
[12] In response to Xinru Liu 2010, 27. See also Young 2001, 136-186 (chapter 4: 'The Trade of Palmyra').

discovered by a merchant, and the thirst for gain brought India even still nearer to us. At the present day voyages are made to India every year: and companies of archers are carried on board the vessels, as those seas are greatly infested with pirates"[13]. Pliny had described the route taken by the fleet of Alexander the Great, from the island of Patale to Achaemenid Susa, for which his source had been the diaries of Alexander's fleet generals Onesicritus and Nearchus[14]. His additional source, an unnamed merchant, is said to have discovered a shorter route. The text reveals that Pliny heavily depends on the written sources of centuries before his times, supplemented by knowledge from later times, produced by contemporaneous trade[15]. When Pliny speaks of "the age that followed" (*secuta aetas*), he enters into the age styled by Craig Benjamin as the 'First Silk Roads Era'. The route is to India from Egypt through the Arabian Peninsula, which has been shortcut in Pliny's times, although not through Palmyra.

It is precisely this road in this same era (the first two centuries CE) that was described in *The History of the Later Han*: the trade between Rome, Parthia and India at sea, which is reported to have been lucrative[16]. This latter detail corresponds with a remark by Pliny, who reveals the magnitude of the trade's worth: "It will not be amiss too, on the present occasion, to set forth the whole of the route from Egypt, which has been stated to us of late, upon information on which reliance may be placed, and is here published for the first time. The subject is one well worthy of our notice, seeing that in no year does India drain our empire of less than five hundred and fifty million of sesterces, giving back her own wares in exchange, which are sold among us at fully one hundred times their prime cost"[17]. *NH* 12.84, in the book on book on trees (cinnamon and cassia in cap. 84) treats the trade of pearls and perfumes with India, China and Arabia: "... for it is this that furnishes us with pearls. At the very lowest computation, India, the Seres,

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[13] S*ecuta aetas propiorem cursum tutioremque iudicavit, si ab eodem promunturio Sigerum portum Indiae peteret, diuque ita navigatum est, donec conpendia invenit mercator lucroque India admota est: quippe omnibus annis navigatur, sagittariorum cohortibus inpositis; etenim piratae maxime infestabant*; tr. from Pliny the Elder, *The Natural History*, ed. John Bostock *et alii*.

[14] The route from "Syagrus, the Promontory of Arabia, to Patale", in which Syagrus is "Most probably the Cape Ras-el-Bad, the most easterly peninsula of Arabia" (note by Bostock), while Patale or Patala is an island at the mouth of the river Indus, earlier mentioned in 6.23. Syagros has also been identified as the nearby Ras Fartak. All geographical names mentioned in this section can be found on Map 1.

[15] Precisely as Pliny states in the preface to the *Naturalis Historia*, dedicated to the emperor Titus (79-81 CE): he had made use of many sources "and to these I have made considerable additions of things, which were either not known to my predecessors, or which have been lately discovered."

[16] See Fan Ye (398-445) 1965, *Hou Han Shu* ["*History of the Later Han*"], Beijing: Zhonghua Shuju, 88.2919, quoted in Xinru Liu 2010, 132 note 14. See also the translated and annotated edition by Hill 2009 (second edition 2015: *Through the Jade Gate - China to Rome:* Vols. I and II).

[17] *nec pigebit totum cursum ab Aegypto exponere, nunc primum certa notitia patescente: digna res, nullo anno minus HS·|D| imperii nostri exhauriente India et merces remittente, quae apud nos centiplicato veneant.*

and the Arabian Peninsula, withdraw from our empire one hundred million of sesterces every year – so dearly do we pay for our luxury and our women. How large a portion, too, I should like to know, of all these perfumes, really comes to the gods of heaven, and the deities of the shades below?"[18]. Although Arabia does not produce these products, it is still called "happy" (*Felix*) because of the pearls found in the sea. In passing, the products coming from China and India are mentioned, perfumes in case, for the use of veneration of gods and the dead.

