

ROME'S TRADE WITH THE EAST: THE SEA VOYAGE TO AFRICA AND INDIA

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I Introduction

"Previously not twenty ships dared . . . peep outside the Straits [of Bab el Mandeb], but now great fleets are sent as far as India and the extremities of Ethiopia." So runs Strabo's oft-quoted comment (17.1. 13 [798]) on Rome's twin lines of trade in the east, with India and with the east coast of Africa. Strabo wrote at the time of Augustus. Half a century or so later, Pliny the Elder delivered his equally oft-quoted remark (6.101) about the fifty million sesterces that purchases from India annually drained from the Empire. This farflung commerce was, no question about it, of substantial economic importance. East Africa, together with Arabia, supplied the incense that smoked on the altars, and the myrrh that perfumed the rich, the length and breadth of Rome's extensive dominions. India supplied their spices, ivory, silk (importing it from China), and other luxuries.¹ The purpose of this paper is to examine more closely than has been done before the precise sailing conditions that governed voyages to these

¹ For a masterly study of the India trade, see E. H. Warmington, *The Commerce between the Roman Empire and India* (Cambridge 1928). Archaeology has added some information since Warmington wrote; see M. Wheeler, *Rome Beyond the Imperial Frontiers* (London 1954), chapters xii–xiii. On trade with Africa, see chapter viii. In East Africa archaeology has so far undertaken only surveys, and these have yielded discouragingly little; see H. N. Chittick, "An Archaeological Reconnaissance of the Southern Somali Coast," *Azania* 4 (1969) 115–30, and "An Archaeological Reconnaissance in the Horn: The British-Somali Expedition, 1975," *Azania* 11 (1976) 117–33, as well as his brief but useful summary, "Early Ports in the Horn of Africa," *International Journal of Nautical Archaeology* 8 (1979) 273–77.

two areas and thereby reveal certain significant aspects that up to now have either escaped notice or not received the consideration they merit.

The sole way to East Africa, and the best to India, was by sea. The trading ventures to both were managed by the merchants of Alexandria. At their direction, the meager exports the Greco-Roman world sent to the east—they were of scant value compared with what was imported—were collected and put aboard Nile boats, brought up-river to Coptos, transferred there to donkeys and camels, and carried across Egypt's eastern desert to either Myos Hormos or Berenice, the major ports on the Egyptian side of the Red Sea. Conversely, at these two ports were discharged the cargoes that arrived from East Africa and India; reversing the path of the exports, they were taken overland to Coptos, ferried down the Nile to Alexandria, and from there distributed all over the Mediterranean world.²

From Myos Hormos or Berenice movement eastward was solely by water, and it involved long voyaging. The African trade route reached down to Zanzibar, more than 3,000 nautical miles away, while the Indian went either to the Indus River delta or other points on the northwest coast or to the Malabar coast, a journey of well over 2,500 in the one case and 3,000 in the other.

This exotic aspect of Rome's commerce has received its share of attention in the scholarly literature. And all who have treated it have recognized that what made voyages over such distances feasible was the monsoons, the winds of the Arabian Sea and western Indian Ocean that blow from the northeast during the winter months and then conveniently switch to the southwest during the summer.³ We have two witnesses, both writing about the middle of the 1st century A.D. or slightly later, to the use of the monsoons by the ancients. The first and most reliable is the anonymous author of the *Periplus maris*

² Pliny, *NH* 6.102–103, gives in detail the route to Berenice. For Myos Hormos, see Strabo 2.5.12 (118). It seems to have been—or become—less important; cf. R. Bagnall, *The Florida Ostraka* (Greek, Roman, and Byzantine Monographs 7, Durham 1976) 34–39. Berenice was well over 200 miles south of Myos Hormos, which meant, for returning vessels, that much less beating against the northerlies which prevail in the Red Sea above latitude 20° north.

³ E.g., M. Charlesworth, *Trade-Routes and Commerce of the Roman Empire* (Cambridge 19262) 60; Warmington (above, note 1) 43–51; G. Hourani, *Arab Seafaring* (Princeton 1951) 24–28; Wheeler (above, note 1) chapter x; R. Böker, *RE* Supplbd. 9 (1962) s.v. “Monsunschiffahrt nach Indien;” M. Cary and E. Warmington, *The Ancient Explorers* (Penguin 19632) 95–96.

Erythraei.⁴ This work, the single example of its kind to have survived, is a combination of coast pilot and merchant's guide for two trade routes: one along the western shore of the Red Sea, the southern of the Gulf of Aden, and the eastern of Africa to Zanzibar or a little further, the other down the Red Sea and along the southern coast of Arabia and across the Arabian Sea to India. The author (57) notes that skippers on the India run had for long cautiously hugged the shore, but then learned to sail directly over open water by exploiting the southwest wind. He says nothing about the return, but our second witness, Pliny the Elder (6.106), supplies the lack, informing us that ships left India in December–January, i.e., when the northeast monsoon was well established.

