Notes on Barygaza's Trade
Commodities and Coins at an Asian Crossroads

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In the *Periplus Maris Erythraei*, the kingdom of the Kṣaharāta Nahapāna appears as one of the main Asian hubs for long-distance trade.[1] At Ozene (Ujjayinī), which was and would again be the capital of the kingdom, the land routes from both the south (Deccan plateau and Bay of Bengal) and the north (Indus valley, Punjab, and Himālaya) meet.[2] At Barygaza (Bhṛgukaccha/Bharukaccha, Bharuch), at the mouth of the Narmadā River, the sea routes from Egypt, Arabia, West Asia, and South India converge.[3] The merging of these long-distance trade networks broadened the economic horizons of a kingdom suddenly elevated to a pivotal commercial role.

1 The *Periplus Maris Erythraei* was written during the reign of the Nabataean king Malichus II (Peripl. M. Rubr. 19), between 39/40 and 69/70 CE (Wenning 1993, 36). Barygaza was then within the dominion of king Manbanos, whose identification with the Kṣaharāta king Nahapāna has long been established (Boyer 1897) and generally accepted. Since the dates in the inscriptions of Nahapāna cannot refer to the Saka era (Pauli 1986; Cribb 1992), the absolute chronology of his reign cannot be more narrowly approximated than (partly) overlapping the reign of Malichus II.

2 Peripl. M. Rubr. 48: ἔνι δὲ αὐτῆς καὶ ἐξ ἀνατολῆς πόλις λεγομένη Ὀζήνη, ἐν ᾗ καὶ τὰ βασίλεια πρότερον ἦν, ἀφ᾽ ἧς πάντα τὰ πρὸς εὐθηνίαν τῆς χώρας εἰς Βαρύγαζαν καταφέρεται καὶ τὰ πρὸς ἐμπορίαν τὴν ἡμετέραν, ὀνυχίνη λιθία καὶ μουρρίνη καὶ σινδόνες Ἰνδικαὶ καὶ μολόχιναι καὶ ἱκανὸν χυδαῖον ὀθόνιον. κατάγεται δὲ δι᾽ αὐτῆς καὶ ἀπὸ τῶν ἄνω τόπων ἡ διὰ Προκλαΐδος καταφερομένη νάρδος ἡ Καττυβουρίνη καὶ ἡ Πατροπαπίγη καὶ ἡ Καβαλίτη καὶ ἡ διὰ τῆς παρακειμένης Σκυθίας, ὅ τε κόστος καὶ ἡ βδέλλα. "There is in this region towards the east a city called Ozene, the former seat of the royal court, from which everything that contributes to the region's prosperity, including what contributes to trade with us, is brought down to Barygaza: onyx; *murrina*; Indian garments of cotton; garments of molochinon; and a considerable amount of cloth of ordinary quality. Through this region there is also brought down from the upper areas the nard that comes by way of Proklais (the Kattyburine, Patropapige, and Kabalite), the nard that comes through the adjacent part of Skythia, and costus and bdellium" (transl. by L. Casson). At the time of the *Periplus*, the king possibly resided in "Minnagara, metropolis of the region" (Peripl. M. Rubr. 41; for its location, see Casson 1989, 199). By the time of Caṣṭana, the king's residence had gone back to Ujjayinī; see Ptol. *Geog*. 7.1.63.

3 Peripl. M. Rubr. 21; 27; 36; 49; 52–54. On Barygaza, see now also Ghosh 2023.

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However, the circulation of coins of different metals and standards—the old punch-marked coins, the drachmas (Indo-Greek, Western Kṣatrapa, and Sātavāhana), and the Roman *denarii* and *aurei*—could not help but create monetary tensions. This paper aims to show how king Nahapāna and the mercantile communities operating in Barygaza adapted to the peculiarities of a monetary circulation at the intersection of multiple commercial networks.

Trade Networks

While describing the region and trade of Barygaza, the author of the *Periplus* mentions a number of Indian choronyms that are not found in other Greek or Latin texts: Dachinabades (Dakṣiṇāpatha, Southward Road), Ariake (Āryāvarta, Country of the Ārya), Aberia (Ābhīra), Syrastrene (Saurāṣṭra), and Papike (cf. Pāpeyaka < Pāpī? Pāpeya?).[4] For Ariake and Dakṣiṇāpatha, the author is only nebulously conscious of their inland extent;[5] not surprisingly for a periplographic account, only their coastal boundaries are specified: Ariake and the kingdom of Nahapāna begin after Barake (Gulf of Kutch) and end south of Barygaza, where Dachinabades begins.[6] Yet in no other Greek or Latin text can we find a similar emphasis on a geopolitically crucial polarity that has resonated so deeply through time in India's ancient history.[7]

The author of the *Periplus* is not aware that Dakṣiṇāpatha was originally a name for a land route, nor is he aware of any choronymical or hodonymical projection of its reverse, Uttarāpatha (Northward Road). Despite their morphological parallelism, Uttarāpatha and Dakṣiṇāpatha are not geographically or historically related. Pāṇini's Uttarapatha is the "Royal Road" from Pāṭaliputra to the Indus River referred to by

4 Peripl. M. Rubr. 41; 43. Saurāṣṭras, Avantis, Ābhīras, Śūras, Arbudas, and Mālavas are associated in *Bhāgavat Purāṇa* 12.1.36; see Mitra 1951. For *Pāpeyaka* horses, see *Arthaśāstra* 2.30.29. A delimitation of Āryāvarta is in Baudhāyana, *Dharmasūtra* 1.1.2.9: "west of Ādarśa, east of Kālaka forest, south of Himālaya, north of Pāriyātra, this is Āryāvarta. The practice in this land is the authentic one." For the location of Ādarśa (where Sarasvatī River loses itself), Kālaka forest (near Allahabad), and Pāriyātra (western part of the Vindhya) and, in general, the notion of Āryāvarta over time, see Mitra Shastri 1969, 45.

5 Peripl. M. Rubr. 50. The generally accepted correction μέχρι τοῦ Γάγγου (Stuck) is better avoided. The manuscript's reading μέχρι τοῦ σύνεγγυς reflects the lack of knowledge of the lands beyond Tagara and should be kept: De Romanis 2020–2021.

6 Peripl. M. Rubr. 41; 50.

7 It reemerges, for example, in the Allahabad inscription of Samudragupta: *Corpus Inscriptionum Indicarum* 3.1, ll. 20–21.

Megasthenes.[8] Whether the term Dakṣiṇāpatha is as old is uncertain.[9] In any case, Dakṣiṇāpatha did not start at Pāṭaliputra or at any other stop along the Royal Road to the Indus.[10] The combination of several clues—three passages from the *Periplus*,[11] the Pāli copulative compound *Avantidakkhiṇāpatha*,[12] a passage of the *Mahābhārata*,[13] and a definition by Rājaśekhara[14]—strongly suggests that Dakṣiṇāpatha originally referred to the road that started from Ujjayinī, touched Paithana (Pratiṣṭhāna, Paithan) and Tagara (Ter), and reached the Bay of Bengal.[15]

8 Pāṇini 5.1.77; Strabo 15.1.11 (= *FGrHist* 715 F 6c); Plin. *NH* 6.62–63.

9 For Dakṣiṇāpatha in the Sātavāhana inscriptions, see below n. 24. The occurrence in *Arthaśāstra* 7.12.22–24 (see below) shows that the notion was already known to the "teachers" (*ācāryāḥ*), but their chronology and that of "Kauṭilya" are difficult to determine.

10 The textual evidence regarding Dakṣiṇāpatha is reviewed by Mitra Shastri 1969, 47; Lahiri 1992, 381–387; Chakrabarti 2005, 1–18; and Neelis 2011, 205–217. However, the claim that Dakṣiṇāpatha connected the Gaṅgā-Yamunā valley with the west coast via the Deccan plateau is incorrect.

11 Peripl. M. Rubr. 48, quoted above n. 2; 50: μετὰ δὲ Βαρύγαζαν εὐθέως ἡ συναφὴς ἤπειρος ἐκ τοῦ βορέου εἰς τὸν νότον παρεκτείνει· διὸ καὶ Δαχιναβάδης καλεῖται ἡ χώρα·δάχανος γὰρ καλεῖται ὁ νότος τῇ αὐτῶν γλώσσῃ, "After Barygaza, the adjoining continent extends in a straight line from north to south. For this reason, the region is called Dachinabades. *Dachanos* is 'south' in their language"; 51: τῶν δὲ ἐν αὐτῇ τῇ Δαχιναβάδει δύο ἐστὶν τὰ διασημότατα ἐμπόρια, Παίθανα μὲν ἀπὸ Βαρυγάζων ἔχουσα ὁδὸν ἡμερῶν εἴκοσι πρὸς νότον, ἀπὸ <δὲ> ταύτης ὡς ἡμερῶν δέκα πρὸς ἀνατολὴν ἑτέρα πόλις μεγίστη Ταγάρα. κατάγεται δὲ ἐξ αὐτῶν πορείαις ἁμαξῶν καὶ ἀνοδίαις μεγίσταις εἰς τὴν Βαρύγαζαν ἀπὸ μὲν Παιθάνων ὀνυχίνη λιθία πλείστη, ἀπὸ δὲ Ταγάρων ὀθόνιον πολὺ[ν] χυδαῖον καὶ σινδόνων παντοῖα καὶ μολόχινα καί τινα ἄλλα τοπικῶς ἐκεῖ προχωροῦντα φορτία τῶν παραθαλασσίων μερῶν. "Of the trading centers in the region of Dachinabades, two are the most outstanding: Paithana, twenty days' travel to the south from Barygaza; and, from Paithana, about ten days to the east, another very large city, Tagara. From these there is brought to Barygaza, by journeys of wagons and very long roadless tracts, from Paithana large quantities of onyx, and from Tagara large quantities of cloth of ordinary quality, all kinds of cotton garments, garments of molochinon, and certain other merchandise from the coastal parts that finds a market locally there" (transl. by L. Casson, with modifications). The contrast between πορείαι ἁμαξῶν (journeys of wagons) and ἀνοδίαι (roadless tracts) mirrors that between *cakrapatha* (wheel track) and *pādapatha* (footpath) in *Arthaśāstra* 7.12.27, where a *kharoṣṭrapatha* (ass or camel road) is also mentioned: see De Romanis 2012, 333.

