TABLE 16.2
Travel times of Carolingian groups and messages between Italy and Francia (arranged in increasing order of maximum duration)

Duration	Places	Comment	Dates	No.
?15 days	Piacenza–Senlis–Rheims	urgent news of Lothar II's death probably already known to Hincmar of Rheims	8–?23 August 869	1
31 days	Rome–Freising	Bishop Hitto of Freising, bearing relics	30 May–1 July 834	2
less than 46 days	Pavia–Lorsch	Charlemagne and his retinue	after 16 July–before 1 September 774	3
33–50 days	Rheims–Rome	pope and his retinue	5/22 October–before 24 November 816	4
50–1 days	Rome–Rheims or Corbeny (Map 15.1)	papal letter to Hincmar of Rheims and Charles the Bald, not urgent	23/4 October–13 December 867	5
53 days	Rome–Compiègne	papal letter and palm for Palm Sunday, not urgent	13 February–7 April 877	6
52 days	Pavia–Ponthion	pope and his retinue	15 November 753–6 January 754	7
41–63 days	Rome–Rheims	pope and his retinue	1/22 August–2 October 816	8
66 days	Rome–Rheims	papal letter to Hincmar, not urgent	5 January–11 March 876 (a leap year)	9

Sources: 1. Schlesinger 1970, 460–1; an alternative explanation is possible. 2. *Translatio Ss. Alexandri et Iustini* (*BHL* 271), 1, *MGH SS* 15.1.287.24–40; relics entered Freising on 1 July, according to a Freising calendar reported by *AASS* Sept. 5.472D–E. 3. BM 167–169. 4. BM 634 shows Louis the Pious at Samoussy on 23 October 816; Stephen IV died 24 January 817, "tertio, postquam Romam venerat, mense, sed nondum exacto . . . obiit," *Ann. regni Franc.*, a. 817, p. 145. 5. JE 2879 and almost certainly 2882; *Ann. Bert.*, a. 867, p. 140. 6. JE 3079; *Ann. Bert.*, a. 877, p. 212. 7. *Liber pont.*, Duchesne, 1.446.17–447.18. 8. BM 633a; JE 1: 317. (Von Simson 1874–6, 1: 68n1, dates the meeting at Rheims to 2 October; although BM 633a is non-committal, Hahn 1975, 21–2, admits the Simson date as probable). 9. JE 3034.

much more quickly. If Hincmar's testimony (no. 1) has been correctly interpreted, it shows the great speed with which Carolingian couriers crossed the Alps when matters of life and death were at stake; it compares well with the report of Charlemagne's death and the eleventh-century evidence. Less urgent and more common papal communications traveled at about the same speed as large groups of travelers, including the popes themselves. Typically such trips lasted around fifty days. The fifty-three days that a papal letter took to reach Compiègne in 877

is virtually identical to Eudes' direct trip between the same points, in fifty-two days, almost 400 years later.[42] We have already seen that Italy's main connection to the north had become overland around 700 (Ch. 3.3). This evidence shows that the communications over the Alps to the Frankish homelands far to the north were abundant and, in early medieval terms, relatively easy. Envoys, armies, and kings, popes, and pilgrims traveled back and forth between Italy and northern Europe in very considerable numbers. And they did so at rates of movement that compare well with those of the later Middle Ages. Are we to suppose they were alone on the mountain routes linking Frankish Europe to the Mediterranean?

4. Speed of sea travel

Evidence for the speed of Mediterranean travel in our period has been very scarce.[43] For antiquity, on the other hand, intensive scrutiny of the ancient sources and modern replicas of ancient ships have assembled a fair body of data.[44] Things are not too different for the northern seas.[45] Substantial written information has emerged from the sea cities of later medieval Italy and Egypt, although the development of experimental medieval replicas has made less headway in the south.[46] The design of medieval ships may have made them faster. Yet the evidence of actual sea travel has been taken to mean that whatever their capacities, early medieval voyages in the Mediterranean proceeded more slowly than in antiquity. This difference may have been due to some of the structural differences in early medieval sailing – different, especially coastal, routes, which naturally tend to be longer than more direct courses; more frequent and perhaps lengthier port stays, etc.[47] But the most important recent development in the study of medieval shipping speeds has been their systematic reevaluation in the light of modern hydrographic and atmospheric data. Given the intimate interdependence of technology, weather, and geography in shipping before the early modern period, each of the individual reports on which the various estimates of earlier scholars have been founded would require new and close scrutiny in the light of the specific circumstances of the route and ship.[48] The results to date look something like this.

42 Renouard 1968, 2: 684–5.
43 Claude 1995, 1985b, 62.
44 Casson 1995, 281–96; 464–5.
45 E.g., Ellmers 1972, 248–53.
46 E.g., Thiriet 1959, 188–9; Balard 1987; Udovitch 1978.
47 Smaller, faster ships: Unger 1980, 47; see on speed also, Claude 1985b, 62–6; Pryor 1992, 36; cf. Casson 1995, 281–91 and 464.
48 E.g., Pryor 1992, 1–24, 87–101; see particularly his study of Saewulf's pilgrimage to the Holy Land in 1102: 1994; cf. also Pryor 1989.

In antiquity, normal ship speeds of 3.4 to 6.2 knots are recorded for favorable conditions, whereas unfavorable conditions yield approximate speeds of 1.5 to 3.3 knots. The more complicated circumstances of fleet movements are perhaps of special relevance because, as we have seen, early medievals preferred to sail in convoys. They indicate speeds of 0.9 to 4.5 knots.[49] The modern replica of the Kyrenia wreck (c. 300 B.C.) averaged 2.85 knots.[50]

The data from the medieval north is roughly comparable. There, three classes of speeds have been distinguished in the sources: 29 to 37 "etmal" (i.e., sea miles per 12-hour day), which works out to an average speed of 2.4 to 3 knots; 55 to 74 "etmal" (i.e., sea miles per 24-hour day) which works out to the same basic speed of 2.3 to 3 knots; and 90 to 165 "etmal," or sea miles per 24-hour day, which equals 3.8 to 6.9 knots. Trips above 100 etmal are associated with long ships, that is, war vessels. Since days are so long in the northern summer, this indicates, roughly speaking, usual speeds of 2.3 to 4 knots.[51] In the medieval Mediterranean, careful examination of the movements of a Genoese ship sailing from east to west in 1184 has deduced speeds ranging from 0.75 to 3 knots, depending on conditions.[52] The average speed for a fairly representative group of long-distance voyages before the fourteenth century comes out to 1.16 knots against the wind, and 2.25 knots with it.[53] Though lower than the ancient speeds, this may simply be a more realistic sampling than what the ancient sources can supply.