Presumably the vessels that made these monsoon passages were the same types that plied the Mediterranean. This certainly must have been true for the passage to India since, as we shall see, it involved rough winds and waters, and the Mediterranean sea-going freighters of the age were particularly well suited for such work. Not only were they big—the largest were well over 1,000 tons burden—but they boasted massively strong hulls whose planking was held together by thousands of close-set mortise and tenon joints, a method of construction unique to Greek and Roman shipwrights. Their rig, too, made for safety, its major component being a vast broad square sail on a relatively short mainmast; it was, however, slow and only effective with a following wind.⁵ The Arab dhows that sail to India today and have for centuries are less limited; with their lateen sails they can travel against the wind—although, being much feebler in construction than ancient craft, only against a light one.⁶

⁴ The date of the *Periplus*, after a recent flurry of heated argument to lower it to the 3rd century A.D., is back to its previous favored place, the second half of the 1st century A.D. For a judicious review of the problem, see W. Raunig, "Die Versuche einer Datierung des *Periplus maris Erythraei*," *Mitteilungen der anthropologischen Gesellschaft in Wien* 100 (1970) 231–42, esp. 240, and, for a listing of the bulky bibliography on the question, M. Raschke in *ANRW* ii.9.2 (Berlin 1978) 979–80, notes 1342–43.

⁵ See L. Casson, *Ships and Seamanship in the Ancient World* (Princeton 1971) 183–90 (size of Mediterranean freighters), 201–208 (hull structure), 239–43 (rig).

⁶ Thus Ibn Mājid, author of a treatise on navigation published toward the end of the 15th century, cautions that, in certain crossings from the south coast of Arabia to the island of Socotra, "they do not travel . . . unless the wind is light because they are travelling contrary to the Kaws [southwest wind]" (G. Tibbets, *Arab Navigation in the Indian Ocean before the Coming of the Portuguese*, Oriental Translation Fund, New Series xlii [London 1971] 229). A few lines later he speaks of a "'wind of two sails' also needing a light wind;" a 'wind of two sails' was a course not even involving a head