12 *Mahāvagga* 5.13.5–6; 12–13; cf. *Avantidakkhiṇāpathaka* in *Cullavagga* 12.1.7–8.

13 *Mahābhārata* 3.58.20–22: *ete gacchanti bahavaḥ panthāno dakṣiṇāpatham/ avantīm ṛkṣavantaṃ ca samatikramya parvatam/eṣa vindhyo mahāśailaḥ payoṣṇī ca samudragā// āśramāś ca maharṣīṇām amī puspaphalānvitāḥ/ eṣa panthā vidarbhāṇām// ayaṃ gacchati kosalān/ ataḥ paraṃ ca deśo 'yaṃ dakṣiṇe dakṣiṇāpathaḥ//*, "These many roads lead to Dakṣiṇāpatha, passing by Avanti and the Rikṣavat mountains. This is Vindhya, the mighty mountain and Payoṣṇī River running to the Ocean, and these are the hermitages of the great ascetics, with various flowers and fruits. This is the road of the Vidarbhas—and that goes to the Kosalas. From there and beyond, that land to the south is Dakṣiṇāpatha."

14 Rajaśekhara, *Kāvyamīmāṃsā* 93: *māhiṣmatyāḥ parato dakṣiṇāpatha,* "south of Māhiṣmati is *Dakṣiṇāpatha*."

15 The connections of Tagara with the Bay of Bengal are proved by the φορτία τῶν παραθαλασσίων μερῶν (Peripl. M. Rubr. 51) conveyed there. For the geographical and archaeological evidence concerning this trade route, see Chakrabarti 2005, 109–110; 117–119.

The hodonym Dakṣiṇāpatha (Southward Road) is a contrastive denomination that arose as a result of trade. In particular, it was generated by the southward trade voyages of the Dakṣiṇāpatha merchants.[16] A passage in the *Arthaśāstra* compares the commercial expediency of Dakṣiṇāpatha and the Himālayan Road (*Haimavata*).[17] It is self-evident that debating the advantages and disadvantages of these two trade routes made sense only in a context where they were actually alternative options. Quite appropriately, the author uses the word *Haimavata* (sc. *patha*) here. He avoids *Uttarāpatha*, because Dakṣiṇāpatha and Uttarāpatha did not share a terminal, nor did they ever intersect. The only place where traders from Himālaya and Dakṣiṇāpatha met was at Ujjayinī, which was not crossed by Uttarāpatha.[18] The Himālayan Road in the *Arthaśāstra* can be compared to the two routes for acquiring nard (a high-altitude vegetable typical of the Himālayan regions) outlined in the *Periplus*.[19] The first route (through Proklais) is probably reflected in the sequence of peoples "living behind" Barygaza—Aratrioi, Arachosioi, Gandaraioi, and the people of Proklais, where Alexandria Bucephalos lay;[20] the second (through Skythia) reached at some point along the Upper Indus valley. In any case, none of the Ujjayinī "Nard Roads" alluded to in the *Periplus* passed by the Gaṅgā-Yamunā confluence or by Mathurā. In other words, they did not join the Uttarāpatha.

In conclusion, it seems very likely that the hodonym Dakṣiṇāpatha was a creation of the mercantile communities based in Ujjayinī; that these same communities used to compare pros and cons of the Himālayan and Deccanese trade routes; and that the author of *Arthaśāstra* 7.12.22–24 reflects their debates.

Incidentally, it is worth noting that familiarity with the Ujjayinī area, the Himālayan regions, and Dakṣiṇāpatha is also suggested by *Arthaśāstra* 2.24.5, which records the pluviometry of Aśmaka (western Deccan), Avanti (Ujjayinī region), Aparānta (Konkan coast), and Haimanya (Himālaya).[21] Furthermore, the statements,

16 Dakṣiṇāpatha merchants (*Dakkhiṇāpathakā vāṇijā*) are mentioned in *Cullavagga* 1.18.3.

17 *Arthaśāstra* 7.12.22–24, quoted below.

18 Peripl. M. Rubr. 48, quoted above n. 2.

19 Ibid. The Nardostachys jatamansi is today reported in Himālayan regions between 3,600 and 4,800 meters above sea level (Olsen 2005).

20 Peripl. M. Rubr. 47: ἐπίκειται δὲ κατὰ <νώ>του τῇ Βαρυγάζῃ μεσόγεια πλείονα ἔθνη, τό τε τῶν Ἀρατρίων καὶ <Ἀ>ραχουσ<ί>ων, καὶ Γανδαραίων, καὶ τῆς Προκλ<α>ΐδος, ἐν οἷς ἡ Βουκέφαλος Ἀλεξάνδρεια. Aratrioi correspond to Sanskrit Āraṭṭas, from where excellent horses are exported: see *Arthaśāstra* 2.30.29. Baudhāyana, *Śrautasūtra* 18.13.1 mentions Āraṭṭas together with Gāndhāras, Sauvīras, Karaskaras, and Kaliṅgas.

21 *Arthaśāstra* 2.24.5: *ṣoḍaśa.droṇaṃ jāṅgalānāṃ varṣa.pramāṇam, adhyardham ānūpānāṃ deśa. vāpānām, ardha.trayodaśa^aśmakānām, trayoviṃśatir avantīnām, amitam apara.antānāṃ haimanyānāṃ ca, kulyā.āvāpānāṃ ca kālataḥ*. "The amount of rainfall in dry regions is 16 Droṇas and in wet regions, one and a half times that—regions where sowing is carried out according to the zone. The amount of rainfall in the Aśmaka region is 13 and a half Droṇas; in the Avanti region,

in *Arthaśāstra* 2.20.41-42, that the shadows are absent at noon in the month of Āṣāḍha and increase for six months before decreasing for the other six months pertain to a location along the Tropic of Cancer, near which Ujjayinī lies.[22] Therefore, if *Arthaśāstra* Book 2 and *Arthaśāstra* Book 7 were written by two different authors,[23] they did not come from different regions of India.

In the eyes of the author of the *Periplus*, Dachinabades did not designate a road but a vast region south of the Narmadā. The development of the Dakṣiṇāpatha concept depended in part on the ramifications of the regional road system and in part on the self-representations of the Sātavāhana rulers, who sometimes styled themselves as king(s) of Ṛṣika, Aśmaka, Mūlaka, Surāṣṭra, Kukura, Aparānta, Anūpa, Vidarbha, Ākara, and Avanti, and sometimes as "Lords of Dakṣiṇāpatha" (*Dakṣiṇāpathapati* or *Dakṣiṇāpatheśvara*).[24] Herein lies another difference with Uttarāpatha: no Indian ruler has ever claimed to be "Lord of Uttarāpatha." On the contrary, in several epigraphic and literary texts, Uttarāpatha refers to northern powers that had been terrorised, embattled, or conquered by the eulogised king.[25] Unanchored to any particular region, the term *Uttarāpatha* was used to evoke any place of northern otherness, whereas Dakṣiṇāpatha was the proudly claimed home of the Sātavāhana.

23 Droṇas; and in the Aparānta region, as also in the snowy regions, an unlimited amount—unlimited in terms of time also in lands where sowing is carried out with irrigation" (transl. by P. Olivelle). The low rainfall suggests the western Deccan along the Southward Road as the location of Aśmaka; Avanti is the Ujjayinī region; Aparānta designates the Konkan coast; Haimanya is Himālaya. For Aśmaka, Aparānta, and Avanti as parts of the dominion of Gautamīputra Śrī Sātakarṇi, see below n. 24.

22 *Arthaśāstra* 2.20.41-42: *āṣāḍhe māsi naṣṭac.chāyo madhya.ahno bhavati // ataḥ paraṃ śrāvaṇa.ādīnāṃ ṣaṇ.māsānāṃ dvy.aṅgula.uttarā māgha.ādīnāṃ dvy.aṅgula.avarā chāyā iti //* "In the month of Āṣāḍha (June–July), the shadow disappears at midday. Thereafter, the shadow increases by two *aṅgula* a month during the six months beginning with Śrāvaṇa (July–August), and decreases by two *aṅgula* a month during the six months beginning with Māgha (January–February)" (transl. by P. Olivelle). See Willis 2009, 23–35; Olivelle 2013, 37. The latitude of Ujjayinī is fixed at 22°30' in Āryabhaṭa, *Āryabhaṭīya* 4.14.

23 Trautmann 1971, 114–122. On the compositional history, chronology, and authorship of the work, see Olivelle 2013, 6–38 and bibliography cited therein.

24 *Dakhinā[patha]pa[tino]* in Lüders 1912, 1112 = Mirashi 1981, n. 3 = Tsukamoto 1996, Nanaghat 1, l.2; *Dakhiṇapa]thesaro* in Lüders 1912, 1123 = Mirashi 1981, n. 18 = Tsukamoto 1996, Nasik 4, l.11, dated at the nineteenth year of Vāsiṣṭhīputra Śrī Puḷumavi; in the same inscription (l.2), Gautamīputra Śrī Sātakarṇi is labeled *asika-asaka-muḷaka-suraṭha-kukurāparaṃta-anupa-vidabhākarāvantirāja;* see Quagliotti 1982, 77–81.