The unique treasure trove of documents preserved by the Cairo Genizah offers a point of comparison for voyages involving the Muslim world, mostly from about 1015 to 1125.[54] Eighteen sea trips documented there yield calculated speeds ranging from 0.65 to 3 knots. Two thirds averaged between 1 and 2 knots.[55] When one considers the Cairo data in the light of prevailing winds, it turns out that trips made with prevailing winds traveled some two to three times faster than those made against them.[56]

A small handful of ship times have been gathered for Byzantium, including a good trip from Constantinople to Cyprus in ten days, a crossing from the northern shore of the Black Sea to Paphlagonia in three days (possibly an echo of an ancient source), a direct crossing from the Crimea to Sinope in five days and nights; and the expectation that it would take three days to sail from Attaleia to Antioch in the

49 Casson 1995, 282–8, including a number of late antique voyages; for fleets, *ibid.*, 292–6.

50 *Ibid.*, 464. For differing views on replicas, cf. Gibbins 1991 and McGrail 1992.

51 Ellmers 1972, 248–53.

52 Pryor 1992, 5–6.

53 *Ibid.*, 36.

54 Udovitch 1978, 507.

55 Assuming a twenty-four-hour sailing day; Udovitch 1978, 510–11. These speeds might actually be too low. To establish the distances, Udovitch relied on the *Table of Distances* 1943: see below, n63.

56 Pryor 1992, 36.

twelfth century.[57] How does this data compare with the new material unearthed by the study of communications in the early medieval Mediterranean?

5. Reconstructing some early medieval voyages

Though widely scattered in the sources, voyages are numerous enough nearly to double the most comprehensive review to date, which was based on the exceptional wealth of the Cairo Genizah. If one includes ship movements of early medieval fiction, the file is even fatter. What we find concerns first and foremost speed of travel, not the speed of ship movements: the time it took to travel from one point to another, including non-specified layovers en route. Since layovers were often a normal part of the structure of voyages, they can and should be included in travel times. This means of course that, insofar as layovers are not specified in the evidence, we are not necessarily looking at the swiftest possible travel times. Rather we are seeing something that, historically, is more valuable: ordinary travel times. We shall begin by looking closely at a few of the best-documented trips and resolving some problems that they pose. Gross speeds calculated in terms of distance covered over time are, by themselves, less illuminating of the true face of travel than a consideration of individual ship movements in light of the sailing conditions along particular sea lanes. We will then work this detailed evidence into the broader context of other early medieval voyages. If change were afoot here too, this should allow new trends to appear. In translating these rates of movement into knots, I shall assume a twelve-hour sailing day. This reflects the consensus view on early medieval sailing; it also facilitates comparison of data from different voyages.

The transport of Pope Martin I to Constantinople, A.D. 653 (Maps 8.1 and 7.3)

Detailed information on the arrest and transport of Martin I from Rome to his doom in the east stems, in a complicated way, from the pope's own autobiographical testimony. As I reconstruct it, the essential features of his trip shed light on a number of issues.[58] Overall, it lasted three months, according to the pope's

57 Kazhdan 1971, 177; Malamut 1988, 2: 552–5.

58 The reconstruction of the trip elaborated by earlier scholars requires modification. What Martin said about the trip comes to us indirectly and in complicated fashion, via two main sources, neither of which is always superior and preferable to the other. Each is complicated. They are:

1 The *Collectanea* translated from Greek by Anastasius Bibliothecarius. Anastasius' version of the collection comprises several different documents, including:

own reckoning.[59] The exact dates of departure and arrival confirm this: Martin was abducted from the Lateran on 18–19 June 653 (see below), and arrived at Constantinople on 17 September.[60] Martin's voyage seems to confirm the conventional wisdom about early medieval navigation and its tendency to hug the coast and make many stops. His own words show that the ship(s) frequently put into shore, where the sailors disembarked and relaxed.[61] The only caveat is that nothing unambiguously identifies the type of ship. The very fact of the frequent landings, and the dramatic circumstances of the abduction and trial of the pope, perhaps hint that he was being transported in a warship, a long ship of the sort whose special configuration obliged it to land very frequently and stick to coastal waters.[62] Plotting a plausible coastal course yields an overall daily travel rate of 15 NM for a twelve-hour day; this works out to an overall average speed of 1.25 knots.[63] The gross rate of travel can be refined.

Footnote 58 (*cont.*)

- letters from Martin I to his sympathizer Theodore, apparently Spoudaios, in Constantinople; one provides a detailed account of his voyage (JE 2079), in PL, 87 and 129.
- the *Commemoratio* (CPG 7969) addressed to the Roman and African churches, ascribed traditionally to Theodore Spoudaios c. 654 (who witnessed many of the events he describes), and preserved only in Anastasius' translation of the *Collectanea*. For a slightly earlier date, see P. Chiesa, *Aevum* 66 (1992), 456–9. Chiesa 1992, 212–13n4 has questioned the authorship.

2 The Greek biography of Martin I, *Vita Martini graeca* (BHG 2259), the attribution of which to 8th-C. Greeks at Rome (Mango 1973, 703–4; cf. Sansterre 1983, 1: 138–9), has been seriously challenged by Conte 1989, 238–49, who instead suggests Jerusalem. It appears to have abridged and sewn together the Greek text of several documents transmitted also in Anastasius' Latin *Collectanea*: Devreesse 1935, esp. 54–5n1. See Chiesa 1992; on the letters, Cremascoli 1992.

59 JE 2079, PL, 129.590C (*apud* Anastasius Bibliothecarius' *Collectanea*).

60 Theodore Spoudaios, *Commemoratio*, PL, 129.592B–C; *V. Martini gr.*, 6, p. 258.

61 JE 2079, PL, 129.590C = *V. Martini gr.*, 5, p. 257, cf. 6, p. 257; PL, 129.492B–C. See below for the details.

62 On these characteristics: Pryor 1992, 37–8 and 69–71.

63 I reckon about 1,390 NM from Rome to Constantinople as I reconstruct a coastal course which takes into account the places mentioned in the sources and early medieval custom along this route at this time. 1390 NM ÷ 91 days = 15.27 NM/day on a 12-hour schedule. Previous scholars have used *Tables of Distances between Ports*, such as that published by the US Navy in 1943: thus Udovitch 1978, 511n. However, as *Table of Distances* 1943, 3, states, they give the "shortest navigable routes" for 20th-C. (war)ships. For such vessels, with vastly different power, draft, and technology, "navigable" refers to a different world from the early middle ages. For instance, *Tables of Distances* 1943, 111, gives the distance from Civitavecchia (the modern, very small port of Rome, some 27 NM north of the Tiber) to Messina as 302 NM, yielding a distance from the Tiber to Messina of c. 275 NM. Measuring along the shore gives a coastal route of about 355 NM, i.e. a course which is a sixth longer. So too *Tables of Distances* 1943, 171, gives the distance from Haifa to Alexandria as 294 sea miles. The blue-water distance between these two ports is about 270 NM as the crow flies. A coastal itinerary comes to c. 335 NM, i.e. it is about 15 percent longer. When dealing with coastal traffic, it is usually preferable to work out rough distances from charts and maps of the region, rather than to accept modern courses. This is what I have done. The naval tables are chiefly of interest for deep-sea courses.

