8 Appendix
An Examination of Cyprus-Aegean Connections Based on Nautical Considerations

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Summary 8.1 Introduction. – 8.2 Background. – 8.2.1 Ancient Ship Construction and Sea Worthiness. – 8.2.2 Sea Conditions. – 8.2.3 Textual Evidence on Sailing Seasons. – 8.3 Discussion. – 8.3.1 The Sailing Season. – 8.3.2 The Routes from Crete to Cyprus. – 8.3.3 The Route from Cyprus to Crete. – 8.3.4 Sailing Towards the Mainland: The Argolid and the Peloponnese. – 8.4 Conclusions.

8.1 Introduction

This book has provided detailed evidence for the increased interaction between Cyprus and the Aegean in the third millennium BC. To travel from Cyprus to Crete, ancient mariners would have had to sail a sea route of no more than 430 NM depending on the starting location and the final destination. For longer trade voyages, such as between the Aegean and the Levant, Cyprus would have served as a natural steppingstone. This chapter aims to examine the possible sea routes that would have contributed to the establishment of these connections. It addresses not only the feasibility of sea travel, but also the complexities associated with different routes. Inspired by Knapp, Russel and Van Dommelen, who appropriately point out that

> a true maritime perspective requires more than simply asserting the dominance of Sardinian, Cypriot or Aegean traders on the basis of some exchanged commodities (2021, 80)

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this chapter employs a nautical approach that relies on the current understanding of ancient navigation.[1] It begins with a brief background that includes some information on the construction and seaworthiness of ancient ships, the climatic and sea conditions of the Aegean region, and the historic textual evidence regarding sailing seasons. Possible sailing routes from Crete to Cyprus and from Cyprus to Crete are then explored in detail. A cursory discussion on the sailing considerations for travel to the Argolid and the Peloponnese is presented before the section is concluded with some brief statements.

8.2 Background

8.2.1 Ancient Ship Construction and Sea Worthiness

Examining ancient navigation requires deconstructing the combination of factors that would have influenced the activity in the past. The construction of ancient ships and their seaworthiness is of particular importance. Unfortunately, it is not possible to comprehensively discuss this component here. However, previous research has proposed that both Aegean and Cypriot ships were light displacement ships, built in shell-first technique with only one mast positioned roughly in the middle of the hull on which a boom footed, square sail was mounted (Querci 2023, 56-120). Moreover, they probably were not equipped with a true keel; the Uluburun wreck – the only Late Bronze Age wreck that yielded significant hull remains – was equipped with a sort of protokeel protruding more inward than outward from the hull (Pulak 1997, 217). Such a keel would not be useful to prevent leeway, which is the angular deviation from the scheduled route. Boats like these seem to have been suitable mostly for running and reaching sailing with a beam reaching as a superior limit, i.e. with an angle with the wind between 180° and 90°.

8.2.2 Sea Conditions

Weather, wind patterns, and currents all contribute to the sailing conditions faced by ancient mariners in the Aegean and the Eastern Mediterranean. Reconstructing Bronze Age wind patterns is a critical issue for research dealing with ancient seafaring, but unfortunately there has been a lack of study concerning this issue.

1 Concerning the importance of geography, climate, and ships' seaworthiness in defining connectivity during the Bronze Age, also cf. Papageorgiou 2009, 199-222; Safadi, Sturt 2019, 1-15; Tartaron 2018, 61-92.

Figure 1 Average annual trend of the winds in the area of interest for this study

In this paper, this *vexata quaestio* will not be addressed in detail, and instead the safe working assumption that Bronze Age Mediterranean wind and sea conditions were comparable to contemporary conditions is adopted (cf. Querci 2021a; 2023, 133-6 with previous bibliography).

The sea-basin of interest for the present contribution includes two sub-basins: the Aegean Sea and the Eastern Mediterranean. The Aegean Sea is delimited by the Peloponnesian coast to the West, the Macedonian coast to the North, the Turkish coast to the East and the Northern coast of Crete to the South. The Eastern Mediterranean basin is located to the south of the Aegean Sea and is roughly comprised of the area between the southern coast of Crete, the North African coast and the Levantine coast of Turkey.