25 The texts are reviewed by Neelis 2011, 191–192.

Commodities

The *Arthaśāstra* provides a list of high-value commodities imported from the Himālayan route and Dakṣiṇāpatha: "In the case of a land route also, 'Better than Dakṣiṇāpatha is the Himālayan route, with merchandise of greater value consisting of elephants, horses, perfumes, ivory, antelope skins, silver, and gold,' say the teachers. 'No,' says Kauṭilya. 'The same merchandise with the exception of blankets, antelope skin, and horses, and also merchandise consisting of conch shells, diamonds, gems, pearls, and gold is more abundant in Dakṣiṇāpatha.'"[26] (transl. P. Olivelle, with modifications)

Some of the commodities listed also appear among the items exported from Barygaza to Egypt at the time of the *Periplus*: "From these places are exported: nard, costus, bdellium, ivory, onyx, …, lykion, clothing of all kinds (Chinese and mallow included), yarn, long pepper, and items brought here from the trading centres."[27]

Among the goods travelling along the Himālayan route, the entry *danta* (ivory) in the *Arthaśāstra* corresponds to that ἐλέφας in the *Periplus,* whereas *gandha* (perfume) certainly includes nard, costus, and bdellium.[28] As for the commodities specifically coming from Dakṣiṇāpatha, the tag *maṇi* (precious stone), which certainly includes onyx,[29] is paired with *vajra* (diamonds) and *muktā* (pearls).[30] In contrast, the *Periplus* lists diamonds, pearls, all kinds of transparent gems, and jacinth as commodities available not in Barygaza but in the Limyrike trading centres.[31] The discrepancy is striking but, perhaps, not inexplicable. As extremely high-value and easily transported commodities, items such as pearls, gemstones, and diamonds would likely be traded in the most thriving trading centres, rather than the nearest. As a result, their main markets may have changed over time due to external circumstances. At the time of the

26 *Arthaśāstra* 7.12.22–24: *sthalapathe'pi "haimavato dakṣiṇāpathācchreyān, hastyaśvagandhadantāji narūpyasuvarṇapaṇyāḥ sāravattarāḥ" ityācāryāḥ // neti kauṭilyaḥ // kambalaajināśvapaṇyavarjāḥ śa ṅkhavajramaṇimuktāsuvarṇapaṇyāś ca prabhūtatarā dakṣiṇāpathe.//*

27 Peripl. M. Rubr. 49: φέρεται δὲ ἀπὸ τῶν τόπων νάρδος, κόστος, βδέλλα, ἐλέφας, ὀνυχίνη λιθία καὶ †σμύρνα καὶ λύκιον καὶ ὀθόνιον παντοῖον καὶ Σηρικὸν καὶ μολόχινον καὶ νῆμα καὶ πέπερ<ι> μακρὸν καὶ τὰ ἀπὸ τῶν ἐμπορίων φερόμενα.

28 Peripl. M. Rubr. 48. It is uncertain whether *gandha* includes also lykion and long pepper.

29 Peripl. M. Rubr. 51: κατάγεται […] εἰς τὴν Βαρύγαζαν ἀπὸ μὲν Παιθάνων ὀνυχίνη λιθία πλείστη. Onyx's plentiful production in Paithana and easy availability in Barygaza are emphasized also in consideration of Roman fondness for high-quality cameos. The production of cameos during the Julio-Claudian period stands out both for its quality and quantity (Megow 1987).

30 Several adjectives distinguishing the types of pearls in *Arthaśāstra* 2.11.2 suggest an origin from the Gulf of Mannar or the Cūṛṇī River in Kerala: see De Romanis 1982/7, 189–190; Olivelle 2020, 33–34. For the pearl fisheries at Kor̲kai, see *Akanānūru* 130, 8–11; 201, 1–7; *Maturaikkañci* 135–138. It is difficult to pinpoint the origins of the diamonds in *Arthaśāstra* 2.11.37: see Olivelle 2020, 35.

31 Peripl. M. Rubr. 56. At Pattanam, unfinished gemstones and cameos have been found (Cherian and Menon 2014, 73–75).

Periplus, pearl and gemstone traders may have been attracted to the Limyrike trading centres because the Western merchants operating there were much better funded than their colleagues in Barygaza. The pearls and diamonds traded along Dakṣiṇāpatha at the time of the *Artaśāstra* were probably intended primarily for Indian buyers.

Understandably, the list of goods in the *Periplus* does not include elephants, horses, blankets, and skins, which are mentioned in the *Arthaśāstra* as goods of the Himālayan Road;[32] nor are conch shells (*śaṅkha*) explicitly mentioned among the goods from the Southward Road.[33] Given their ubiquity and relatively low value, it comes as no surprise that the *Arthaśāstra* omits any mention of Indian cotton, mallow textiles, and yarn. The author of the *Periplus* emphasises the importance of cotton cultivation in Ariake and points out the large quantities of textiles coming from urban centres such as Minnagara (in Ariake) and Tagara (in Dachinabades).[34] Additional evidence for cotton cultivation, production, and trade comes in the form of the taxes in cotton (*kapāsa*) paid in the Sarvatobhadra district (Chandankheda) in the thirtieth year of Sātakaṇṇi,[35] the perpetual loans granted to a guild of weavers (*kolīkanikāya*) from Govardhana (Nasik),[36] and finds of Indian cotton in the port town of Berenike, in Egypt.[37] Although the *Periplus* list includes Chinese silk (ὀθόνιον — Σηρικὸν) among the goods available at Barygaza, and "China cloth coming from China" appears in a passage on textiles in *Arthaśāstra*'s Book 2,[38] Chinese silk is conspicuously absent from the goods of the Himālayan route in *Arthaśāstra*'s Book 7.

As a major hub for maritime trade, Barygaza also had "items brought (t)here from (other) trading centres" available.[39] The *Periplus* is alluding here not so much to imports from the local trade centres of the Konkan coast as to imports from the Arab–Persian Gulf and Limyrike.[40] The fact that these items are not explicitly mentioned in the list

32 The provenances of elephants and horses are specified at *Arthaśāstra* 2.2.15–16 and 2.30.29, respectively (see Olivelle 2020, 41–42). While horses come all from northwestern regions, only elephants of the lowest quality come from regions (*Pañcanada*) along the Himālayan Road. The *Periplus* lists 'Chinese' skins (Σιρικὰ δέρματα) among the commodities available at Barbarikon (Peripl. M. Rubr. 39).

33 They may have been among the merchandise from the coastal parts traded in Tagara; see Peripl. M. Rubr. 51: […] καί τινα ἄλλα τοπικῶς ἐκεῖ προχωροῦντα φορτία τῶν παραθαλασσίων μερῶν.

34 Peripl. M. Rubr. 41; 51.

35 Falk 2009, 198–200. As noted by Falk, the date of the inscription recommends the identification of king *sātakaṃṇi* with Nagānika's husband, the only Sātakarṇi who, according to the *Purāṇa,* reigned for (more than) thirty years.

36 Lüders 1912, no. 1133 = Mirashi 1981, n. 38 = Tsukamoto 1996, Nasik 12, l.2. See Ray 2018, 302–303.

37 Sidebotham 2011, 243–244; Wild and Wild 2018.

38 *Arthaśāstra* 2.11.114: *tayā kauśeyaṃ cīnapaṭṭāśca cīnabhūmijā vyākhyātāḥ*.

39 Peripl. M. Rubr. 49, quoted above n. 27.

40 The items imported from the Arab-Persian Gulf are specified at Peripl. M. Rubr. 36: εἰσφέρεται δὲ ἀπὸ ἑκατέρων τῶν ἐμπορίων εἵς τε Βαρύγαζαν καὶ εἰς Ἀραβίαν πινικὸν πολὺ μὲν χεῖρον δὲ τοῦ

of the goods imported into Egypt suggests that their availability in Barygaza was more limited and their prices higher than in the trading centres of the regions of production.

In addition to items for the Egyptian markets, the Western merchants trading in Barygaza could buy commodities to be exchanged while calling at the northeastern African *emporia* on the return journey: grain, rice, ghee, sesame oil, and sugar to be bartered in the trading centres along the Somali coast;[41] Indian iron, steel, and lac dye to be traded in Adulis.[42] Finally, copper, teakwood, beams, yards, and logs of sissoo and ebony (materials for the shipbuilding industry?) were also imported from Barygaza to the *emporia* of the Arab–Persian Gulf.[43]

The *Periplus* list of Western commodities sent to Barygaza includes wine (from Italy, Laodicea in Syria, and Arabia), metals (copper, tin, and lead), coral, chrysolite (peridot?), clothing, multicoloured girdles one cubit wide, styrax, yellow sweet clover, raw glass, realgar, sulphide of antimony, gold and silver *denarii* (which commanded a profitable exchange with local currency), and unguent, although inexpensive and in limited quantity.[44] A separate list itemizes the commodities that were then loaded (as gifts?) for the king: expensive silverware, musicians, beautiful girls for concubinage, excellent wine, valuable simple clothing, and superior unguent.[45]

Ἰνδικοῦ καὶ πορφύρα καὶ ἱματισμὸς ἐντόπιος καὶ οἶνος καὶ φοῖνιξ πολὺς καὶ χρυσὸς καὶ σώματα. "Both ports of trade [sc. Apologos and Omana] export to Barygaza and Arabia pearls in quantity but inferior to the Indian; purple cloth; native clothing; wine; dates in quantity; gold; slaves" (transl. By L. Casson). Trade with Suppara, Kalliena and Semylla is implied by their classification as 'local trading centres' (Peripl. M. Rubr. 52–53), but the goods exchanged are not specified. Nor are the commodities exchanged between Ariake and Muziris (Peripl. M. Rubr. 54).

41 Peripl. M. Rubr. 14: ἐξαρτίζεται δὲ συνήθως καὶ ἀπὸ τῶν ἔσω τόπων τῆς Ἀριακῆς καὶ Βαρυγάζων εἰς τὰ αὐτὰ τὰ τοῦ πέρα<ν> ἐμπόρια γένη προχωροῦντα ἀπὸ τῶν τόπων, σῖτος καὶ ὄρυζα καὶ βούτυρον καὶ ἔλαιον σησάμινον καὶ ὀθόνιον, ἥ τε μοναχὴ[ν] καὶ ἡ σαγματογήνη, καὶ περιζώματα καὶ μέλι τὸ καλάμινον τὸ λεγόμενον σάκχαρι. At Peripl. M. Rubr. 41, India is said to be a great producer of grain, rice, sesame oil, ghee, and cotton.

42 Peripl. M. Rubr. 6: ὁμοίως δὲ καὶ ἀπὸ τῶν ἔσω τόπων τῆς Ἀριακῆς σίδηρος Ἰνδικὸς καὶ στόμωμα καὶ ὀθόνιον Ἰνδικὸν τὸ πλατύτερον ἡ λεγομένη μοναχὴ καὶ σαγματογῆναι καὶ περιζώματα καὶ γαυνάκαι καὶ μολόχινα καὶ σινδόναι ὀλίγαι καὶ λάκκος χρωμάτινος. The entry "clothing of all kinds" at Peripl. M. Rubr. 49 was probably comprehensive of μοναχὴ, σαγματογῆναι, περιζώματα, γαυνάκαι, μολόχινα, and σινδόναι, which therefore were exported to Egypt as well.