First we can reconstruct the river trip down the Tiber to Portus. The imperial officials charged with arresting Martin manifestly faced a dangerous situation, and avoided a public confrontation at Mass on Sunday, 16 June 653.[64] The correct date and hour of the pope's arrest and removal from Rome by small boat is midnight of the night of Tuesday–Wednesday 18–19 June. This reveals the hitherto hidden secret of the Byzantine officials' plan: there was a full moon. If the night were clear, as one would expect in central Italy in late June, the moonlight will have illuminated the Tiber as the small boat and its prisoner worked their way downstream, while imperial forces blocked the gates of Rome to prevent pursuit of the escaping arrest squad.[65] The river trip took ten hours and covered at least some 23 to 26 km, that is, 12.4–15 NM, yielding a river speed approaching 1.5 knots.[66] The boat will have been traveling faster if the twists and turns of the river made it longer in the seventh century. Although slow, 1.5 knots is not impossible: there is no reason to think late Roman engineering standards were maintained in the seventh century, so that the boatsmen will have had to watch carefully for mudbanks and logs. Whether locals or imperial sailors, they navigated by moonlight

64 JE 2079, PL, 127.588D.

65 *V. Martini gr.*, 5, p. 257, erroneously dates the abduction to a Wednesday 17 June (which is impossible), toward dawn (ἐπιφωσκούσῃ ἡμέρᾳ τετάρτῃ). Peeters determines (*ibid.*, pp. 235–6) the correct date of that Wednesday as 19 June, but mistakenly places the abduction toward dawn. JE 2079, in Anastasius Bibliothecarius, *Collectanea*, PL, 129: 590A–B, suggests rather the author's attempt to make clear that it was the night of Tuesday which turns to light at the dawn of Wednesday. Martin's own eyewitness testimony places his abduction in hour six of the night from Tuesday (18 June) to Wednesday morning, that is, midnight. According to 653's Golden Number, the new moon should have appeared on 3 June in 653, producing a full moon in the night of 18 June. For the Golden Number, etc.: Ginzel 1906–14, 3: 136 and 396. The type of boat was, according to Anastasius, a *levamentum*: JE 2079, PL, 129.590A–B, on which term, above, Ch. 13n64. This the Greek seems to render as *ploiarion*: *V. Martini gr.*, 5, p. 257.

66 Typically, even so simple a matter truly can get complicated. From the site of Portus to downtown Rome is c. 26 km by modern road; the Roman itineraries indicate 19 Roman miles (Radke 1971, 63), i.e. 15 NM. Procopius gives the distance as 126 stadia, i.e. 23 km (12.4 NM): *Bella*, 5, 26, 4–5, 2.128.6–13; it is unclear whether he is referring to the road or river distance, although his description suggests that the road may be the towpath described at *Bella*, 5, 26, 9–11, 128.25–129.14. The early medieval Tiber may have been longer, and it is possible that the ship awaiting Martin was still more distant, on the coast, which is another 3 or 4 km away today (Procopius identifies Portus as 15 stades from the sea in his time, i.e. 2.7 km). This would make c. 26 km in all.

all the more gingerly for the fact that their lives would not have been worth much if they had run aground and been detected.

The next segment of the trip is the most precisely documented. The pope was transferred to another vessel at Portus (Porto Romano). It got under way immediately on 19 June, around 10 A.M., and reached Messina on 1 July (Map 16.1).[67] It took thirteen days to travel 355 NM, that is, 27 NM per day, yielding an average travel speed of 2.25 knots, if sailing was confined to daylight hours. At this time of year along this route, the prevailing winds and currents should have been favorable, and the use of the land and sea breezes would have made it an easy stretch.[68]

The next leg is less fully documented. Martin probably was put into another ship in Messina's harbor.[69] The trip to Constantinople took something under seventy-eight days. The 1,040 sea miles imply average daily distances of some 13 NM, for an average travel speed of about 1 knot. This travel speed falls considerably short of the ship speed however. We do not know how long the ship stayed at Messina, or at the numerous other landings to which Martin alludes, in Calabria (very probably Reggio, 6 NM beyond Messina across the dangerous strait, or Crotone, or both), on "many islands," or at Abydos (Map 7.3). The sailors disembarked and relaxed regularly.[70] A considerable delay occurred on Naxos. Given its location and the season, this very probably arose during a *meltemi*, that strong wind which stymies northbound Aegean sailing at this time of year.[71] From