The temperate Mediterranean climate occurs across this entire region and is characterized by its two dominant seasons: winter and summer. Winters are generally cool and rainy, while summers are dry and warm. Wind intensity and direction also vary by season. While the prevailing winds are from the north throughout the year, in winter, there is variability and “an almost equal proportion of northerly and southerly winds can be expected” (Heikell, Heikell 2018, 29), with a greater frequency of gales (Ritossa 2011, 71). Aegean gales can easily produce very rough seas with “choppy, short frequency”, and high waves (Tartaron 2013, 101). Cloud cover is also greatest in winter months. During summer, on the other hand, the weather is stable, and winds mainly blow from the north. Both Greek and Anatolian coasts, due to their hillocky morphology, can be affected by katabatic winds, which, according to Heikell and Heikell, can blow "off steep mountain slopes" especially at night with a strength up to 5-6 Beaufort (Bft) (2018, 29).

While the climatic characteristics are shared by the Aegean Sea and the Eastern Mediterranean, unique wind conditions occur in each area. In the Aegean Sea, summer is also the season of the Meltemi, a northern wind **[fig. 1]** which ancient Greeks called ἐτήσιος, due to its annual seasonal character. It is created by a

> low-pressure system that extends from Turkey to northwest India and of a high-pressure center in the central and south Europe. (Poupkou et al. 2011, 459)

It usually starts to blow in June, reaching its full strength in August and dies at the end of September/early October. It often reaches 5-7 Bft, and it is also not uncommon to blow at 8 Bft. Meltemi can blow with a strength that reaches Egypt (Morton 2001, 48) and sometimes it causes true gales in sunny weather that can interrupt ferry travel (Poupkou et al. 2011). Its strength usually varies during the day, reaching its maximum in the afternoon (Anagnostopoulou et al. 2014, 1820). While occasionally of formidable force, for mariners the predictability of the Meltemi winds can be considered a reliable feature of the summer navigation season. Poupkou et al. (2011) indicate that during the same season it is possible to have up to 45 Meltemi days, and Anagnostopoulou et al. (2014, 1834) argue for the possibility that 80% of summer days can be characterized by this wind. Hesiod (Ἔργα καὶ Ἡμέραι, 663-5) had stated that the true sailing season only lasts 50 days after summer solstice, and it is very tempting to correlate this statement to the mean number of Meltemi days in the summer season (Janni 1996, 111).

In the Eastern Mediterranean basin, like in the Aegean Sea, the winds mostly blow from north to northwest, with greater variability during winter. Winter bad weather, however, usually does not last for a long time. Summer here is also a season of stable weather. In this period, wind usually blows from north to west/northwest and from the west along the Levantine coast. However, the Meltemi winds, which are generally confined to the Aegean Sea, when strong can possibly spread southeastward and penetrate into the Eastern Mediterranean basin (Ritossa 2011, 80).

Near Cyprus, which is in the Eastern Mediterranean basin, the summer wind tends to blow from the west following the shape of the coastline. It typically picks up at noon, reaching no more than 3-6 Bft. Offshore, it also follows the profile of the coast and tends to blow from west to west/southwest (Heikell 2007, 325). Useful information can also be inferred from wind roses (Ritossa 2011, 114), which present the average wind speed and direction over specified time periods. During summer, along the southern coast of Turkey, it is common to experience western winds which blow with an average strength of 4 Bft. In front of the African coast, the wind tends to blow from the northwest with a mean strength of 3 Bft. While along the Levantine coast, it usually blows from the west at the same average strength of 3 Bft. The odds of experiencing calm weather conditions are low almost everywhere except along the Levantine coast during the month of June, when there is a 13% possibility of windless conditions. However, the information provided by wind roses is not necessarily accurate; the rose only gives mean values but says nothing about the daily variability of wind strength. Additionally, both in the Aegean and in the Eastern Mediterranean, land and sea breezes can play a major role in shaping wind patterns. Land and sea breezes are thermic winds generated by the different heating rate between land and sea (Gallino 2015, 160-200). They blow perpendicular to the coastline, with sea breezes blowing during the day from the sea toward land and land breezes blowing at night from the land toward the sea. Sometimes these winds blow with such strength that they overwhelm the prevalent winds that conform to the coastline.