43 Peripl. M. Rubr. 36: ἐξαρτίζεται δὲ εἰς αὐτὴν συνήθως, ἀπὸ μὲν Βαρυγάζων εἰς ἀμφότερα ταῦτα τῆς Περσίδος ἐμπόρια πλοῖα μεγάλα χαλκοῦ καὶ ξύλων σαγαλίνων καὶ δοκῶν καὶ κεράτων καὶ φαλάγγων σησαμίνων καὶ ἐβενίνων.

44 Peripl. M. Rubr. 49: προχωρεῖ δὲ εἰς τὸ ἐμπόριον οἶνος προηγουμένως Ἰταλικὸς καὶ Λαοδικηνὸς καὶ Ἀραβικὸς καὶ χαλκὸς καὶ κασσίτερος καὶ μόλυβος, κοράλλιον καὶ χρυσόλιθον, ἱματισμὸς ἁπλοῦς καὶ νόθος παντοῖος, πολύμιται ζῶναι πηχυαῖαι, στύραξ, μελίλωτον, ὕελος ἀργή, σανδαράκη, στῖμι, δηνάριον χρυσοῦν καὶ ἀργυροῦν, ἔχον ἀλλαγὴν καὶ ἐπικέρδειάν τινα πρὸς τὸ ἐντόπιον νόμισμα, μύρον οὐ βαρύτιμον οὐδὲ πολύ.

45 Ibid.: τῷ δὲ βασιλεῖ κατ᾽ ἐκείνους τοὺς καιροὺς εἰσφερόμενα βαρύτιμα ἀργυρώματα καὶ μουσικὰ καὶ παρθένοι εὐειδεῖς πρὸς παλλακείαν καὶ διάφορος οἶνος καὶ ἱματισμὸς ἁπλοῦς πολυτελὴς καὶ

Most items exported from Egypt to Barygaza are also found among the goods exported from Egypt to Barbarikon, Limyrike, or both. Among the commodities exported to all three trading centres is money. However, in the lists of Barbarikon and Limyrike, the author uses the generic term *χρῆμα/χρήματα (money)*; in the list of Barygaza, he refers explicitly to *aurei and denarii*, which can be exchanged at some profit for local currency (δηνάριον χρυσοῦν καὶ ἀργυροῦν, ἔχον ἀλλαγὴν καὶ ἐπικέρδειάν τινα πρὸς τὸ ἐντόπιον νόμισμα).[46]

Coins

At the time of the *Periplus*, the export of Roman coins was a part of Roman commerce with almost every trading centre on the *Erythrà Thálassa*.[47] Moreover, the hoards found in India show that the practice was not limited to the first century CE. The phenomenon has been seen either as a routine course of action to acquire foreign goods[48] or else as a temporary and exceptional consequence of adjustments in the Roman monetary system. According to the latter view, while in other periods trade would have been conducted without coins, after Nero's (or Vespasian's or Trajan's) reform, older and heavier *denarii* and *aurei* would have been exported to offset the loss caused by the devaluation of the new issues.[49]

This approach, especially advocated by D. MacDowall, postulates a rigid chronology for the export of certain types. In particular, the pre-64 CE Julio-Claudian–*denarii* and *aurei* (which, in terms of value, represent about sixty-six percent of all the Roman coins from Augustus to Caracalla found in India) would all have been exported after Nero's reform, whereas Republican *denarii* would have been exported later, only after Trajan's reform (100 CE).

In arguing for his theory, MacDowall makes some good points. For example, he is certainly correct in pointing out that the absence of a large number of shared die links invalidates Bolin's theory that Roman merchants were supplied with coins

μύρον ἔξοχον. Similar appendixes of commodities to be exported "for the king (and the *tyrannos*)" are at Peripl. M. Rubr. 6 (Adulis); 24 (Muza); 28 (Cane).

46 Peripl. M. Rubr. 49, quote above n. 44. It is worth noting the contrast between the importation of aurei from Egypt and the importation of raw gold from the Persian Gulf (Peripl. M. Rubr. 36, quoted above, n. 40). Of all the goods listed, only coral is mentioned in the *Arthaśāstra* as a precious western (*alakandaka,* "Alexandrian") commodity (*Arthaśāstra* 2.11.42).

47 Apart from Barbarikon, Barygaza, and Limyrike, export of money is recorded (or hinted at) in the *emporia* of Adulis, Malao, Mundu, Mosyllon, the Emporion of the Aromata, Opone, Muza, Cane, and Coromandel Coast (Peripl. M. Rubr. 6; 8–10; 12–13; 24; 28).

48 E.g., Cobb 2018, 269–271.

49 MacDowall 1991, 1996, and 2002; Howgego 1995, 104.

directly from the mint.[50] MacDowall is also correct in asserting that Roman coins were carefully selected before export, and in concluding that the marked preference for certain coin types (the Augustan CL CAESARES and the Tiberian PONTIF MAXIM), as well as the absence of post-64 CE *denarii*, shows that the metallic content was a decisive factor in determining which coins were to be exported. Most importantly, it can be positively demonstrated that some coins issued long before Nero were exported only after his reform. A Vespasian countermark on an Augustan *denarius* from the Budinathan hoard (nearly 1,400 *denarii* of Augustus and Tiberius) shows that this coin—minted between 2 BCE and 14 CE—was indeed exported to India only after 69 CE.[51] It is also possible, but not certain, that the nine Republican *denarii* from the Eyyal hoard, buried together with twelve *aurei* Tiberius to Trajan and fifty-one Julio-Claudian *denarii*, were exported after Trajan's reform, as MacDowall suggests.

Still, none of these finds and conjectures proves that it was the monetary reforms of Nero and Trajan that triggered the export of Roman coins to India. The Augustan *denarius* from the Budinathan hoard was definitely exported *after* Nero's monetary reform, but not only *because* of it. MacDowall's assumption that Roman coins were exported only after major monetary reforms (with the implication that no coin was exported before 64 CE) is at odds with famous passages in Pliny and Tacitus, which we have no reason to take as anachronistic projections, showing that the export of Roman coins preceded Nero's reform.[52] And even if the *Periplus* was indeed written between 64 and 70 CE (which is far from certain), it is difficult to imagine the flow of coins it describes replacing a supposedly decades-long coinless trade.

To understand the selection process of the Roman coins sent to India, we have to consider how Indian Ocean commodities were marketed within the Roman Empire. The loan agreement of the Muziris papyrus makes it clear that Indian cargoes were mostly sold in Alexandria. From there, they were redistributed all around the Mediterranean, but especially to Puteoli, the drop-off point for goods destined for the western part of the Roman Empire. It is, therefore, clear that *aurei* and *denarii* destined for India were selected from the *aurei* and *denarii* circulating in Alexandria, which, in turn, was fed primarily by the *aurei* and *denarii* circulating in central Italy. Since the price of Indian commodities rose exponentially as they moved from India to Alexandria and from Alexandria to Puteoli, the money sent to India each year represented only a fraction of the annual profits of the Alexandrian merchants and an even smaller fraction of the annual profits of the Puteoli merchants. Therefore, the CL CAESARES and PONTIF MAXIM *denarii* and *aurei* were preferred for

50 Bolin 1958, 73.
51 Berghaus 1988, 126.
52 Plin. *NH* 6.85; Tac. *Ann.* 3.53.

export, at first because they were the newest and heaviest *denarii* available, then eventually because, in addition to being the heaviest, they had become familiar to Indian traders. As a result, these coins were stockpiled by the elites who financed the India trade well before 64 CE (they are very rare in the small hoards found in the Vesuvian area) and continued to be exported for as long as they were available. The monetary gains made by Alexandrian merchants exceeded the sums they sent to India to purchase Indian commodities, so it is not surprising that a *denarius* minted between 2 BCE and 14 CE could wait several decades before being exported from Alexandria to Muziris.

Roman coins meant different things in different Indian Ocean trading centres, not so much because the flow was quantitatively uneven[53] but because each trading centre presented a distinctive economic context. In Adulis, for example, the coins were used to pay foreign middlemen who lived there, while the local population used pieces of brass as currency (ἀντὶ νομίσματος).[54] As for India, Pausanias claims that, according to merchants who sailed there, the Indians exchanged goods for Greek wares and knew nothing of money (νόμισμα δὲ οὐκ ἐπίστασθαι).[55] These two assertions by Pausanias should be handled cautiously. While the statement that the Indians gave goods in exchange for Greek wares may be correct, the claim that they knew nothing of money is certainly inaccurate when extended to the whole of India.

Literary and archaeological evidence abundantly proves that money was known in several first-century-CE Indian trading centres, and Roman coins were certainly used also (not only, but also) as money. For the southern part of the subcontinent, for example, the *Periplus* remarks that the money exported from Egypt circulated in the Coromandel Coast; since the Coromandel Coast was not usually visited by western ships, it follows that the Roman coins were brought there by Indian traders.[56]

The familiarity with money is particularly evident in Barygaza, where Roman coins merged into a complex monetary circulation system. The *Arthaśāstra* passage quoted above includes silver coinage (*rūpya*) and (raw?) gold (*suvarṇa*) among the goods coming via the Himālayan Road, and (raw?) gold (*suvarṇa*) among the goods coming from the Southward Road. This asymmetry accounts for the abundant circulation of

53 The δηνάριον ὀλίγον exported to Adulis and the δηνάριον οὐ πολύ, καὶ χρυσοῦν δὲ καὶ ἀργυροῦν exported to Malao (Peripl. M. Rubr. 6; 8) were probably only insignificant fractions of the χρήματα πλεῖστα exported to South India.

54 Peripl. M. Rubr. 6: ὠρόχαλκος, ᾧ χρῶνται πρὸς κόσμον καὶ εἰς συγκοπὴν ἀντὶ νομίσματος.

55 Paus. 3.12.4: οἱ δὲ ἐς τὴν Ἰνδικὴν ἐσπλέοντες φορτίων φασὶν Ἑλληνικῶν τοὺς Ἰνδοὺς ἀγώγιμα ἄλλα ἀνταλλάσσεσθαι, νόμισμα δὲ οὐκ ἐπίστασθαι, καὶ ταῦτα χρυσοῦ τε ἀφθόνου καὶ χαλκοῦ παρόντος σφίσι.