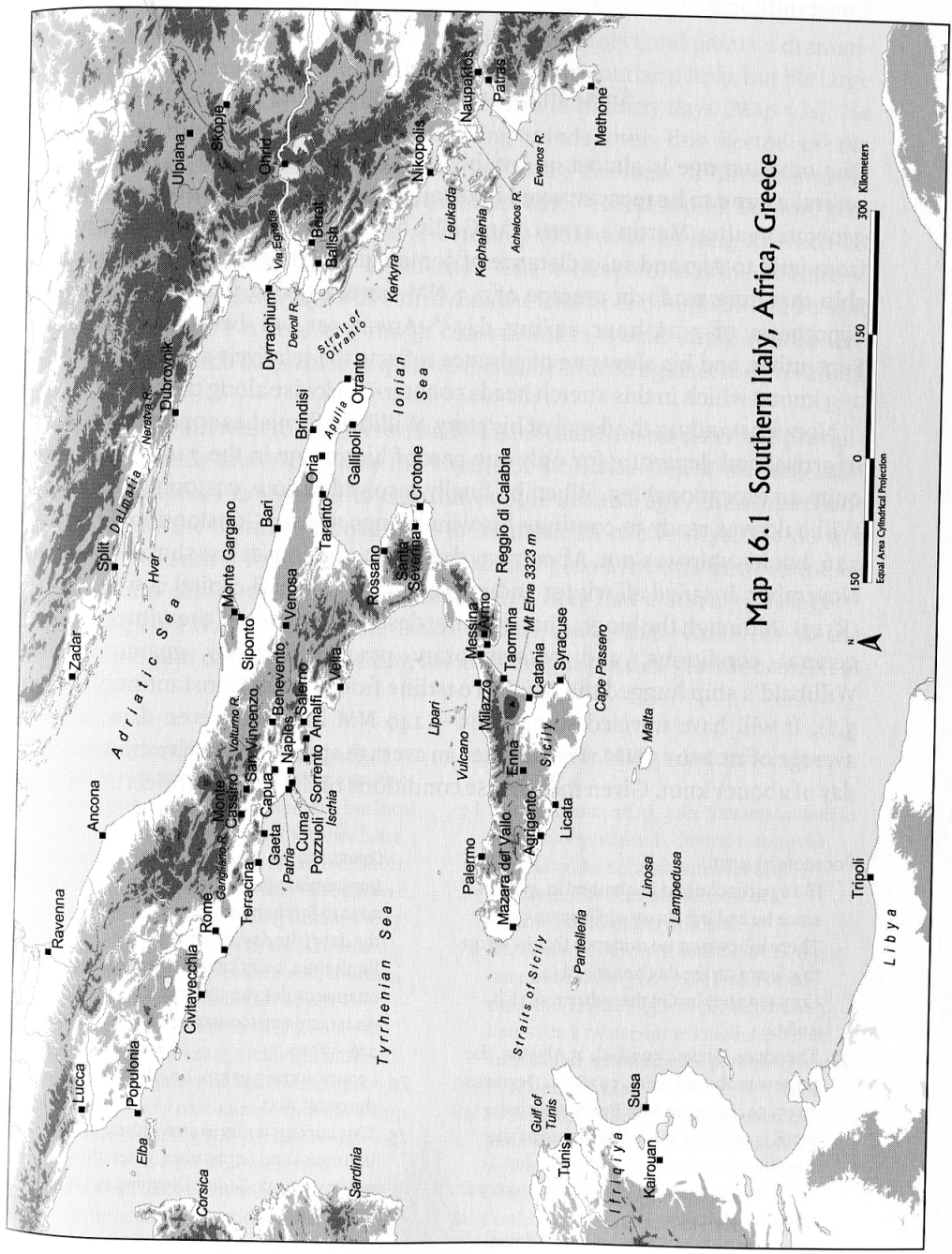
67 After the fourth hour of the day. This seems late given the diurnal patterns of land and sea breezes (cf. above, p. 426). Does it hint that Martin was transported aboard an oared warship? Aside from the issue of ship size, Martin implies a transfer when he states that baggage which had been placed in the *levamenta* at Rome had to be left in Portus: JE 2079, *PL*, 129.590B.

68 See *Mediterranean Pilot* 1978–88, 2, Diagrams 2, 7 and 8, and p. 14 (1.98).

69 The letter's phrasing suggests Martin changed ships in Messina ("pervenimus . . . Mesenam in qua erat navis, id est carcer meus," JE 2079, *PL*, 129.590B–C), although Peeters prefers to see this as poor translating by Anastasius: 1933, 236. The Greek *Life* does not fit the phrasing of the Latin closely enough to support Peeters on this.

70 Stops in Calabria and "many islands," *PL*, 129.590C =*Vita Martini gr.*, 5, p. 257, cf. 6, p. 257.

71 Naxos: the Latin expression of Anastasius' translation of Martin's letter ("annum fecimus" in Naxos, *PL*, 129.590C) is manifestly a calque of the late Greek expression *chronotribēsantes* (*V. Martini gr.*, 5, p. 257), i.e. they "spent time," "were delayed." Cf. Peeters 1933, 236, who accepts the explicit statement of the *V. Martini gr.* 5, p. 257, that they sailed for forty-seven days after a delay on Naxos (*ibid.*), and they arrived in Constantinople on 17 September (6, p. 258). This is implausible. If they had indeed taken forty-seven days to sail *from* Naxos to Constantinople, the most substantial delay would have occurred *after* Naxos. But the pope singles out Naxos as the place where they were delayed, and the subsequent description of the Life becomes incoherent, as Devreesse 1935, 54–5n1 makes clear. The forty-seven days of the Greek Life seem to derive from Martin's statement on the day he wrote



Abydos a messenger hurried north to alert the emperor of the captive's impending arrival.[72] Finally, on 17 September, the pope's vessel put into port at Constantinople.[73]

Some other early medieval voyages

One other voyage is almost as lavishly documented as Martin's, and parts of several more can be reconstructed in detail sufficient for our purposes. About a generation after Martin's arrest, the Gallic bishop Arculf took forty days to sail from Jaffa to Alexandria, a distance of some 290 sea miles along the coast. His ship therefore made an average of 7.3 NM travel per day, or 0.6 knots on the hypothesis of a 12-hour sailing day.[74] Arculf set out between 14 and 22 September, and his slow rate of advance reflects the relatively strong current (c. 2–3 knots) which in this stretch heads counter-clockwise along the coast.[75]

Notwithstanding the detail of his story, Willibald furnishes approximate dates of arrival and departure for only one part of his voyage in the 720s, and that is quite an exceptional leg. When he finally resolved various customs difficulties, Willibald was ready to continue his wanderings toward Constantinople late in 726, but his ship was not. After many days' wait, the ship at last shoved off on 30 November. It sailed all winter and arrived in the imperial capital c. 6 April 727 (R117). Although the biographer does not describe the course, the winter season, general conditions, and contemporary practice virtually guarantee that Willibald's ship hugged the Asiatic coastline from Tyre to Constantinople (Map 5.1). It will have traveled some 1,185–1,240 NM in ninety-seven days, a daily average of 12.2 to 13 NM. This implies an average speed for a twelve-hour sailing day of about 1 knot. Given the adverse conditions of the season, the certainty that

Footnote 71 (*cont.*)
JE 2079 that he had not bathed in 47 days, since he had left Naxos: *Collectanea* 590C. There is however no evidence that he wrote this letter on the day he arrived in Constantinople. On the *meltemi*, see Ch. 4n63.

72 Theodore, *Comm.*, 592B–C; at Abydos, the pope was abused: *ibid.*, 592B; cf. Devreesse 1935, 54. I concur with Duchesne that a word is missing at the beginning of the troublesome clause, e.g., "<nisi> in insulam quae vocatur Naxos." Chiesa 1992, 220n21, hesitates.

73 *Vita*, 6, p. 258; cf. Theodore Spoudaios, *Comm.*, 592C: "in portum juxta Euphemiam prope Arcadianon." The reference to Euphemia seems to be a gloss on the date (the day after the feast of St. Euphemia, a day laden with ideological resonance under the circumstances) that Anastasius misconstrued: Chiesa 1992, 216–17n10.