The Terrestrial Route

Signposts of commercial trade in Palmyra were Dura-Europos, where a large community of Palmyrene inhabitants resided[19]. Seleucia (present-day Baghdad) on the Tigris was another post from which goods from the river were transferred to the cross-desert route to Palmyra. Also further afield, in Parthian controlled cities as Babylon and Vologesias, the presence of Palmyrene groups was attested. In Palmyra itself, the presence of temples of various religions attest of the continuous presence of ethnically different groups, either (semi-)nomadic or resident. The route is reported to lead from Bactra via Herat and Merv (Alexandria Margiana) to Seleucia on the Tigris, which was supposed to be the focal point of silk-trade in the Hellenistic period. From there, the journey to the river Euphrates was brief, and the Indian Ocean could be reached easily by boat[20].

At the mouth of the Euphrates the city of Charax was situated, to which silk-trade was transferred after the destruction of Seleucia under the Roman emperor Marcus Aurelius. A large contingent of Palmyrene settlers lived in this independent city-state, merchants as well governors. The land-route may have been intermitted between the period of the conquest of the Tarim lands by the Kushans, while the Euphrates route may have been restored by the Roman emperor Trajan's expedition to Mesopotamia. In short, Seleucia on the Tigris in the first half of the second century functioned as the transport center for terrestrial (through Iran) as well as maritime (from the Indian Ocean) transport. The report

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[18] *ex illo* [sc. *Arabiae mare*] *namque margaritas mittit. minimaque computatione miliens centena milia sestertium annis omnibus India et Seres et paeninsula illa imperio nostro adimunt: tanti nobis deliciae et feminae constant. quota enim portio ex illis ad deos, quaeso, iam vel ad inferos pertinet?* See Lytle 2016, 122-124 for comments on Pliny, especially trade in cassia and cinnamon, beyond philological sources and using archaeological evidence (and Ferguson 1978, 589 for cassia and cinnamon). For Pliny's remark on silk as a luxury good and sign of moral decay: Cobb 2018, 184; Trade in luxury goods as reported by Pliny: Mc Laughlin 2018, 125-127. Pearls and luxury goods imported in Rome from the Indian Ocean: Schneider 2018.

[19] For Palmyrans in Dura-Europos, see Dirven 1999; Kaizer 2017 *passim*; Sommer 2018, 141-145. All geographical names mentioned in this section can be found on Map 2.

[20] Stoneman 1992, 41. Stoneman 1992, 44 compares the route with the one made by the Chinese emperor's envoy Kan-Ying, who took the route through An-shi (Parthia) to Aman (Ecbatana) and Ssu-Pin (Ctesiphon). Seleucia as headquarters of silk-trade: 1992, 45. For the journey along the Euphrates, cf. Strabo 16.1.27 and Mayer/Seland 2016 for the inland route from Palmyra to the Euphrates.

by Ammianus, although written more than a century after the destruction of Palmyra, reveals the arrival of caravans from China in Batna, near the river Euphrates (Amm. Marc. 14.3.3): "The town of Batne, founded in Anthemusia in early times by a band of Macedonians, is separated by a short space from the river Euphrates; it is filled with wealthy traders when, at the yearly festival, near the beginning of the month of September, a great crowd of every condition gathers for the fair, to traffic in the commodities sent from India and China, and in other articles that are regularly brought there in great abundance by land and sea"[21]. Although the text dates from a later time, the information may well reveal how caravan trade had functioned in Palmyra, depictions of which are found among the archaeological evidence[22].

Conclusion

Among the merchandise reported at Palmyra, many fragments of silk have been found in the graves of Palmyra, originating from Han China, the oldest fragments to have been excavated in the Mediterranean region. They form part of a larger group of textiles, some five hundred pieces, further consisting of linen (partly produced in Palmyra itself), wool and cotton (partly from India)[23]. Silk textiles were either imported from China, from India, or were produced with yarns on the basis of imported materials. Finds of Middle-Asian scenes on silk fragments suggest that the technology of silk weaving had been expanded over larger production centers in Asia. The scenes depict grapes-harvesting men with two-humped-camels, which for Palmyrene experience must have been outlandish, as in Syria the one-humped camels or dromedaries were used as beasts of burden animals[24].

The discovery of silk fragments at least indicates a long-distance trade of materials, that may have been imported or transferred through Palmyra. The famous Tariff, now in St Petersburg, from 137 showcases a host of materials, such as spices, skins, slaves, animals, jewelry and liquids that were traded in the city.