56 Peripl. M. Rubr. 60: προχωρεῖ δὲ εἰς τοὺς τόπους τούτους πάντα τὰ εἰς τὴν Λιμυρικὴν ἐργαζόμενα, καὶ σχεδὸν εἰς αὐτοὺς καταντᾷ τό τε χρῆμα τὸ ἀπ᾽ Αἰγύπτου φερόμενον τῷ παντὶ χρόνῳ κα<ὶ> τὰ πλεῖστα γένη πάντων τῶν ἀπὸ Λιμυρικῆς φερομένων <καὶ> διὰ ταύτης τῆς παραλίας ἐπιχορηγουμένων.

Indo-Greek silver drachmas in the regions of north India (confirmed by the *Periplus*, which attests to the circulation of the old drachmas of Apollodotus and Menander in Barygaza[57]) and the absence, or at least the rarity, of the same silver coinage along the Southward Road.

The drachmas of Nahapāna closely followed the Indo-Greek models. They were of the same weight standard and, like them, bore the king's portrait and a legend in Greek script on the obverse. In all likelihood, they had the same nominal value.[58] One difference does deserve to be noted. While the reverse legends of the bilingual Indo-Greek coins use only the Kharoṣṭhī script (most often) or the Brāhmī script (very rarely), the reverse legends of the drachmas of Nahapāna always repeat the same words in both Kharoṣṭhī and Brāhmī. In turn, the use of the double alphabet in the Western Kṣatrapa silver coin reverse legends contrasts the bilingual legends (Prakrit on the obverse and Tamil on the reverse, both in Brāhmī script) found on silver Sātavāhana coins.[59] The two scripts on the reverse of the Western Kṣatrapa coins reflect the bidirectional nature of the Western Kṣatrapa trade network—towards both the Himālayan and the Southward Roads; the use of two languages on Sātavāhana issues shows that their circulation encompassed the entire Dakṣiṇāpatha, from the south bank of the Narmadā to the Bay of Bengal.

As mentioned above, ships from Egypt brought raw copper, tin, and lead—all metals that were used by Nahapāna for low-value coinage.[60] They also carried Roman *aurei* and *denarii*, which were primarily intended to pay for local wares, but at Barygaza they could also be exchanged for local currency (ἐντόπιον νόμισμα) at some profit: δηνάριον χρυσοῦν καὶ ἀργυροῦν, ἔχον ἀλλαγὴν καὶ ἐπικέρδειάν τινα πρὸς τὸ ἐντόπιον νόμισμα. The hypothesis that the local currency exchanged for *aurei* and *denarii* was the small change of Nahapāna is inconsistent with the import from Egypt of copper, tin, and lead; but the alternative hypothesis that it was the silver drachma—either Indo-Greek or of Nahapāna—makes no sense either. Why would Indian traders give away at a loss a currency that was the backbone of the Western Kṣatrapa monetary system?

The curious formulation of the Periplus may be clarified by an inscription engraved in a magnificent *vihāra* in the Pandav Leni near Nasik. Situated near an important centre in the Godāvarī valley, some 200 km up the river from Paithana, the capital

57 Peripl. M. Rubr. 47.

58 The weight standard of the Indo-Greek *drachma* is estimated at 2.45 grams (Hoover 2013, lxxx). The extant drachmas of Nahapāna weigh from 1.9 to 2.3 grams (Fishman 2013, 7).

59 Mahadevan 2003, 199-205; Ollett 2017, 43.

60 Peripl. M. Rubr. 49. The coins of Nahapāna are in silver, copper, copper-lead alloy, potin, and lead (Jha and Rajgor 1994, 86–109).

of the Sātavāhana kingdom, the Buddhist monastery was dedicated by Nahapāna's son-in-law Uṣavadāta in Nahapāna's year 42.[61]

Although the absolute chronology of Nahapāna's reign cannot be more precisely determined than that of the *Periplus*, its relative chronology makes it clear that the gap between the Nasik inscription and the writing of the *Periplus* cannot be more than eighteen years. In fact, as S. Bhandare has pointed out, Nahapāna's overstrikes on the coins of Satavastres and Gautamīputra Śiva Sātakarṇi show that the beginning of the latter's reign preceded the end of the former's reign, whereas the overstrikes on Nahapāna's coins show that different parts of his reign preceded the end of the reigns of Gautamīputra Śiva Sātakarṇi and Gautamīputra Śrī Sātakarṇi. In other words, (a part of) the reign of Nahapāna overlapped with (parts of) the reigns of both Gautamīputra Śiva Sātakarṇi and his successor Gautamīputra Śrī Sātakarṇi.[62]

Furthermore, S. Bandhare has convincingly argued that the Saraganos the Elder mentioned in the *Periplus* should be identified as Gautamīputra Śiva Sātakarṇi, probably a uterine elder brother of Gautamīputra Śrī Sātakarṇi.[63] We can therefore infer that when the *Periplus* was written, sometime between 39/40 and 69/70 CE, Nahapāna was still king, but Saraganos the Elder (Gautamīputra Śiva Sātakarṇi) had been succeeded by Gautamīputra Śrī Sātakarṇi. Since the monastery was dedicated in Nahapāna's year 42, but before Gautamīputra Śrī Sātakarṇi defeated Uṣavadāta and conquered Nasik in Sātakarṇi's year 18,[64] we can conclude that both the *Periplus* and the monastery date from the period between 39/40 and 69/70 CE and that they are separated by less than eighteen years.

One of the inscriptions on the veranda of the *vihāra* recalls, in its first part, the endowments made by Uṣavadāta for the benefits of the hosts of the newly dedicated monastery in Nahapāna's year 42. In what must be an addition in Nahapāna's year 45, the text recalls a remarkable donation to Hindu gods and Brāhmaṇa: "Again, the gift given by him [sc. by Uṣavadāta] formerly in the year 41 [sc. by king Nahapāna], on the fifteenth day of Kārttika, was actually delivered to the holy gods and Brāhmaṇa on the fifteenth day (?) of the year 45: a capital of 2,000 *suvarṇa,* which makes out, as one *suvarṇa* is worth thirty-five (*kārṣāpaṇa*), seventy thousand (70,000) *kārṣāpaṇa*."[65]

61 Nagaraju 1981, 266-268; Nasik is Νασίκα in Ptol., *Geog.* 7.1.63.

62 Bhandare 2006.

63 Bhandare 2006. The elder Saraganos is mentioned in Peripl. M. Rubr. 52.

64 Lüders 1912, 1125 = Mirashi 1981, n. 11 = Tsukamoto 1996, Nasik 2.

65 Lüders 1912, no. 1133 = Mirashi 1981, no. 38 = Tsukamoto 1996, Nasik 12, ll. 4–6: *bhūyo nena dataṃ vase 41 kātikaśudhe panarasa puvāka vase 45 panarasa niyutaṃ bhagavatāṃ devānaṃ brāhmaṇāṃca karṣāpaṇasahasrāṇi satari 70,000 paṃcatriśaka suvarṇa kṛtā dina suvarṇasahasraṇaṃ mūlyaṃ phalakavāre caritratoti*. Senart's translation (1905/1906, 83) suggests that 70,000 *kārṣāpaṇa* was actually given, not 2,000 *suvarṇa*. This is recommended neither by the syntax, as *dataṃ* and *niyutaṃ* refer to *dina suvarṇasahasraṇaṃ mūlyaṃ,* nor by Uṣavadāta's epithet *suvarṇadāna,* in Lüders 1912, no. 1131 = Mirashi 1981, no. 43 = Tsukamoto 1996, Nasik 10, l. 1. Interestingly, the

The added detail that each of the 2,000 (*suvarṇa*) donated to the Hindu gods and Brāhmaṇa is worth thirty-five *kārṣāpaṇa* dwarfs the earlier 3,000 *kārṣāpaṇa* donated to the Buddhist monks of Nasik. The statement confirmed the religious priorities of the ruling family for readers who were familiar with the silver currency *kārṣāpaṇa,* but not with the gold one named *suvarṇa*. Moreover, it must be noted that since the dedicant of the inscription is the son-in-law of Nahapāna, the equivalence 1 *suvarṇa* = 35 *kārṣāpaṇa* must have been the official exchange rate set by the central power. Certainly, a *suvarṇa* is a gold coin and a *kārṣāpaṇa* is a silver coin, but which ones exactly, and which gold-to-silver ratio do they imply? Opinions vary.

E. J. Rapson identified the *suvarṇa* as the Kuṣāṇa gold coin and the *kārṣāpaṇa* as a silver coin of the same weight standard as the drachmas of Apollodotus and Menander, inferring a 1:10 gold-to-silver ratio.[66] For D. R. Bhandarkar, the *suvarṇa* and the *kārṣāpaṇa* were indigenous coins of eighty and thirty-two *rattis*, respectively, positing a gold-to-silver ratio of 1:14.[67] A. S. Altekar interpreted the *suvarṇa* and the *kārṣāpaṇa* as the Kuṣāṇa gold coin and the Nahapāna drachma, respectively, and deduced a gold-to-silver ratio of 1:10.[68] D. W. MacDowall took the *suvarṇa* to be the Roman *aureus* and the *kārṣāpaṇa* the Nahapāna drachma, also concluding that the gold-to-silver ratio was 1:10.[69]

In my view, any interpretation which derives from the Nasik inscription an unequivocal gold-to-silver ratio of 1:10 must also acknowledge the inconsistency with the report in the *Periplus* that Roman *aurei* were exchanged at some profit for local currency at Barygaza. With such a ratio, Roman merchants would never have been able to exchange their gold coins for local silver coins at a profit. They would have been better off just staying home and exchanging *aurei* for pre-64 CE *denarii*. It is no coincidence that the scholars who inferred a 1:10 gold-to-silver ratio and then tried to establish a link between the Nasik inscription and the *Periplus* ended up twisting the meaning of the *Periplus* passage. Altekar, who was the first to realise that the Nasik equivalence had to be reconciled with the information provided by the Greek author, surmised that Roman silver coins could be profitably exchanged for Indian

connection between Barygaza's trade and Nahapāna's religious devotion is emphasised by the Āvaśyaka tradition, which preserves the memory of a conflict between a king Sātavāhana, who resided in Pratiṣṭhāna and was powerful because of his army, and Nahapāna, who resided in Bhṛgukaccha and was powerful because of his treasury. Nahapāna was eventually defeated because he squandered his financial resources on building temples, stupas, ponds, and tanks (Balbir 1993, 60; Ollett 2017, 53 n. 32).