74 I count some 540 km, i.e. 292 NM along the coast, R41.

75 This current tends to strengthen precisely in August and September, when the Nile's outflows peak: *Sailing Directions* 1992, 44; cf. Pryor 1992, 119.

some days at least must have been spent ashore awaiting better weather, and the fact that Willibald's ship was sailing against unfavorable winds much of the way, this is a respectable rate indeed.[76]

A century and a half later, another pilgrim to the Holy Land paints a dramatically different picture. Bernard also boarded a ship in southern Italy, but his large slaver sailed from Taranto and reached Alexandria in thirty days (Map 5.2). He traveled in the direction of the prevailing winds over this sector of the Mediterranean; if we imagine that he sailed along the coast of Greece and via Crete, his ship will have made about 29 NM per day.[77] Homebound, Bernard presumably boarded a ship at Jaffa, and certainly took twice as long to reach an unspecified port in the vicinity of Salerno – one is tempted to think of Amalfi. Bernard notes that the voyage was stormy, and he speaks as though he had been at sea continuously.[78] A course through coastal waters would imply somewhere around 35 NM each day, which is quite respectable indeed against the prevailing winds.[79]

That trips from west to east were usually faster than those against the prevailing winds is only underscored by the voyage of St. Blaise. When the holy man and his disciples immigrated to Constantinople around 892, their merchant ship covered the distance from Rome to Methone in twelve days. We do not know the season; a following wind is certainly possible both from Rome to Messina and across the Ionian Sea (Map 16.1); they had a stormy passage.[80] Assuming that they followed the usual coastal route, this works out to the remarkable sum of c. 63 NM per day, for an average speed of 5.2 knots on a 12-hour day.[81]

76 According to *Sailing Directions* 1992, 84, north winds prevail along Turkey's south coast from November to February, but local conditions vary greatly. On the other hand, the current will have been favorable. Short-term weather conditions may have allowed some short cuts. The *Table of Distances* 1943 reckons the distance between Beirut and Istanbul at 848 NM via the usual, shortest, high-seas route suitable for a 20th-C. warship. Tyre lies about 50 NM south of Beirut along the coast, yielding a minimal combined distance of 898 NM, so that even by this unlikely reckoning, Willibald's ship will have made c. 9 NM per day, or 0.8 knots on a 12-hour sailing day.

77 R580. I calculate a distance of c. 865 NM with the landfalls mentioned, i.e. 29 NM per day and an average speed of 2.4 knots on a 12-hour sailing schedule. See also Table 16.3.

78 Bernard, *Itin.*, 20, p. 318: "*Intrantes* autem in mare, navigavimus lx dies cum angustia magna valde, non habentes ventum serenum. Tandem *exeuntes* de mare, venimus ad montem Aureum . . ."

79 A traditional northern coastal route might have been as long as 2,085 NM. For 60 days, this implies 35 NM per day, i.e. c. 3 knots (on a twelve-hour schedule) which seems high, given that the prevailing winds were unfavorable.

80 *V. Blasii* 19, 666B: *perikluzomenoi*; see *Mediterranean Pilot* 1978–88, 2, diagrams 7–8 for wind patterns in April, July and October; cf. *ibid.*, 1: 18 and 3: 26.

81 I estimate the coastal route at c. 750 NM.

Theodore Studite's eyewitness account of his voyage into exile details an early spring trip through the Aegean, and provides a qualitative assessment that enhances its value. The first sea stretch came in early March, after a week's delay due to unfavorable winds. The sail from Eleountes (class. Elaious, mod. Eski-Hisarlık, near Eceabat, Turkey, on the northern shore of the Dardanelles) to Lemnos was fast: the ship covered about 45 NM in nine hours. To Theodore, this speed of five knots was so fast it seemed as if they were flying.[82] If anything, the next leg was even faster: the wind whistled like an arrow through the air and drove them to Cape Paliouri in only twelve hours. A straight course from Hephaisteia would have covered c. 80 NM, implying a remarkable speed of 6.6 knots. Theodore anticipated that his reader would wonder at this non-stop sail, for he explains that they feared the people on the shore, surely a reference to the devastating attack that the Bulgars had inflicted on a Byzantine general in the Strymon area just a few years before.[83] As Theodore intimates, these were exceptional speeds, and they were kept up only for a few hours.

Liudprand of Cremona's trips to Constantinople complete the picture of precisely documented travel speeds along the routes of greatest interest to us. He treats his voyage from Venice in August and September 949 matter-of-factly, giving no hint of anything but a commonplace crossing. This twenty-four-day trip implies a daily performance of about 53 NM, and an average speed of 4.44 knots for a 12-hour day.[84] The return trip of Liudprand's legation of 968–9 has already thrown light on winter sailing. It also yields some precise speeds. From the Euenos river to Leukada required four days of calm seas in early December 968. Sticking close to shore (where the current would have been generally most favorable), the distance comes to about 70 NM. This translates into about 18 NM per day, or an average speed of 1.5 knots for a 12-hour day.[85] That this is on the

82 Ep. 3, 14.95–6: *epetasthēmen*. For the places and dates, *ibid.*, pp. 143*–146*. The reference to the bishop's hospitality implies that they landed at Hephaisteia, the island's capital; cf. R234.

83 Theodore Studite, Ep. 3, 15.99–102; Theophanes, A.M. 6281, 1.463.28–464.2. Theodore claims this was a distance of 150 miles. That is impossible with the standard Byzantine mile (1,574.16 m: Schilbach 1970, 32–6); it might fit roughly with the hypothetical mile of 1,217 m. deduced from the Hexamilion on the isthmus of Corinth (*ibid.*, 35–6), but, so far, without further support. That Liudprand's estimate of a sea distance errs in similar proportion (below, n85) suggests that there may have been a kind of Byzantine sea mile, whose existence has so far eluded detection.

84 R816. I calculate the distance as 1,280 NM, based on measuring the maps and the table of distances for yacht traffic in the Adriatic: Simovic 1986, facing p. 1. *Table of Distances* 1943, 457, gives 1,176 NM, while Ellmers 1972, 250 arrived at 1,310 NM.

85 *Legatio*, 59–61, 207.22–208.36. Current: *Sailing Directions* 1992, 148; cf. *Mediterranean Pilot* 1978–88, 3: 141–2. Liudprand reckons this as 140 miles, which is impossible in standard Byzantine terms. But see above, n83, on Theodore Studite's approximately similar miles.

mark is suggested by the key coordinates of the next leg, which took Liudprand from Leukada to Kerkyra over four more days. The distance is again about 70 NM, which reflects the same daily rate and average speed.[86]

6. A ninth-century shift?

Although these eight voyages are among those which supply the most details about ship and travel speeds in the early Middle Ages, they are not the only ones. If we summarize their data, add to them other securely attested speeds of sea travel, and rank the result by increasing average speed, the whole suggests a shift in the ninth century (Table 16.3).