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[21] Translation taken from J.C. Rolfe, Loeb Classical Library, Ammianus Marcellinus vol. 1 (1935): *Batnae municipium in Anthemusia conditum Macedonum manu priscorum ab Euphrate flumine brevi spatio disparatur, refertum mercatoribus opulentis, ubi annua sollemnitate prope Septembris initium mensis ad nundinas magna promiscuae fortunae convenit multitudo ad commercanda quae Indi mittunt et Seres aliaque plurima vehi terra marique consueta*. For the Chinese trade, see Den Boeft *et alii* 1998, 211-212; the etymology and ethnic identification of Seres, and their occurrence in classical sources: Dihle 1984b and Janvier 1984; Poinsotte 1979.

[22] Seland 2017, 106-114 about the iconography for caravan trade in Palmyra; Seland 2014 for the organisation and Seland 2015 for the routes. Gawlikowski 2016a and b on Palmyra as a caravan city; Seland 2017 with colour illustrations; Kaizer 2015 on Palmyrene trade in general.

[23] Xinru Liu 2016, 28 resp. 30. For the textiles, see Schmidt Colinet 2000 (K240); and their trade and representation in iconography: Finlayson 2002.

[24] A difference in approach may be discerned between Benjamin 2018, 135 (who identifies the silk fragments as produced in China) and Liu (see previous note), who supposes the silks are produced on the basis of Chinese technique in Palmyra itself. Also silk production in India must be taken into account: Cobb 2018, 183-184.

The tariff, detailed in its prescripts, attests of the practice that merchants were taxed for facilities necessary for the transfer of merchandise[25]. Connections with Mediterranean cities, enclaves of Palmyrenes in surrounding cities, as well as the mention of African, Arabian and Asian routes are proof of a dense network of trade contacts. This all leads to the safe conclusion that Palmyra indeed was part of the Silk Road, no matter how it is conceived. The survey, particularly executed on the basis of Pliny the Elder's information about the geographical circumstances, reveals a double access, by sea (the ships entering via the Euphrates) and by land, either from the northern Dura Europos, or from Seleucia on the Tigris. To return to our initial observations, maps should be advised to integrate Palmyra firmly in the Silk Road network, as it may be the most exemplary city for long distance trade, particularly in silk.

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[25] Still standard, also for the reconstruction of eastern trading routes in the second century, is Matthews 1984. Diocletian's *Edict of Maximum prices* is a source for silk production: Hildebrandt 2017, 37-38, in which it is stated that silk workers received a much higher price for their labor than other artisans. See also Cobb 2018, 227. Smith 2013, 161 and 238 note 56 briefly refers to silks trade in relation with other products such as spices and aromatics.

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The editors urge the authors to use the following standards of transliteration from Russian and Greek in their contributions:

Russian:

а – a	к – k	х – kh
б – b	л – l	ц – ts
в – v	м – m	ч – ch
г – g	н – n	ш – sh
д – d	о – o	щ – shch
е – ye/e (*)	п – p	ъ – ' (apostrophe)
ё – yё/ё (*)	р – r	ы – y
ж – zh	с – s	ь – ' (apostrophe)
з – z	т – t	э – e
и – i	у – u	ю – yu
й – i	ф – f	я – ya

(*) ye initially, after vowels, and after ъ and ь; e elsewhere; when written as ё in Russian, transliterate accordingly as yё or ё.

Greek:

A, α – A, a	I, ι – I, i	P, ρ – R, r
B, β – B, b	K, κ – K, k	Σ, σ, ς – S, s
Γ, γ – G, g	Λ, λ – L, l	T, τ – T, t
Δ, δ – D, d	M, μ - M, m	Y, υ – U, u
E, ε – E, e	N, ν – N, n	Φ, φ – F, f (or: Ph/ ph)
Z, ζ – Z, z	Ξ, ξ – X, x	X, χ – Ch, ch
H, η – Ê, ê	O, o – O, o	Ψ, ψ – Ps, ps
Θ, θ – Th, th	Π, π – P, p	Ω, ω – Ô, ô

The spiritus asper is to be rendered as h.