66 Rapson 1908, clxxxiv–clxxxv.

67 Bhandarkar 1921, 191–192.

68 Altekar 1940, 4–5.

69 MacDowall 1996, 92; 2003, 43–44.

gold, even though the text clearly says ἐντόπιον νόμισμα (local currency).[70] MacDowall postulated that only silver *denarii* were exchanged. Roman merchants would have made their profit by exchanging pre-64 CE silver *denarii* struck at the 1:12 gold-to-silver ratio for Nahapāna drachmas issued at the 1:10 ratio.[71] It is difficult to see how a different gold-to-silver ratio would have affected the exchange of silver for silver. In any case, the text says δηνάριον χρυσοῦν καὶ ἀργυροῦν—so both *aurei* and *denarii* were exchanged for local currency. Finally, M. Dutta's gold-to-silver ratio of 1:13 is based on an *aureus* of post-64 CE weight standard (hardly exported to India during Nahapāna's reign) and a drachma of Nahapāna "theoretically" weighing forty-two grains (2.72 grams).[72]

Since the *suvarṇa* can hardly be anything other than the Roman *aureus* of pre-64 standard—the only contemporary gold coin that Uṣavadāta could donate by the thousands[73]—the crucial question is how to interpret the unit of account, *kārṣāpaṇa*. The identification with the drachma of Nahapāna is certainly supported by the large hoard found at Jogalthembi (just twenty kilometres or so from the Pandav Leni of Nasik),[74] but it cannot refer to it *alone*. The theory that a Roman *aureus* was exchanged for thirty-five Nahapāna drachmas is inconsistent with the information in the *Periplus* that *both aurei* and *denarii* were exported and exchanged for local currency at a profit in Barygaza. Exchanging an *aureus* for thirty-five drachmas of Nahapāna would not be profitable for Western merchants, if they could exchange it within the Roman Empire for twenty-five pre-64 CE *denarii*.

On the other hand, the same unit of account, appears in Nāganikā's Nāṇeghāṭ inscription, which records Sātakarṇi's sacrificial fees of 24,400 (plus 6,001 for the attendant), 14,000, and 10,000 *kārṣāpaṇa*. Moreover, it appears again in a Kanheri inscription from the sixteenth year of Gautamīputra Śrīyajña Sātakarṇi (late second century CE), which commemorates a donation of 200 *kārṣāpaṇa* by the merchant Apareṇu.[75]

The correspondence between the unit of account mentioned in the inscriptions and the silver drachmas has been understood in different ways. Rapson postulated that the *kārṣāpaṇas* in the inscriptions always referred to the hemi-drachmas of the

70 Altekar 1940, 4. Schoff's translation (Schoff 1912, 42), to which Altekar refers, runs as "gold and silver coin, on which there is a profit when exchanged for the money of the country."

71 MacDowall 1996, 92; 2003, 43–44; followed by Nappo 2017, 573.

72 Dutta 1990, 222.

73 De Romanis 2006, 70. As we now know, the gold coins of the first known Kuṣāṇa ruler, Vima Kadphises, were minted several decades after the end of Nahapāna's reign. Bopearachchi 2006; 2008, 3–56; Falk 2014.

74 It included ca.13,270 drachmas of Nahapāna, ca. 9,270 of which with Gautamīputra Śrī Sātakarṇi's overstrikes: Scott 1908; Shastri 1995.

75 Gokhale 1991, n. 25, 75–76. A donation of 800 *kāhāpaṇa* is recorded also in an undated inscription of Kanaganahalli; see Nakanishi and von Hinüber 2014, 85.

Greco-Indian princes Apollodotus and Menander.[76] I. K. Sarma has suggested that the Sātavāhana drachma was actually an *ardha-kārṣāpaṇa*—(half-*kārṣāpaṇa*), so that the 200 *kārṣāpaṇa* donated by Apareṇu would correspond to 400 Sātavāhana silver drachmas.[77] Neither view is consistent with the equation set in the Nasik inscription. If the *kārṣāpaṇa* in the Nasik inscription were only Nahapāna drachmas, it is difficult to see how the Roman merchants could profitably exchange one *aureus* for thirty-five *kārṣāpaṇa*. If, on the other hand, a Nahapāna drachma was an *ardha-kārṣāpaṇa,* then the gold-to-silver ratio of 1:20 would make the Nahapāna drachma a severely undervalued currency. Even if the unit of account referred to a theoretical punch-marked coin weighing about 3.4 grams, a 2.2/2.3-gram drachma should have been worth at least two thirds of a *kārṣāpaṇa*.

The persistence of the term *kārṣāpaṇa* as a unit of account over time is all the more remarkable when one considers that the drachmas of Indo-Greek standard (2.3 grams) first joined and then gradually replaced the original *kārṣāpaṇa* (silver punch-marked coins of 3.4 grams). In the Aï-Khanoum treasury, the deposit of different types of silver currency— each seemingly with its own value—was recorded in the mid-second century BCE, with entries distinguishing not only between drachmas and *kasapana* but also between *kasapana* from different geographical areas, such as *kasapana taxaena* and *kasapana nandena*.[78] In contrast, in the northwestern Deccan of the first century CE, the replacement of punch-marked coins by drachmas was not accompanied by a replacement of the old unit of account (*kārṣāpaṇa*) by a new one (*dramma*). The most likely explanation for this stability is that the drachmas of the Indian standard (Indo-Greek, Indo-Scythian, and of Nahapāna) were considered *kārṣāpaṇa* with an inflated face value.[79]

The *kārṣāpaṇa* paid as fees for the Vedic sacrifices recorded in the Nāṇeghaṭ inscription must have been silver punch-marked coins.[80] It is uncertain how many years separate these sacrifices from the beginning of Nahapāna's reign,[81] but it is very likely that the punch-marked coins were still in circulation in the Deccan in the

76 Rapson 1908: clxxxiv–clxxxv.

77 Sarma 1980: 60.

78 Rapin and Grenet 1983, nos. 4a.; 4b; 4c; 5; 7; 8d; Lerner 2011: 111–112 argues unconvincingly that drachmas, *taxaena* and *kasapana taxaena* were equivalent in value: see, rightly, Holt 2012, 168–169. Furthermore, it seems unlikely that both *taxaena* and *kasapana taxaena* were Indo-Greek drachmas. Apollodotus' and Menander's coins are identified as δραχμαί in Peripl. M. Rubr. 47.

79 Hoover 2013, lxxx.

80 Bhandare 1999, 54; *contra* Dutta 1990, 219.

81 The Sātakarṇi eulogized in the Nāṇeghaṭ inscription is probably the one who reigned for fifty years according to the *Purāṇas;* see Pargiter 1913, 39. His reign is dated 12 BCE – 44 CE by Mitra Shastri 1999, 35; 88–42 BCE by Ollett 2017, 189.

mid-first century CE.[82] The simultaneous circulation of worn punch-marked coins and newer but lighter Indian drachmas—both with the official nominal value of one *kārṣāpaṇa*—solves the riddle of the Nasik inscription. The par value of punch-marked coins and Nahapāna drachmas explains why the *aureus* was officially valued at thirty-five *kārṣāpaṇa*, why Western merchants could profitably exchange their *aurei* and *denarii* for local currency, and why Indian merchants agreed to a disadvantageous exchange. Nahapāna set an exchange rate that favoured his drachmas against both punch-marked coins and Roman currency; Western merchants profitably exchanged their *denarii* and *aurei* against undervalued punch-marked coins; and Indian traders agreed to that because exchanging a punch-marked coin with a Nahapāna drachma of 2.3 grams would have been even more damaging.[83]

It is worth repeating: the *kārṣāpaṇa* in the Nāganikā inscription (first century BCE?) referred to punch-marked coins, and the *kārṣāpaṇa* of the Apareṇu inscription (late second century CE) referred to Sātavāhana drachmas. The *kārṣāpaṇa* in the Uṣavadāta inscription referred to *both* old punch-marked coins (since only by exchanging one *aureus* for thirty-five punch-marked coins could the Western merchants have made some profit) and drachmas (since the nominal value of the Nahapāna drachmas, which circulated abundantly in Nasik, must have been one *kārṣāpaṇa*).

What the combined data of the *Periplus*, the Nasik inscription, and the Jogalthembi hoard suggest is that Nahapāna gave his drachmas the same nominal value as the old, worn, but still heavier *kārṣāpaṇa*. In turn, this explains why the Indian traders were ready to exchange their ἐντόπιον νόμισμα "local currency" (and by these words only punch-marked coins were denoted) at a loss, not only for gold *aurei* but also for silver *denarii*.

If the punch-marked coins and the drachmas of Nahapāna had the same nominal value—that is, if the Nahapāna drachmas were overvalued relative to the punch-marked coins—then the dynamics of Gresham's Law ("bad money drives out good") would have provided a very compelling incentive for Indian merchants to use their

82 Bhandare 1999, 55: "The silver punch-marked coins […] continued to be in circulation as seen from the often-encountered groups of extremely worn punch-marked coins. But as their condition worsened, they must have been subjected to a discount, thereby gradually discouraging their use and pushing them out of the circulation."

83 The maximum weight of the circulating punch-marked coins may be inferred from the hoards that were deposited in the region, probably earlier than the reign of Nahapāna. The roughly eighty-seven percent of 2,029 silver punch-marked coins from the Barwani hoard (reportedly, of 3,450 specimens) weighed between 3.5 and 3.2 grams; only ca. 2.5 percent weighed 3.6 grams; ca. 10.5 percent less than 3.1 (Gupta 1992, 14). Of the thirty-five punch-marked coins found at Kasrawad, thirty weighed between 3.5 and 3.1 grams (Diskalkar 1949, 146–153; Errington 2003, 108). In the Iyyal hoard (*terminus post quem* 98 CE), the heaviest of the thirty-four punch-marked coins weighs 2.73 grams, four specimens weigh between 2.5 and 2.2 grams, and the other twenty-nine less than 2.2 grams (Unnithan 1963, 22–28; Gupta 1965).

punch-marked coins in the least harmful way. Exchanging them for Roman coins was less detrimental than exchanging them for Nahapāna drachmas.