The lesser distances traversed in trips 1 and 2 clearly reflect unfavorable circumstances, just as the explicitly remarkable speeds of the short trips 16 and 17 are due to exceptionally favorable ones. Trips 3–8, with their average speeds of 1.25 to under 2.3 knots fit best with the general pattern observed by Pryor (average of c. 1.16 knots against the wind, and 2.25 knots with it) and the predominance of speeds of 1 and 2 knots in the Genizah materials. Trips 9–15, on the other hand, exceed both the first range and those later medieval averages with which trips 3–8 fit so smoothly. Generally speaking, this second group doubles the rates of movement of the first group. Unusually favorable conditions? This is possible but, except for trips 16 and 17, the sources do not tell us so. The loquacious Liudprand makes no comment on the speed of his trip in 949, and although its direction fitted that of the normally prevailing winds, Blasius' trip appears in fact to have been made under difficult, stormy conditions. Nor is any technological innovation known from the ninth century which could explain that ships could suddenly sail twice as fast.

The solution is much simpler. Two different clues point us in the right direction. One lies in the fact that the rates of movement of the second group approximately double those of the first group. Another emerges from closer inspection of the circumstances of the second group of voyages. Trip 13 is particularly noteworthy because it involved a fleet, which usually moved more slowly than individual ships: the slowest ship sets the pace. What is more, the necessity of maintaining a formation, indispensable in the case of a hostile landing, would suggest that these numerous ships added another complexity to the maneuvers. The explanation lies in the course. The invasion fleet sailed from the Bay of Susa to the mouth of the Mazaro river on the southern coast of Sicily. Whatever course one plots, the fleet was at sea for a minimum of some 45 and as much as 65 NM. The fleet had no choice but to sail day and night to cross

86 *Legatio*, 61–3, 208.30–210.25.

TABLE 16.3
Average rates of travel for fifteen early medieval voyages, ranked in increasing order of average speed

NM per day	Average speed in knots*	Date	Trip	NM	Duration (days)	Comments	Traveler	No.
7	0.60	14 September–October c. 681–7	Jaffa–Alexandria	290	40	east–west; against current, prevailing winds	Arculf	1
12	1.00	30 November 725–c. 6 April 726	Tyre–Constantinople	1,185	97	east–west; against winds?	Willibald	2
15	1.25	19 June–17 September 653	Portus–Constantinople	1,390	91	west–east; meltemi?	Martin I	3
18	1.45	2–6 December 968	Euenos river–Leukada	70	4	south–north; winter, calm sea	Liudprand	4
18	1.45	14–18 December 968	Leukada–Kerkyra	70	4	south–north; winter	Liudprand	5
< 26	< 2.16	c. 709	Ravenna–Constantinople	1,285	> 50	west–east; a miracle occurred on the 50th day of the voyage	Felix	6
27	2.25	19 June–1 July 653	Portus–Messina	355	13	north–south, with prevailing winds	Martin I	7
< 28	< 2.30	c. 692–708	Ravenna–Constantinople–Ravenna	2,570	> 91	west–east and back; estimated round trip: (somewhat) more than 3 months	exarch	8
≥ 29	≥ 2.40	22?–26 August	Ischia–Rome	115	≤ 4	south–north; urgent message	news of attack	9
29	2.40	c. 867	Taranto–Alexandria	865	30	west–east; large slaver	Bernard	10
< 35	< 2.90	27 June 813–?	Zadar–Constantinople	1,120	> 32	west–east	Amalarius	11
35	3.00	867	Jaffa–Salerno	2,085	60	east–west	*Bernard*	*12*
48	*4.00*	*14–17 June 827*	Susa–Mazara	145	3	south–north; invasion fleet	Asad	13
53	4.44	25 August–17 September 949	Venice–Constantinople	1,280	24	west–east	Liudprand	14
69	5.75	c. 892	Rome–Methone	830	12	west–east; stormy weather	Blaise	15
45	5.00	March 793	Elaiountes–Lemnos	45	9 hours	"flying"	Theodore Studite	16
80	6.60	March 793	Lemnos–Cape Paliouri	80	1	strong wind blowing northward	Theodore Studite	17

Note:
*Assuming a twelve-hour day.

the straits of Sicily.[87] It suffices to recognize that, in like fashion, trips 14 and 15 kept to sea most days and nights, to understand the doubling of daily distances which they record. This is exactly the pattern in the contemporary northern seas, and is so explained in a record from King Alfred's court.[88] This was in any case inevitable for the part of voyage 15 that ran across the strait of Otranto. By the same token, the same explanation makes clear how Bernard's return trip from the Holy Land – for which he seems to say that he did not get out of the ship between the Levant and Italy – could log, against the wind, the remarkable daily distance of 30 NM. Reckoned on a twenty-four-hour sailing day, his sea speed drops to a more plausible 1.5 knots, in close conformity with Pryor's findings of an average speed of 1.25 knots against the wind.[89]

It is, moreover, notable that all the long voyages with consistently longer daily distances occurred in the ninth century or later. If the chronological distribution is reliable, the structure of navigation experienced another critical change. Alongside the purely coastal, mostly daylight sailing which appears to have prevailed in the later seventh and eighth centuries, twenty-four-hour sailing regains importance. Even if this sailing kept to coastal waters, it will have halved effective travel times. In this regard, while we may suspect that Liudprand boarded a merchant ship in Venice in 949, we can be certain that Blaise sailed aboard one c. 892 (R729). A type of sailing which had declined in frequency since the early seventh century, regained currency in the ninth.

The implication is important. We have already seen much of the more typical early medieval culture of navigation, a seaman's world in which ships were beached every night and dinner cooked on shore, and which supposes an intimate knowledge of the shorelines along which one coasted. But above all, this sailing style implies, almost inevitably, a greater regional specialization in

87 Even if the fleet stopped at Pantelleria en route to Sicily – not impossible though unrecorded – the shortest crossing from Cape Bon to Pantelleria is about 45 NM; if they did not call at Pantelleria (the shorter overall distance, which is what I have used for the speed calculation), the fleet will have been at sea for a minimum of 65 NM, from Cape Bon to Mazara del Vallo.