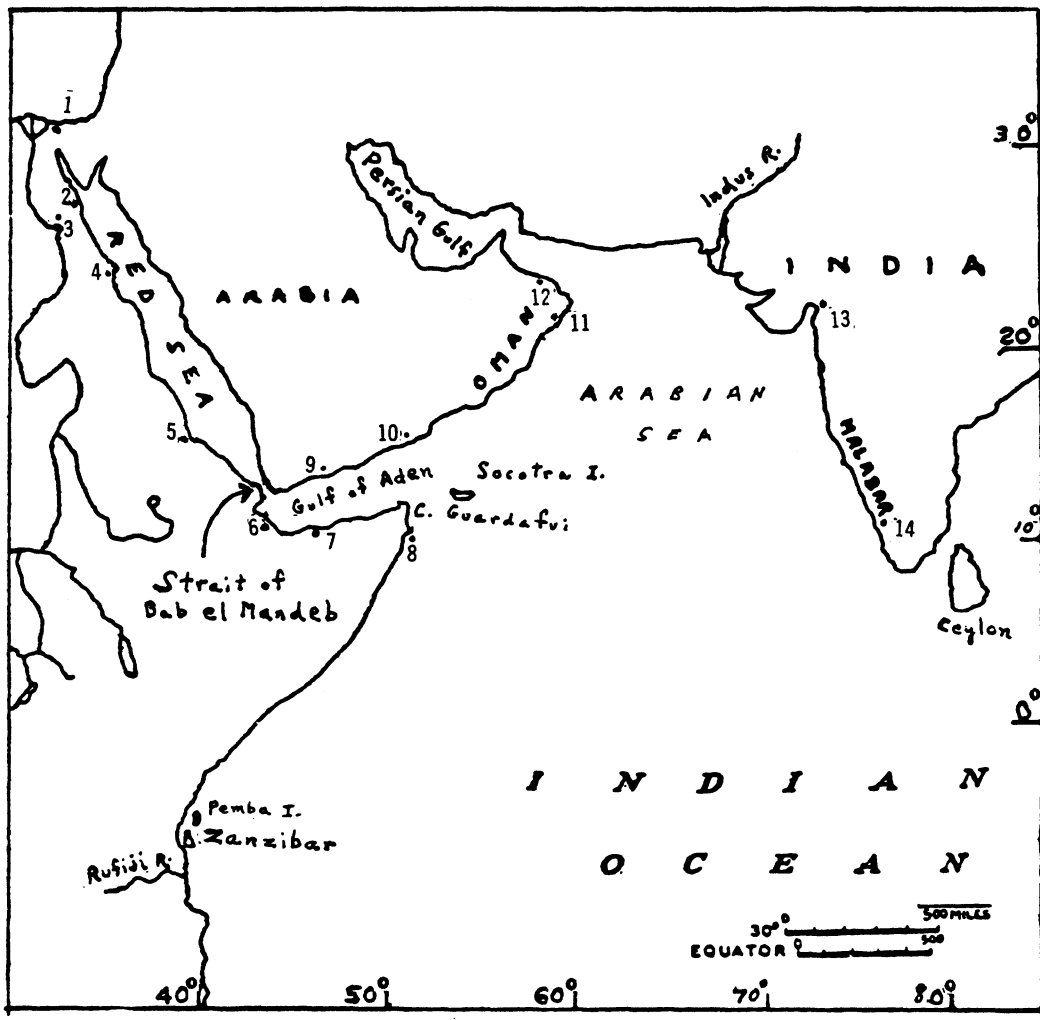
II The Monsoons

To say that the monsoons blow from the northeast in winter and southwest in summer is only partly true and can be misleading. In the first place, there are transition periods in spring and autumn as one monsoon comes to a close and the other begins; at such times the wind ceases to be fixed and turns variable until the new monsoon takes hold. Even more important, the two monsoons differ greatly in their nature. The southwest is boisterous and stormy; to quote Alan Villiers, who wrote from extensive personal experience, "Rain falls heavily during its continuance, and the weather is usually so bad that the exposed ports on the Indian coast are closed and the smaller trading vessels take shelter . . . The other monsoon—the northeast—is as gracious, as clear, and as balmy as a permanent trade, and it is this wind which wafts the great dhows—the argosies of Araby—on their long voyages from the Persian Gulf to Zanzibar and beyond, and which blows the Indian dhows from the Malabar coast to Mombasa and the Madagascar coast."⁷ Lastly, the Red Sea, which had to be traversed going and coming, has its own wind pattern which does not totally coincide with the monsoons. The accompanying chart shows what the winds in general are, month by month, in the areas under consideration.⁸

wind but just a wind on the beam, its name deriving from the fact that one would sail with it on one side and then, returning, on the other (Tibbetts 369). Alan Villiers describes a voyage in a dhow during which they beat for 500 miles along the south coast of Arabia; it was against breezes so mild that the ship often merely ghosted along and was frequently becalmed (*Sons of Sinbad* [New York 1949] 26, 30, 48–49).

⁷ *Monsoon Seas* (New York 1952) 7.

⁸ For the monsoons, see U.S. Defense Mapping Agency, Hydrographic Center Pub. 61, *Sailing Directions for the Red Sea and Gulf of Aden* (5th ed. 1965, rev. 1976) Section 1–26 to 28 (Red Sea), 1–29 to 31 (Gulf of Aden); Pub. 60, *Sailing Directions for the Southeast Coast of Africa* (5th ed. 1968, rev. 1975) Section 1–23; Pub. 63, *Sailing Directions for the West Coast of India* (5th ed. 1967, rev. 1976) Section 1–26 to 27.



KEY

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|---------------|-------------|-------------|
| 1 Alexandria | 6 Zeila | 11 Sur |
| 2 Myos Hormos | 7 Berbera | 12 Muscat |
| 3 Coptos | 8 Ras Hafun | 13 Barygaza |
| 4 Berenice | 9 Aden | 14 Muziris |
| 5 Adulis | 10 Mukalla | |

Chart of Prevailing Winds from the Red Sea to East Africa and India

	A June to August	B September	C October	D November to December	E December to March	F April	G May
1 Red Sea south of 20° N	N, NW	N, NW shifting to variable	S, SE	S, SE			S,SE shifting to N, NE
2 Gulf of Aden	S, SW, W		variable, shifting to E, ENE	E, ENE			E, ENE also variables
3 East African Coast to Zanzibar	S, SW	S, SW shifting to NE with variables and calms		N, NE		NE shifting to S, SW	
4 North-western Coast of India	SW	W, SW with variables and calms	S, SW shifting to NE	N, NE		NW to SW	S, SW
5 South-western Coast of India	SW	W, SW shifting to W, NW	light northerlies	N, NE		NW to SW	S, SW

All who have written on the subject of Rome's Indian Ocean trade make no distinction between voyages to India and Africa but treat them together. And it is easy to see why: after all, they were both about the same length, some 3,000 nautical miles, and took place in roughly the same waters and under the same monsoon winds. The point of what follows is to reveal that these similarities are superficial, that the two trading ventures were not at all alike. To India and back could be done within a year but involved considerable danger. To Africa took twice as long but was a sailor's dream.