In conclusion, three possible factors may have encouraged Indian traders to exchange their currency for Roman coinage in such a way as to generate some profit for the Roman merchants: a gold-to-silver ratio that was more favourable to gold in India than in the Roman Empire; the equal nominal value given to punch-marked coins and drachmas, which devalued the former; and finally, the good reputation that Roman coinage had in India.[84] In what proportion these three factors contributed to the phenomenon alluded to in the *Periplus* is difficult to say. It is easier to point to three possible consequences of the process:

1) Elsewhere in the Indian subcontinent, punch-marked coins were still being hoarded at relatively late periods. They appear along with Kuṣāna coins in the Mir Zakah and Taxila hoards; with Indo-Greek coins in the Kangra, Thatta, and Bairath hoards; and with Roman coins in the south, in the hoards from Mambalam (Chennai), Pennar, Tondamanathan, Kondapur, Nasthullapur, Weepagandla, and Eyyal.[85] In contrast, the punch-marked coins are absent from the large hoards of the Western Kṣatrapa kingdom: none were found in the hoards of Gogha (possibly ca. 5,000 Indo-Greek and Nahapāna silver coins) or Jogalthembi (ca. 13,270 drachmas of Nahapāna).[86] It seems that, by the time these two hoards were deposited, most punch-marked coins had been driven out of the western Deccan.
2) A Tiberian *denarius* found in the Woodham Mortimer (Essex, UK) hoard has an isotopic signature that suggests an Indian origin for its silver.[87] The *denarius* (a *RIC* I² 95, no. 30 type) cannot be dated more precisely within the reign of Tiberius, but several details on its reverse (legs of an ornamented chair; a single line below; a female figure holding a sceptre) occur in specimens whose obverse often depicts a very old emperor,[88] suggesting that it dates from the last years of his reign. If the silver of the Woodham Mortimer

84 In the years of Claudius, the *denarii* exported by the Roman merchants were admired by the Indians for being "equal in weight, although the various figures on them showed that they had been coined by several people" (Plin. *NH* 6.85). Obviously, the old worn pieces were not among them. Equally admired were the select (ἐκλεκτά) *solidi* exported to Taprobane in the sixth century CE: Cosm. Indic. 11.19. On the ancient Indian art of evaluating coins (*rūpasutta,* "science of coinage"), see De Romanis 1988, 31–37. The popularity of Tiberius' coins is also attested by the imitations, in India and in South East Asia, of the image on the reverse of Tiberius' PONTIF MAXIM type (Borell 2014, 7–43).

85 Gupta and Hardaker 2014, 63; Suresh 2004, 163; 167; 169–170.

86 For the Gogha hoard, see Deyell 1984, 115–127; for the Jogalthembi hoard, see above n. 74.

87 Butcher and Ponting 2014, 176–177; 187; 199.

88 Mattingly 1923, cxxx; Sutherland 1987, 219–220; 224.

denarius did come from India, it may have been imported from Barygaza in the form of local currency and used to pay customs duties in Egypt. If silver punch-marked coins did contribute to the issue of *denarii* in the last years of Tiberius, then the import of Indian currency may not have been insignificant during the time between the last years of Tiberius and the writing of the *Periplus*—an interval that may have ranged from a few years up to several decades. Of course, such an unusual source of silver in a period not too far removed from Curtius Rufus' *ornamenta triumphalia* would seem to support the desperate Roman search for silver to mint.[89]

3) The few Roman coins found within or near the borders of Nahapāna's kingdom are much later than the first century CE.[90] Warmington, Turner, and McDowall have suggested that Roman *denarii* exported at the time of the *Periplus* were melted down to make Nahapāna's silver coins.[91] However, this hypothesis is difficult to reconcile with the *Periplus* account of Roman coins being exchanged for local currency at a profit. An alternative suggestion is that *denarii* and *aurei* were used by Indian traders from Barygaza for their own trade in the subcontinent. For example, the Augustan and Tiberian *denarii* and *aurei* found at Adam, the Julio-Claudian *denarii* found at Akkenpalle (more than 1,500, from Augustus to Nero, but mostly Augustan and Tiberian), and other Roman coins found in Telangana, Andhra Pradesh, Tamil Nadu, and Kerala may have entered India via Barygaza.[92]

89 Tac. *Ann.* 11.20.

90 Two *aurei,* one of Marcus Aurelius from Nagdhara and another of Septimius Severus from Waghoda (Turner 1984, 69; 85).

91 Warmington 1928, 290; Turner 1984 [non vidi]; MacDowall 1991, 151.

92 Trade relationships between Ariake and Dakṣiṇāpatha: Peripl. M. Rubr. 51; between Ariake and Limyrike: Peripl. M. Rubr. 54.

References

Altekar, A. S. 1940. "The Relative Prices of Metals and Coins in Ancient India." *The Journal of Numismatic Society of India* 2: 1–13.

Balbir, N. 1993a. "Stories from the Āvaśyaka Commentaries." In *The Clever Adulteress and Other Stories: A Treasury of Jain Literature*, edited by Ph. Granoff, 17–74. New Delhi: Motilal Banarsidass.

Berghaus, P. 1988. "Republican and Early Roman Imperial Denarii from India." In *Ex Moneta, Essays on Numismatics in Honour of Dr. David W. MacDowall*, edited by A. K. Jha and S. Garg, vol. 1, 119–127. New Delhi: Harman Publishing House.

Bhandare, S. 1999. *Historical Analysis of the Satavahana Era: A Study of Coins*. PhD diss., University of Mumbai.

——. 2006. "A Tale of Two Dynasties: The Kshaharatas and the Satavahanas in the Deccan." In *Coins in India: Power and Communication*, edited by H. P. Ray, 23–33. Mumbai: Marg Publication.

Bhandarkar, D. R. 1921. *Lectures on Ancient Indian Numismatics*. Calcutta.

Bolin, S. 1958. *State and Currency in the Roman Empire to 300 A.D.* Stockholm.

Bopearachchi, O. 2006. "Chronologie et généalogie des premiers rois kushans: nouvelles données." *Comptes-rendus de l'Académie des Inscriptions et Belles-Lettres*, 1433–1447.

——. 2008. "Les premiers souverains kouchans: chronologie et iconographie monétaire." *Journal des Savants:* 3–56.

Borell, B. 2014. "The Power of Images: Coin Portraits of Roman Emperors on Jewellery Pendants in Early Southeast Asia." *Zeitschrift für Archäologie außereuropäischer Kulturen* 6: 7–43.

Boyer, A.-M. 1897. "Nahapana et l'ère Çaka." *Journal asiatique* s.9.10. (July–August 1897): 120–151.

Butcher, K. and M. Ponting. 2014. *The Metallurgy of Roman Silver Coinage: From the Reform of Nero to the Reform of Trajan*. Cambridge: Cambridge University Press.

Casson, L. 1989. *The* Periplus Maris Erythraei. Princeton: Princeton University Press.

Chakrabarti, D. K. 2005. *The Archaeology of the Deccan Routes*. New Delhi: Munshiram Manoharlal.

Cherian, P. J. and J. Menon. 2014. *Unearthing Pattanam: Histories, Cultures, Crossings*. New Delhi: National Museum, Kerala Council for Historical Research.

Cobb, M. A. 2018. *Rome and the Indian Ocean Trade: From Augustus to the Early Third Century CE*. Leiden: Brill.

Cribb, J. 1992. "Numismatic Evidence for the Date of the 'Periplus'." In *Indian Numismatics, History, Art and Culture: Essays in Honour of Dr. P. L. Gupta*, edited by D. W. MacDowall, S. Sharma, and S. Garg, 131–145. Delhi: Agam Kala Prakashan.

De Romanis, F. 1982/1987. "Roma e i Nótia dell'India. Ricerche sui rapporti tra Roma e l'India dravidica dal 30 a.C. all'età Flavia," *Helikon* 22 (27): 143–210 (1997. *Crossings: Early Mediterranean Contacts with India*, edited by F. De Romanis and A. Tchernia, 80–160. New Delhi: Manohar Publishers & Distributors).

——.1988. "Romanukharaṭṭha e Taprobane. Sui rapporti Roma-Ceylon nel I sec. d.C." *Helikon* 28: 5–58 (1997. *Crossings: Early Mediterranean Contacts with India*, edited by F. De Romanis and A. Tchernia, 161–237. New Delhi: Manohar Publishers & Distributors.

——. 2006. "Aurei after the Trade: Western Taxes and Eastern Gifts." In *Dal denarius al dinar. L'Oriente e la moneta romana. Atti dell'Incontro di studio, Roma, 16–18 settembre 2004*, edited by F. De Romanis and S. Sorda, 54–82. Roma: Istituto Italiano di Numismatica.

——. 2012. "On Dachinabades and Limyrike in the Periplus Maris Erythraei." In *Autour du* Périple de la mer Érythrée, edited by

M.-Fr. Boussac, J.-Fr. Salles et J.-B. Yon, Topoi. Supplément 11, 329–340. Paris: De Boccard.

——. 2020–2021. "Μέχρι τοῦ σύνεγγυς: nota a Periplus Maris Erythraei 50." *Incontri di filologia classica* 20: 41-52.

Deyell, J. S. 1984. "Indo-Greek and Ksaharata Coins from the Gujarat Seacoast." *The Numismatic Chronicle: The Journal of the Royal Numismatic Society* 144: 115–127.

Diskalkar, D. B. 1949. "Kasrawad Hoard of Silver Punch-Marked Coins." *The Journal of the Numismatic Society of India* 10: 146–153.

Dutta, M. 1990. *A Study of the Sātavāhana Coinage*. Calcutta: Harman Publishing House.

Errington, E. 2003. "A Survey of Late Hoards of Indian Punch-marked Coins." *The Numismatic Chronicle* 163: 69–121.

Falk, H. 2009. "Two Dated Sātavāhana Epigraphs." *Indo-Iranian Journal* 52: 198–200.

——. 2014. "Kushan Dynasty iii. Chronology of the Kushans" *Encyclopædia Iranica*. http://www.iranicaonline.org/articles/kushan-03-chronology.