88 Ellmers 1972, 249, using the Old English Orosius.

89 Another 8th-C. voyage across the strait of Otranto shows high speed correlating with round-the-clock sailing, but the precise course is uncertain and yields only a range of speeds. A Beneventan ambassador sailed from some port in Apulia through a terrible storm, and arrived safely in an unspecified port on the next day and disembarked: *Translatio S. Heliani* (BHL 3799), 581.15–582.10. If the unnamed ports were Siponto and Dyrrachium the ship covered 162 NM, making 6.7 knots on a twenty-four-hour schedule; of course we do not know when on the next day he arrived, so the actual lapsed time could have been greater and speed somewhat less (e.g., arrival late the following day = 36 hours, 4.5 knots). A less likely alternative (see R167) is Bari–Dyrrachium or Siponto–Dubrovnik, 119 NM, i.e. 4.96 knots on a 24-hour schedule.

navigation, a smaller operational radius, than a culture of navigation which confines its landings to a small number of distant ports. In such a regional world, the *system* of long-distance transport would consist of interlocking smaller spheres of navigation. But the study of the rates of movement of our ships alerts us to the reemergence of another culture of navigation. Let me be clear. The reemergence of continuous sailing will not have been a total novelty, nor will its success have been complete.[90] Indeed, in some attenuated form, tramping persists in the twenty-first-century Mediterranean. It is rather a question of the changing proportion of ships which are engaged in increasing stretches of continuous sailing, the first step toward a reemergence of blue-water sailing beyond the sight of land. In economic terms, such a trend toward more round-the-clock sailing would not have been inconsequential. For it would have increased the effective range of ships, as well as the velocity with which goods were moved. Both, potentially, might increase the profits the masters could make.

Southern Italy's hagiographical novels extend and deepen our knowledge of assumptions about normal travel times. Ten more trips come from the Life of St. Gregory of Agrigento.[91] The Greek-speaking author appears to have been a monk in Rome – he certainly knew the city and its churches – and was writing c. 800. Given Rome's frequent contacts with Sicily, we would expect him to be most familiar with shipping patterns linking the two regions, and he does show first-hand knowledge of southern Sicily. Although, as our prosopographical study has already shown, a Greek monk active at Rome at this time will have experienced first-hand the arrival of travelers from the east, his detailed knowledge of traffic from Constantinople or points further afield might be less authoritative.[92] For seven voyages mentioned in this Life, the most likely route is pretty clear; for three others (nos. 7–9), I have identified the most plausible among several possibilities (Table 16.4).

Broadly speaking, the data are coherent and compare favorably with the data we have found on actual voyages. According to the author, trip 1 involved delays, and it works out to the slowest average speed for a 12-hour sailing schedule. The trips about which the author must have been best informed are slow, given the generally easy sailing conditions down the coast of southern Italy. The two fastest

90 Claude 1985b, 60–1 has assembled the evidence for occasional early medieval night sailing. It is worth noting that all of his sources save one date from before c. 650. The exception is the *V. Gregorii Agrigenti*, on whose travel times, see below.

91 See already on the *Life*'s travel speeds Claude 1985b, 64 (who accepted the *Life* as an essentially valid historical source of c. 600); in his introduction to the *V. Gregorii Agrigenti*, Berger, pp. 51–2, also analyzed its data on travel conditions.

92 Thus Berger, *ibid.*, p. 51. Against his assertion (50n110) that every Greek monk in Rome – and thus this author too – necessarily came from Byzantine Italy, see above, Ch. 8.2.

TABLE 16.4

Rates of movement: voyages in the *Vita Gregorii Agrigenti* (BHG 707; cf. Map 16.1)

NM/ day	Speed* (knots)	Dates	Trip	Distance (NM)	Duration (days)	Comments	Reference	No.
c. 13	c. 1.08	after 10 June–14 September	Agrigento–Constantinople	1,210	c. 96	west–east; delayed	232.15–17	1
≥17	c. 1.42	after 10 May–10 June	Rome–Agrigento	530	≤31	north–south	232.11–12	2
18	1.5	c. 10 August–10 September	Rome–Agrigento	530	30	north–south	263.5–10	3
19	1.6	16 August–10 September	Rome–Palermo	465	25	north–south	202.15–16	4
20	1.66	27 June	Licata–Agrigento	20	1	north–south	164.7–9	5
26 to 40	2.16 to 4.5	departs after 12 May, arrives before 15 June–20 July	Constantinople–Rome	1,405	54–35	east–west	262.1–263.2	6
36	3	1–15 June	Tripoli–Licata	540	15	south–north; coastal route reckoned via Sfax, Malta	164.1–6	7
58	4.8	?	Rome–Carthage	580	10	north–south; course reckoned via Sicily; "διὰ δέκα ἡμερῶν"	174.27–8	8
68	5.6	30 June–2 July	Agrigento–Carthage	205	3	north–south; coastal route reckoned via Mazara and Pantelleria; favorable wind; "μετὰ τρεῖς ἡμέρας"	150.16	9
70	5.8	c. 12 September–14 September	Palermo–Agrigento	140	2	north–south; "favorable wind," "δύο ἡμερῶν"	203.17–19	10

Note:
*Assuming a twelve-hour day.

rates of movement are also the shortest voyages (nos. 9–10), as was true for the historical trips of Table 16.3. What is more, the author explicitly recognizes them as favored by the winds. Outside these exceptionally fast and short voyages, the rates of movement again fall into two groups, of which the faster (nos. 6–8) approximately double the slower (nos. 1–5). Like the historical voyages, trip 7 both covers longer daily distances, and necessarily implies a minimum of two stretches of 75 NM without landfall that dictated a twenty-four-hour sailing schedule.[93] One of the fastest trips (no. 9) also fits this pattern, for even if a ship coasted along the southern shore of Sicily to Mazara, there was no escaping twenty-four-hour sailing for over half of the course, from Mazara to Pantelleria and then on to Cape Bon, distances of c. 65 and 45 NM respectively. What is more, this three-day crossing substantially corresponds to Table 14.3, trip 13, which also occurred in June, albeit in the opposite direction.[94] If the sea speed for movements 6–10 is reckoned on a twenty-four-hour sailing day, they fall back within the normal parameters attested by historical voyages. In trips 8 and 10, the exact phrasing of the Greek reinforces our conclusion about why they covered greater daily distances.[95]

In sum, the ten voyages described in the Life of Gregory of Agrigento conform to the general pattern of the historically attested trips. They also suggest that some twenty-four-hour sailing may already have been occurring in the decades on either side of 800. Like the earliest historical example from the ninth century, moreover, two out of three cases of likely twenty-four-hour sailing concerned trips which necessarily involved the high seas.

To round out this excursion into early medieval fiction, Table 16.5 gives the data from three more south Italian romances. One is inclined to suspect that most, and perhaps all, of these performances involved twenty-four-hour travel, the more so that trips 2 and 3 sailed into the teeth of the prevailing winds, trip 1 inevitably involved a lengthy leg of high seas sailing, and trip 2 explicitly included night-sailing, at least at the outset, and an imperial command to spare no effort for speed. Trip 4, which is the highest daily average I have yet encountered in this kind of source, perhaps involved a special display of divine favor. In any case, we are explicitly told this time that they sailed around the clock. This reduces the real

93 The blue-water legs are from Africa to Lampedusa and from Linosa to Malta.

94 As Leslie Dossey pointed out to me, the presumably late antique *Passio Felicis Tubzacensis* (BHL 2895), 270.14–23, preserves an account of a four-day voyage from Carthage to Agrigento. The itinerary thereafter is Catania, Messina, Taormina and Velia, and then overland to Venosa.