III

The Voyage to Zanzibar

The *Periplus* (1–18) provides a detailed account of the route to East Africa. At Myos Hormos or Berenice vessels loaded up with the sort of goods that has figured in trade with primitive peoples right up to this century: cheap clothing and cookware and dinnerware, metals for making into ornaments or utensils or weapons, and, for the tribal chieftains, luxury garments and objects of gold and silver. They proceeded along the eastern shore of the Red Sea, where their first important stop was at Adulis (Massawa), Ethiopia's only good seaport; here they took on ivory and tortoise shell. Then they coasted along the south shore of the Gulf of Aden, putting in at points all along the way to trade for the myrrh and incense for which the region was famous. Rounding Cape Guardafui, they sailed down to Ras Hafun, still picking up myrrh and incense, and then continued south along the eastern shore of Africa to Menouthias Island, which is either Pemba or Zanzibar, and, finally, Rhapta, which is either Dar es Salaam or at the mouth of the Rufiji River, depending upon the identification of Menouthias.⁹ Here, as at Ethiopia, the usual cheap trade goods were exchanged for ivory and tortoise shell.

Ships heading for Africa, the *Periplus* informs us (14), left Egypt in July. This is what we would expect. It enabled a skipper to travel:

⁹ The identification has long been a source of controversy; for the bibliography, see Raschke (above, note 4) 933, note 1139. Over a century ago Charles Guillaumin, a seaman who had traveled the waters in the days of sail, set forth the nearly equal claims of Pemba and Zanzibar to be identified with Menouthias and decided in favor of Zanzibar; see his *Documents sur l'histoire, la géographie, et le commerce de l'Afrique orientale* (Paris [1856]) 1.110–15. The latest to take up the question, B. Dato (‘‘Rhapta: The Location and Importance of East Africa's First Port,’’ *Azania* 5 [1970] 65–75), leaves it open.

from Egypt to the Gulf of Aden with the favorable northerlies (Chart 1A), and

through the Gulf of Aden with the favorable southwest monsoon (Chart 2A).

In the Red Sea, because of its dangerous shoals, all vessels sail only during the day, putting in toward nightfall at the nearest available anchorage.¹⁰ Consequently, even if they traveled steadily, getting quickly in and out of the ports they stopped at, they still would have required at least 30 to 40 days to reach Cape Guardafui.¹¹ In any event, there was no sense in arriving there before the onset of the northeast monsoon in October; a better time yet was mid-October or the beginning of November when it had definitely settled in (Chart 3 C/D).¹² Until then the southwest monsoon was still blowing, and even more efficient sailing craft than the ancients' square-riggers could not have beat down the coast of East Africa against it.¹³ The *Periplus* (14) specifically mentions that some ships tramped, selling and buying cargo at every point along the way, while others made directly for the incense ports of the African horn. They all must have traveled leisurely, taking from seventy-five days (say, July 15 to October 1) to over one hundred (July 15 to November 1) to reach Cape Guardafui. Once there, as we shall see in a moment, there was no need whatsoever to hurry.

¹⁰ Cf. Carsten Niebuhr's experience in 1762 (see T. Hansen, *Arabia Felix: The Danish Expedition of 1761-1767* [New York 1962] 209) and Alan Villiers in 1938 (above, note 6, 7).

¹¹ Ancient ships could make between four and six knots with a fair wind (Casson [above, note 5] 288) and thus log roughly 50 nautical miles during a day's run. Guillaïn (above, note 9) 1.96-97 estimated 48 for the first part of the journey down the east coast of Africa and 60 for the second, the difference caused by variation in the strength of the current (cf. below, note 14). The distance from Myos Hormos to Cape Guardafui is c. 1700 nautical miles.

¹² As Ibn Mājid puts it (above, note 6, 234), "Those who travel from Aden and Yemen to Zanj [the African coast off Zanzibar] should start on the 320th or the 330th day [8 or 18 October]." Cf. Guillaïn (above, note 9) 1.95: "La mousson de l'est se fait sentir [in the Gulf of Aden] dans la première quinzaine d'octobre, et les bateaux qui vont à l'est de ce cap [Guardafui] doivent avoir dépassé son méridien avant le 1^{er} novembre."

¹³ Cf. the rueful words of a British naval commander who in 1799 tried to sail a full-rigged ship against the even milder northeast monsoon: "Thus terminated one of the most perplexing and tedious Voyages ever made by any Ships. It is, I believe, the first Attempt ever made to beat up the *Coast of Africa* against the *Easterly Monsoon*, and it is to be hoped Nobody would ever attempt it again" (A. Bissell, *A Voyage from England to the Red-Sea and along the East Coast of Arabia to Bombay . . . 1798 and 1799* [London 1806] 47).