Fishman, A. M. 2013. *The Silver Coinage of the Western Satraps in India (50–400 AD).*

Gokhale, S. 1991. *Kanheri Inscriptions*. Pune: Deccan College Post Graduate and Research Institute.

Ghosh, S. 2023. "Barygaza/Bharukaccha: A Long-Range History of the Port". *Economic History of India. Historiographical Issues and Perspectives. Essays in Honour of Professor Ranabir Chakravarti,* edited by R. Mahalakshmi and S. Ghosh, 369-391. New Delhi: Bloomsbury.

Gupta, P. L. 1965. *The Early Coins from Kerala*. Trivandrum: Department of Archaeology Government of Kerala.

——. 1992. "Barwani Hoard of Silver Punch-Marked Coins," *Numismatic Digest* 16: 6–23.

Gupta, P. L. and T. R. Hardaker. 2014. *Punch-marked Coinage of the Indian Subcontinent: Magadha-Mauryan Series*. Revised edition. New Delhi: Indian Institute of Research in Numismatic Studies.

Holt, F.L. 2012. "When Did the Greeks Abandon Ai Khanoum?" *Anabasis* 3: 161-172.

Hoover, O. 2013. *Handbook of the Coins of Baktria and Ancient India, Including Sogdiana, Margiana, Areia, and the Indo-Greek, Indo-Skythian, and Native Indian States South of the Hindu Kush, Fifth Century BC to First Century AD*. Lancaster: Classical Numismatic Group.

Howgego, C. 1995. *Ancient History from Coins*. London: Routledge.

Jha, A. and R. Dilip. 1994. *Studies in the Coinage of the Western Ksatrapas*. Anjaneri: Indian Institute of Research in Numismatic Studies.

Lahiri, N. 1992. *The Archaeology of the Trade Routes.* Oxford University Press, Delhi.

Lerner, J.D. 2011. "A Reappraisal of the Economic Inscriptions and Coin Finds from Aï Khanoum" *Anabasis* 2: 103-147.

Lüders, H. 1912. *A List of Brahmi Inscriptions from the Earliest Times to about A.D. 400 with the Exception of Those of Asoka. Appendix to Epigraphia Indica and Record of the Archaeological Survey of India*, vol. 10. Calcutta: Superintendent Government Printing.

MacDowall, D. W. 1991. "Indian Import of Roman Silver Coins." In *Coinage, Trade and Economy: The 3rd International Colloquium, January 8th–11th 1991 (Anjaneri)*, edited by A. K. Jha, 145–163. Anjaneri: Indian Institute of Research in Numismatic Studies.

——. 1996. "The Evidence of the Gazetter of Roman Artefacts in India." In *Tradition and Archaeology: Early Maritime Contacts in the Indian Ocean*, edited by H. P. Ray and J.-F. Salles, 79–95. New Delhi: Manohar Publishers and Distributors.

——. 2002a. "Foreign Coins Found in India: In View of the Monetary Systems Operating in the Countries of their Origin." In *Foreign Coins Found in the Indian Sub-Continent*, edited by D. W. MacDowall and A. Jha, 9–14. Anjaneri: Indian Institute of Research in Numismatic Studies.

——. 2002b. "The Indo-Roman Metal Trade." In *Foreign Coins Found in the Indian Sub-continent*, edited by D. W. MacDowall

and A. Jha, 39–44. Anjaneri: Indian Institute of Research in Numismatic Studies.

Mahadevan, I. 2003. *Early Tamil Epigraphy. From the Earliest Time to the Sixth Century A.D.*, Cambridge, MA and London: Harvard University Press.

Mattingly, H. 1923. *Coins of the Roman Empire in the British Museum: 1. Augustus to Vitellius*. London: Trustees of the British Museum.

Megow, W.-R. 1987. *Kameen von Augustus bis Alexander Severus*, Berlin: Walter de Gruyter & Co.

Mirashi, V.V. 1981. *The History and Inscriptions of the Sātavāhana and the Western Kshatrapas*. Bombay: Maharashtra State Board for Literature and Culture.

Mitra, D. 1951. "The Ābhīras and their Contributions to the Indian Culture." *Proceedings of the Indian History Congress* 14: 91–100.

Mitra Shastri, A. 1969. *India as Seen in the Bṛhatsaṁbita of Varāhamihira*. Delhi: Motilal Banarsidass.

——. 1995. "Jogalthambi Hoard of Nahapana Coins: Some Aspects." *Numismatic Digest* 19: 73–95.

——. 1999. "Purāṇas on the Sātavāhanas: An Archaeological–Historical Perspective." In *The Age of the Sātavāhanas* 1, edited by A.M. Shastri, 3–72. New Delhi: Aryan Books International.

——. 2002. "Some Aspects of Roman Coins in India." In *Foreign Coins Found in the Indian Sub-Continent*, edited by D.W. MacDowall and A. Jha, 45–52. Anjaneri: Indian Institute of Research in Numismatic Studies.

Nagaraju, S. 1981. *Buddhist Architecture of Western India (c. 250 B.C.–c. A.D. 300)*, Delhi: Agam Khala Prakasham.

Nakanishi, M. and O. v. Hinüber. 2014. *Kanaganahalli Inscriptions. Supplement to the Annual Report of the International Research Institute for Advanced Buddhology at Soka University for the Academic Year 2013*, vol. 17. Tokyo: The International Research Institute for Advanced Buddhology, Soka University.

Neelis, J. 2011. *Early Buddhist Transmission and Trade Networks: Mobility and Exchange within and beyond the Northwestern Borderlands of South Asia*. Leiden: Brill.

Olivelle, P. 2013. *King, Governance, and Law in Ancient India: Kautilya's Arthasastra—A New Annotated Translation*. Oxford: Oxford University Press.

——. 2020. "Long-Distance Trade in Ancient India: Evidence from Kauṭilya's Arthaśāstra." *The Indian Economic & Social History Review* 57 (1): 31–47.

Ollett, A. 2017. *Language of the Snakes: Prakrit, Sanskrit, and the Language Order of Premodern India*. Oakland: University of California Press.

Olsen, C.S. 2005. "Trade and Conservation of Himalayan Medicinal Plants: Nardostachys Grandiflora DC and Neopicrorhiza Scrophulariiflora (Pennell) Hong" *Biological Conservation* 125 (4): 505–514.

Pargiter, F.E. 1913. *The Purana Text of the Dynasties of the Kali Age*. London: H. Milford.

Pauli, F. 1986. "Nahapana / Manban.s vor 78 n.Chr.? Ein epigraphischer Neufund aus Indien und seine Bedeutung für die antike Südasien-Chronologie." In *Studien zur Alten Geschichte: Siegfried Lauffer zum 70. Geburtstag am 4. August 1981 dargebracht von Freuden, Kollegen und Schülern* 2, edited by H. Kalcyk, B. Gullath, and A. Graeber, 743–753. Rome: Giorgio Bretschneider.

Quagliotti, A.M. 1982. "Note sulla cronologia degli Śaka e degli Śatavāhana (La Grotta 3 Di Nasik)." *Rivista Degli Studi Orientali* 56: 75–113.

Rapin, C. and F. Grenet. 1983. "Inscriptions économiques de la trésorerie hellénistique d'Aï Khanoum. L'onomastique iranienne à Aï Khanoum." *Bulletin de correspondance hellénique* 107 (1): 315–381.

Rapson, E.J. 1908. *Catalogue of the Coins of the Andhra Dynasty the Western Kṣatrapas, the Traikūṭaka Dynasty and the "Bodhi" Dynasty*. London: British Museum. Department of Coins and Medals.

Ray, H. P. 1986. *Monastery and Guild: Commerce under the Sātavāhanas*. Delhi: Oxford University Press.

——. 2018. "Warp and Weft: Producing, Trading and Consuming Indian Textiles across the Seas (First–Thirteenth Centuries CE)." In *Textile Trades, Consumer Cultures, and the Material Worlds of the Indian Ocean: An Ocean of Cloth*, edited by P. Machado, S. Fee, and G. Campbell, 289–311. Cham: Palgrave Macmillan.

Sarma, I. K. 1980. *Coinage of the Sātavāhana Empire.* Delhi: Agam Kala Prakashan.

Schlingloff, D. 1974. "Cotton-Manufacture in Ancient India." *Journal of the Economic and Social History of the Orient* 17 (1): 81–90.

Schoff, W. H. 1912. *The Periplus of the Erythraean Sea: Travel and Trade in the Indian Ocean by a Merchant of the First Century*. New York: Longmans.

Scott, H. R. 1908. "The Nāsik (Joghaltembhi) Hoard of Nahapāna's Coins." *Journal of the Bombay Branch of the Royal Asiatic Society* 22: 223–244.

Senart, E. 1905–1906. "Inscriptions in the Caves at Nasik." *Epigraphia Indica* 8: 59–96.

Suresh, S. 2004. *Symbols of Trade: Roman and Pseudo-Roman Objects Found in India*. New Delhi: Manohar Publishers & Distributors.

Sutherland, C. H. V. 1987. "The 'Pontif Maxim' Aurei of Tiberius." *Numismatica e antichità classiche. Quaderni ticinesi* 16: 217–225.

Turner, P. 1984. *An Investigation of Roman and Local Silver Coins in South India, 1st to 3rd century A.D.* Unpublished PhD thesis, University of London.

Tsukamoto, K. 1996–2003. *A Comprehensive Study of Indian Buddhist Inscriptions*. 3 parts. Kyoto: Heirakuji-Shoten, 1996–2003.

Unnithan, N. G. 1963. "Eyyal Hoard of Silver Punch Marked and Roman Coins." *Journal of Numismatic Society of India* 25: 22–28.

Warmington, E. H. 1928. *The Commerce between the Roman Empire and India.* Cambridge: Cambridge University Press.

Wenning, R. 1993. "Eine neuerstellte Liste der Nabatäischen Dynastie." *Boreas. Münstersche Beiträge zur Archäologie* 16: 25–38.

Wild, F. and J. P. Wild. 2018. "Textile Contrasts at Berenike." In *The Eastern Desert of Egypt during the Greco-Roman Period: Archaeological Reports*, edited by J.-P. Brun. Paris: Collège de France.

Willis, M. 2009. *The Archaeology of Hindu Ritual: Temples and the Establishment of the Gods*. Cambridge: Cambridge University Press.