95 In both cases, the Greek suggests that the trip was accomplished through continuous sailing. *Dia* with the genitive in classical Greek carries a nuance of uninterrupted duration which is not entirely lost in modern Greek, e.g., Thumb 1964, 104. The other travel times are expressed by arrival and departure dates or, for trip 9, with the preposition *meta* (150.16).

TABLE 16.5

Rates of movement: voyages in the southern Italian hagiographical novels

NMI/day	Speed* (knots)	Date	Trip	Distance (NM)	Duration (days)	Traveler	Comments	No.
30	2.50	"apostolic age" (9th–10th C.)	Alexandria–Andros	445	15	St. Leucius	south–north; course reckoned via Crete	1
39	3.25	9th C. (c. 815–29)	Constantinople–Catania	1,175	30	Byzantine official	east–west; sailed that very night, διὰ νυκτός and fast	2
43	3.50	iconoclast?	Naxos–Naples	945	22	St. Nicon	east–west	3
113	9.40	same	Chios–Mt. Ganos	225	2	St. Nicon	south–north; ship sailed for 2 days and 2 nights	4

Note:

*Reckoned on a twelve-hour sailing day.

Sources: 1. *Vita Leucii* (BHL 4894), p. 364. 2. *V. Leonis Catan.* (BHG 981), 8, 90.1–91.9. 3, 4. *Passio Niconis* (BHG 1369), 10 and 6–7, respectively, *16F and B–C.

average speed to an impressive but still believable 5.2 knots. Reckoned on a twenty-four-hour sailing schedule, the 3.25 knots of the Life of Leo of Catania drops to about half that, and so approaches the pattern established for other voyages which, for long stretches, sailed against the prevailing winds.[96]

◇

And so change affected the total number of shipping and other movements we can detect, it affected their seasonality, and it affected, for some ships, the rate of travel. The durations of embassies hinted that some things changed in the ninth century. Speeds of land travel, on the other hand, look unexpectedly stable throughout the Middle Ages, at least as far as the links with Italy are concerned. Historical sources yielded a surprising number of voyages whose rates of movements can be calculated. The hagiographic novels generally reinforce the historical data. Much sea travel moved at rates which are slow, implying daily distances of some 15–25 NM; less favorable conditions, naturally, produce lesser daily distances. A significant number of voyages record performances above, and even well above, that daily range. The highest performances are explicitly attributed to exceptionally favorable conditions. But there is reason to believe that a good part of the lengthier daily trajectories are due simply to the decision to stay at sea at night. This had the effect of doubling overall rates of movement at sea while requiring minimal technological change. Is it an accident that most of the evidence for longer daily stretches comes from the ninth and tenth centuries? It converges felicitously with the change in expected duration of embassies from Italy to Constantinople, which seems to have dropped from around eleven months in the middle of the eighth century to around eight months 100 years later. Of course, the move toward round-the-clock sailing only affected part of the shipping plying the early medieval Mediterranean; the older style of nightly landings persisted alongside the newer trend.

As movements increased, some also quickened. No major technological change, but rather a change in sailing culture allowed the acceleration: an increasing number of ships, on an increasing number of occasions, preferred to

96 Pryor 1992, 36. I have not included a rich but controversial source that offers remarkable data on sailing patterns in the eastern Mediterranean. John Kaminiates' *De expugnatione Thessalonicae* claims to be an eyewitness account of the capture of Thessalonica and transport of its population into slavery in July 904. A. P. Kazhdan (1978) maintained that its narrative style and realia are out of step with the early 10th C. and suspected it to be a 15th-C. fabrication inspired by the Ottoman advance; contra: Tsaras 1988. According to Christides 1981, a late Byzantine forger incorporated a lost authentic account, particularly for the navigational details. For now, it seems wiser to refrain from building on this source. Its raiding fleet mostly sailed on a twenty-four-hour schedule, averaged a fleet speed of around 2 knots when under way, and mixed coastal sailing with blue-water courses.

sail day and night, and thereby doubled the distances they could routinely cover. We will need to consider what historical, and perhaps especially, what economic forces might have encouraged skippers who were not acting under imperial orders to shift toward a different structural pattern of their voyages, and what the consequences of such a growing shift might have been. Were there more cargoes that were more fragile? Was demand increasing on one or both sides of the water, providing an incentive to quicker trips? But first we need to scrutinize our early medieval travelers' movements from another angle, that of routes.

17

"Spaces of sea": Europe's western Mediterranean communications

In Charlemagne's day, travel to Constantinople meant salt water. "Crossing the spaces of sea," was how a court poet imagined the king's daughter would get to Byzantium, while *Sea Verses* seemed an apt title for a poem about Amalarius' trip a generation later.[1] The Mediterranean Sea has dominated scholars' investigations of early medieval communications no less than royal courtiers' imaginations. Rightly so, since the Roman communications that once coursed along the continental corridors of the Danube or the Via Egnatia had ceased entirely in the seventh century (Ch.3.2).

In the age of Charlemagne and Harun al Rashid, what *routes* funneled contacts between eastern and western areas of what had been the Roman empire?[2] Routes, we sometimes imagine, are predetermined by geography. Physical geography and climate do in fact define the possibilities. But they do so in complicity with human technology and culture, as historical developments affected which possibilities would be exploited. So far, the history of routes has played little part in the debate over long-distance trade in the early Middle Ages. Yet we have seen that routes changed. A systematic analysis of the spatial patterns of travelers' movements forces a new appraisal of the geographic structure of Carolingian communications. Data of varying and independent origins discloses some clear patterns. Development and growth are among them.

How people got from the western to the eastern areas of the former Roman empire changed dramatically between 700 and 900. The routes increased, from one main route to five or more, depending on how finely one distinguishes them. They also changed in nature, as what were mainly sea routes came to be flanked by

1 Peter of Pisa, *Carmina*, no. 12, 11, p. 62; cf. Paul Deacon's response, no. 13, 10, p. 67. Amalarius himself calls his poem "Versus marini": *Opera liturgica*, 1.231.19.

2 Four earlier studies merit mention: Pertusi 1964, esp. 82–92; Hubert 1964; the imaginative though poorly documented work of Lombard 1972, 73–94; and Micheau 1979. On the concept of routes, as opposed to roads (or, indeed, navigational courses), see Denecke 1979, 439–42.