The next stage, from Guardafui southward, was not only smooth sailing but quick, with the northeast monsoon at a vessel's heels (Chart 3D). The distance is some 1400 nautical miles and current is favorable as well as wind.¹⁴ The voyage, during which vessels could sail day and night (cf. *Periplus* 15), might have lasted but two weeks, but we must, of course, allow for stops en route.

Thus arrival in the vicinity of Zanzibar would have taken place in November or December. Now, once there, a skipper was committed to spending no less than eight months in the area. The earliest he could possibly leave, and then only if he intended to dawdle on his way up the African coast, was August. For he had to time his voyage so that he

would sail from Zanzibar to Guardafui no later than September–October in order to catch the end of the southwest monsoon (Chart 3B/C),

reach Guardafui not before October in order to catch the early northeast monsoon which would provide favorable winds for traversing the Gulf of Aden (Chart 2C), and

catch favorable winter southerlies in the Red Sea (Chart 1C/D).¹⁵

If we allow for the sail from Guardafui back to Egypt the same amount of time as on the outbound voyage, 30 to 40 days, he would arrive home in November or December, a year and a half after his departure. This left six months or so to collect a cargo for another venture to the area the next July. In effect, two years were required for a round trip.

It was the dog-leg into the Gulf of Aden that caused the trouble, the need, after sailing north to Cape Guardafui, to make an abrupt left turn and head west. Ships returning from Zanzibar to the Persian

¹⁴ Cf. Guillaín (above, note 9) 1.96: 1.3 knots of current as far as some 60 miles south of Ras Asswad (4° 34' N), 2–3 from there on.

¹⁵ This is the way the ship that carried Henry Salt from Zanzibar to Aden in 1809 did it; see his *Voyage to Abyssinia* (London 1814, reprinted 1967) 94–99. The southwest monsoon carried them north to Cape Guardafui by 27 September, then a light wind typical of the transition period and adverse current prevented progress all of the 28th, after which the northeast monsoon wafted them to Aden by the 3rd of October. Zanzibar was by no means the only place where the alternation of the monsoons could cause long layovers. "Because of the Azyab [northeast monsoon] . . . he who is forced to moor in Yemen," states Ibn Mājid (Tibbetts, above, note 6, 227), "must stay there a whole year when bound for India" (from October, when the northeast monsoon sets in, until September of the following year, when the southwest monsoon has quieted down sufficiently to allow a safe passage and arrival [cf. below, note 27]).

Gulf or to India had a straight run and hence could depart with the oncoming of the monsoon in April, after a layover that might be as short as three months.¹⁶ Today dhows bound for the Red Sea may leave with them, taking advantage of the fact that in May the winds of the Gulf of Aden are not yet firmly locked into the southwesterly direction they will have in June but offer some variation.¹⁷ This option was not open to a skipper of an ancient craft with its square rig, slower and less flexible than a dhow's. He could not leave until mid-April or so,¹⁸ and, if the variables in the Gulf held him up,¹⁹ he might not reach the Straits of Bab el Mandeb until the end of May—just when the wind would turn against him in the Red Sea (Chart 1G). Besides, even if he was lucky enough to have a fair passage all the way, he would arrive no earlier than June, and this would hardly leave time to unload, refit, and take on a new cargo for departure in July. By lingering in Zanzibar until the closing days of the southwest monsoon, he would be assured of fair and moderate winds all the way and plenty of time to prepare for a new round trip.

Is it not possible that vessels which started from Egypt went only as far as Africa's horn, leaving the long leg to Zanzibar and back to others for whom the voyage would involve far less waiting for the

¹⁶ Alan Villiers traveled on a dhow from the Persian Gulf that arrived at Zanzibar in February, which was late since others had arrived in January, and left on 15 April (above, note 6, 206, 269). Arrival in January and departure in April is standard practice; cf. A. Prins, "The Persian Gulf Dhows," *Persica* 2 (1965–66) 1–18 at 5–6. Cf. Bissell (above, note 13) 35: "The small *Trading Vessels* from Muscat, and the Red Sea, after discharging their Cargoes, which is chiefly *Dates*, always *dismantle*, and *move* into an *Inner Harbour*, at the *back* of the *town*, and wait the *return* of the [southwest] *Monsoon*."

¹⁷ Cf. Datto (above, note 9) 67.

¹⁸ Vessels could not leave Zanzibar until the southwest monsoon had established itself, and this might be well into April; cf. Bissell (above, note 13) 37: "They [the locals of Zanzibar] ridiculed the *Idea* of our going away, before the SW Monsoon set in, and said we should be plagued with *Calms* and *Variable Winds*, with *Southerly Currents* till the *Middle* of *April*."

¹⁹ Dhows generally shun the Gulf of Aden during May precisely because the winds then cannot be trusted; cf. Ibn Mājid's statement quoted above, note 15, and the observations of a naval officer who visited Berbera in 1848: "From April to the early part of October, the place was utterly deserted . . . ; but no sooner did the season change, than . . . small craft from the ports of Yemen . . . hastened across, followed, about a fortnight to three weeks later, by their larger brethren from Muscat, Soor, and Ras el Khyma . . . By the end of March . . . , craft of all kinds . . . commence their homeward journey. By the first week of April the place is again deserted" (*Journal of the Royal Geographical Society* 19 [1849] 54–55; also quoted by Richard Burton in his *First Footsteps in East Africa* [London 1856, reprinted 1966] 225–26).

turn of the monsoons? The *Periplus* (16) distinctly mentions that Rhapta—either Dar es Salaam or on the Rufiji river south of it—was a port of call for Arab craft; could they not have handled its trade? That would leave for Greco-Roman vessels only the trip from Egypt to the horn and back, which could easily be done within half a year, outbound in July–September (Chart 1A/B, 2A/B) and the return in October–December (2C/D, 1C/D). Very possibly some did it this way—but the author of the *Periplus* nowhere speaks of them. What is more, in a handbook written in Greek and therefore addressed to Greek-speaking merchants and skippers, he carries on his description without a break as far as Rhapta; the clear implication is that it was regularly part of the trade route.

Though the voyage was long for these Greek traders, it was easy, since all of it took place under ideal sailing conditions. Outward bound, the leg through the Gulf of Aden was done during the closing days of the southwest monsoon when it had lost much of its bite, and the leg down the coast of East Africa under the mild northeast monsoon. Homeward bound, the leg back up the coast took place during the closing days of the southwest monsoon and the traversing of the Gulf of Aden during the opening days of the northeast monsoon. Indeed, the voyage is so undemanding that currently merchants entrust their goods, and passengers their lives, to dhows of such modest size and in such wretched condition and so hopelessly overcrowded that they could not possibly survive even the slightest storm at sea.²⁰

IV

The Voyage to India

Ships left Egypt for India, as for Africa, in July, the *Periplus* (39, 49, 56) informs us. They did so for the same reasons, to take advantage of the summer northerlies in the Red Sea (Chart 1A) in order to get down to its exit at Bab el Mandeb, and of the southwest monsoon (Chart 2A) in order to get out of the Gulf of Aden. And, again as the *Periplus* (57) specifically informs us, carried by the southwest monsoon they sailed over open water either to the mouth of the Indus River or Barygaza (on the Gulf of Cambay) on India's northwest coast or to Muziris on the southwest coast.

²⁰ Cf. Villiers (above, note 6) 141, 154–55, 282.

How long did the voyage take? Pliny the Elder offers some data (6.104). He agrees with the author of the *Periplus* that vessels made their departure in mid-summer. He then states that "Ocelis in Arabia [on the Straits of Bab el Mandeb] or Cane in the incense country [probably Husn al Ghurab in the Hadhramaut west of Mukalla]²¹ was reached in about 30 days . . . From Ocelis . . . one sails with the southwest wind to Muziris . . . in 40." These figures are cited by everyone who has written on the subject, almost always without question.²² Yet the first is most curiously expressed and the second must be a mistake. Why give the same traveling time to Ocelis and Cane, when Cane is over 200 miles further? It is like giving the same

²¹ For the identification, see W. Schoff's translation of the *Periplus* (New York 1912) 116, and G. Mathew in H. N. Chittick and R. Rotberg, eds., *East Africa and the Orient* (New York 1975) 159–60.

²² W. Kroll, *RE* s.v. "Schiffahrt" (1923) 419; Warmington (above, note 1) 46, 48, and 342, note 48; Wheeler (above, note 1) 126; Cary-Warmington (above, note 3) 97; G. Van Beek in *Journal of the American Oriental Society* 80 (1960) 139. Schoff (above, note 21) 233 renders Pliny's words without comment. Hourani (above, note 3) 26 is aware that 40 days is hardly fast but does not question the figure. Warmington does see an error in Pliny's numbers—but in the wrong place. In 6.84 Pliny tells of a traveler, the freedman of a certain Annius Plocamus, who was caught by strong northerlies off Arabia and blown helplessly until, 15 days later, he landed on Ceylon. Warmington (341, note 30) suggests altering Pliny's *xv* to *xl* to bring it in line with the figure of 40 days we are discussing. The distance from Arabia to Ceylon is some 1500 to 1600 nautical miles, and this, traversed in 15 days, would work out to an average speed of something over 4 knots—which, as I show below, is more or less what we would expect with winds of presumably gale force or near it. I would reverse Warmington's suggestion and read *xv* instead of *xl* in 6.104!

E. Ascher in two articles in the *Journal of Tropical Geography* (a publication of the universities of Singapore and Malaya) entitled "Graeco-Roman Nautical Technology and Modern Sailing Information" (30, 1970, 10–26) and "The Timetables of the *Periplus Maris Erythraei* and of Pliny's Voyage to India" (34, 1974, 1–7) questions Pliny's figure—but he questions practically all Pliny's data and the *Periplus* to boot. This is because Ascher is convinced—it must be by intuition, for he cites no sources, either primary or secondary, and indeed there are none to cite—that the Roman merchantman was "undoubtedly inferior to her Greek and Phoenician forebears," was of such a "clumsy nature . . . [that] in a strong wind [she] was liable to be swamped" (1970, 13); manifestly such a wretched type of ship could not make the voyages Pliny and the *Periplus* attribute to it, so Ascher then proceeds to tell us what Pliny and the *Periplus* should have said. We have nothing but the vaguest notion of what Phoenician craft were like (and no one has ever suggested they were the forebears of "Roman" merchantmen), but we do know for certain that the ships plying the seas in the days of the *Periplus* were vastly bigger, sturdier, and better rigged than Ascher's "superior" Greek forebears (cf., e.g., Lucian, *Navigium* 5). Those vessels "liable to be swamped"? Ascher has not even read the account of St. Paul's shipwreck!

time for the voyage, say, from Marseilles to both Messina and Naples. The second figure, 40 days from Bab el Mandeb to Muziris (just north of Cochin), since the distance in round numbers is 2,000 nautical miles, works out to an average speed of 2 knots. Yet if a ship left Egypt in mid-July, and then 30 days later Ocelis in mid-August, it would have on its heels the southwest monsoon just when that strong wind was blowing its hardest, averaging more than 20 to 30 knots in the waters between the horn of Africa and the southwest coast of India.²³ Ancient sailing craft were capable of doing between four and six knots with favorable winds in the Mediterranean, as we glean from voyages Pliny himself describes; surely they would have done at least as well on the run to India under the southwest monsoon, in other words made the crossing in twenty days, half the time Pliny allots.²⁴ Somehow there is a tendency to gloss over Pliny's errors or forgive them. "Ships sail back from India," he says (6.106), "at the beginning . . . of December or at any rate . . . before January 15," which is precisely what we would expect, since by that time the northeast monsoon had set in. "Moreover," he adds, "they sail from India with the southeast wind." "By a slip," explains E. H. Warmington, author of the definitive study of Rome's India trade, "Pliny calls [the northeast monsoon] *Volturnus* [southeast]."²⁵ With the same forbearance, let us say that by a slip he wrote 40 instead of 20.

The return was no problem: departure in December–January meant that it took place during the benign northeast monsoon (Chart 4D/E, 5D/E). And, since this lasted from November to April, one could shove off even earlier or later.²⁶ But there was no leeway for the

²³ *Sailing Directions for the . . . Gulf of Aden* (above, note 8) section 1–31.

²⁴ For speed of ancient craft, cf. Casson (above, note 5) 282–88. Dhows frequently make the voyage in 20 days (Van Beek, above, note 22); though faster than ancient ships they sail, as we shall see in a moment, when the winds are more moderate.

²⁵ Above, note 1, 48.

²⁶ Since the winter was precisely the time for returning from India to the Red sea, one is puzzled by the way commentators have consistently interpreted a passage in *Periplus* 32. The author there describes Moscha, one of the ports for the export of frankincense located on the Dhofar plain just west of Oman (cf. Schoff [above, note 21] 140–142). Among the vessels that loaded up here were "those that sailed by [*parapleonta*] out of Limyrike [the southwestern coast of India] or Barygaza [Broach] and passed the winter [*paracheimasanta*, sc. at Moscha], the time of year being late." Schoff's translation reveals that he takes these to be Arab craft returning from India (he even renders *parapleonta* "returning"), and he has been followed by Warmington (above, note 1) 342, note 34, Wheeler (above, note 1) 117, Van Beek (*Biblical Archaeologist* 23 [1960] 79). But there is no reason for Arab craft to stop and winter at Moscha; winter was precisely the time to return from India not only to Arabia but

outbound voyage; that had to be timed as carefully as the home-bound from Zanzibar which we discussed a moment ago. So far as winds were concerned, leaving the Red Sea ports in June might seem as good as July (Chart 1A, 2A, 4A, 5A). But there was more to be considered than the direction of the wind. Departure in June would bring a vessel to India's shores in August—and that was to be avoided at all cost. During most of the summer, sailing conditions on India's west coast are so dangerous that practically all maritime activity ceases. This is particularly true of the southwestern coast, where Muziris, the end of Pliny's "40-day" voyage lay. At present in this area the marine insurance rates, which vary between 1 and 1¾% during the northeast monsoon, rise to 20% by the end of May when the southwest monsoon has set in, and, during June, July, and August, marine insurance is simply not available at any price. By September it is again offered at the fairly reasonable rate of 2½%.²⁷ It follows that ancient vessels must have left their Red Sea ports in July and not before in order to reach the coast of India no earlier than September, when the southwest monsoon was approaching its end and beginning to quiet down. Arrival anytime later, in October, was inadvisable since it would have exposed ships to the contrary winds of the northeast monsoon (Chart 4C, 5C).

Thus the skippers who plied between Roman Egypt and India were not foolhardy: by delaying their departure until July, they avoided India's coast when it was most dangerous. But they still had to carry out a good part of their ocean crossing during the time when the southwest monsoon was blowing its hardest, often stirring up violent storms. From the writings of Arab navigators of the late 15th and early 16th century we know that in that age Arab skippers also used the southwest monsoon, but delayed departure until the end of August and the beginning of September when it was beginning to slacken. They were able to do so since their ships were either fast

anywhere west of it. C. Müller, in his commentary to the passage (*Geographi Graeci Minores* [Paris 1855] 1.282), suggested they were vessels which "serius enavigaverant quam ut secundo etesiarum flatu in Africae oram deferri possent"—which makes no sense either; winter was precisely the season for sailing from Arabia to Africa (cf. the observations of a naval officer quoted above, note 19). The ships must have been Indian, not Arab; having lingered in Arabia too long to catch the end of the southwest monsoon in August–September, they had to wait through the winter until it returned the following spring; cf. Ibn Mājid's statement quoted above, note 15.

²⁷ The 15th- and 16th-century Arab writers on navigation took it for granted that most of the ports on India's west coast were closed from May to July and practically all of them in June and July (Tibbetts [above, note 6] 367–68). For the insurance rates, see R. Bowen, "The Dhow Sailor," *The American Neptune* 11 (1951) 5–46 at 12.

enough to reach India before the coming of the northeast monsoon, or, failing that, with their lateen rigs could sail against the feeble breezes of its early stages.²⁸ The ancients did not have this alternative. As the author of the *Periplus* (39) puts it in his matter-of-fact way, "The crossing with these [southwest winds] is risky but absolutely fair and shorter."

V

Conclusion

Thus, two areas of trade, which traditionally have been treated together, turn out upon examination to be totally different in the demands they made on both shipowners and merchants. A venture to Africa was safe, cheap, and involved only short coastal hauls. Consequently it was open to owners of craft of no great size, on which they had expended no great amount of money for upkeep (like the "incredibly small and decrepit" dhows Alan Villiers saw making the voyage²⁹), and whose scant cargo space they might charter to a handful of small-time traders. And neither owners nor traders were much concerned about storms at sea. However, though their stakes were modest and relatively safe, two long years had to pass before there were any profits to pocket.

On the other hand, ventures to India—at least the ones our sources consider the most important, those that exploited the direct crossing over open water—were just the reverse. It took only a year for the capital invested to yield a return. But the amount of capital required was formidable, and there was a definite element of risk. Such trading ventures were open only to the owners of powerful vessels able to

²⁸ The Arab navigators recommend departing for India as follows (Tibbetts [above, note 6] 365): from Zeila and Berbera on 24 or 25 August, from Aden between 24 and 29 August (although Ibn Mājid will allow up to 18 September), from Shihr or Mishqās or Zafar (on the south coast of Arabia roughly 300, 400, and 600 miles respectively east of Aden) on 3 September or 14 September or (Ibn Mājid again) 8 October. These are consistently later than the ancients' departure date. This is understandable. The later one left, the weaker were the winds of the southwest monsoon that were encountered and the safer the crossing, a crucial consideration for Arab craft, whose mode of construction was far feeble than the Greco-Roman (cf. J. Hornell, *Water Transport* [Cambridge 1946] 234–35). The same departure dates prevail today; see Van Beek (above, note 22) 139 (*pace* Raschke [above, note 4, 937] who accuses him of not saying exactly what he does say). Van Beek, by accepting Pliny's figures, wrongly concludes that the ancients also left this late in the season.

²⁹ Above, note 6, 141.

endure the force of the southwest monsoon and to the merchants with the money to purchase enough of the costly merchandise India exported—spices, silks, and the like—to fill the capacious holds. The India trade was for large-scale operators, whether shipowners or traders.