Sea currents, which can impact cruising speed, are another factor that can affect sailing. Occasionally, the strength of sea currents can even prevent sailing, such as in the Dardanelles, where the current can sometimes flow up to 7 knots making a Black Sea connection impossible even for modern sailing boats. Both in the Aegean and in the Eastern Mediterranean the currents flow in a counterclockwise direction, and therefore flow northward along the Levant, westward along the southern coast of Turkey, northward along the Aegean coast of Turkey, and southward along the eastern Peloponnese and through the Cyclades. Near Cyprus, the current tends to follow the profile of the coast, flowing eastward along the southern coast and westward along the northern coast (Mediterranean Pilot, 181).

8.2.3 Textual Evidence on Sailing Seasons

Long distance sailing and, particularly, open-sea sailing relies on the possibility of taking advantage of predictable and reliable winds, i.e. winds that blow with such a continuity to allow planning the voyage (Arnaud 2005, 17; Broodbank 2000a, 94) and it is probable that sailing activity was greater during times when conditions were optimal. This does not necessarily rule out the possibility of sailing throughout the whole year, and it is unrealistic to imagine the Mediterranean as completely devoid of ships for a part of the year. However, winter would likely have been a less suitable season for long distance sailing. In fact, Hesiod (*Op.*, 641-2) recommends to his brother: Τύνη δ', ὦ Πέρση, ἔργων μεμνημένος εἶναι ὡραίων πάντων, περὶ ναυτιλίης δὲ μάλιστα, which translates as 'Perseus, everything has to be done in the proper season, and above all sailing'. Although Hesiod wrote his poem during the seventh century BC, it provides early textual evidence on the importance and consideration given to sailing season. Analyzing his words in more detail, the poet defines the sailing time frame in the following way (*Op.*, 663-5):

> Ἤματα πεντήκοντα μετὰ τροπὰς ἠελίοιο,
> ἐς τέλος ἐλθόντος θέρος, καματώδεος ὥρης,
> ὡραῖος πέλεται θνητοῖς πλόος
>
> Fifty days after the solstice,
> Towards the end of the laborious summer,
> That is the proper sailing time for mortals

As mentioned above, he argues for a fifty day-long sailing season beginning after the summer solstice. The exact period to which the poet refers is unclear and scholars have proposed many hypotheses (e.g. Medas 2004, 36); however, this time frame seems to match with the mean number of Meltemi days and it seems possible that the poet is referring to this weather phenomenon. However, it is equally likely that he was simply stipulating that it is possible to safely sail only for fifty days during summer, without giving any specific calendar information (Medas 2004, 36).

Additional information can be traced in other historical sources. Vegetius, who wrote his *Epitoma Rei Militaris* in the fourth century BC, calls (4.39) for a sailing season which runs from May 27th to September 14th, but he also states that, accepting more dangerous periods, it is also possible to sail from March 10th to May 26th and from September 15th to November 10th. During the other months he considers the sea as clausum. Moreover, the *Codex Theodosianus* preserves an edict enacted by emperor Gratianus on 6 February 380 AD which prevented the ships of the *corpus navicolariorum africanorum* from setting their sail before April 13th and after October 15th. Demosthenes (*Lacr.* 10) and Lucian (*Tox.* 4) confirm that sailing after the autumnal equinox was considered dangerous. The same can be inferred from the Acts of the Apostles (27:9) in which Saint Paul's sailing is considered dangerous because it was taking place at the end of October.

The written sources from the eighth century BC to the fourth century AD all seem to suggest a similar time frame for safe sailing. But what about the Late Bronze Age? Even if written evidence for this chronological horizon is meager, some useful information is available in the Linear B tablets and in Egyptian epigraphs and reports. The Linear B tablet PY Tn 316 (Varias 2016, 559; Palaima 1999) contains entries about offerings to several deities. It seems that these offerings took place in the month of *po-ro-wi-to*, usually read as Plowistos, i.e. the month of sailing, a month usually thought to be in the beginning of spring.[2]

From Egypt, information on sailing can be found in an epigraph from Mit Rahina and in the so-called Report of Wenamun. The epigraph gives an account of several commercial and military expeditions dating to the reign of Amenemhet II (Twelfth Dinasty). This document seems to provide information about the limits of the sailing season. Due to the ambiguous nature of the document, however, different readings have been put forward by various scholars. Altenmüller and Moussa (1991, 26-8) argue for the possibility of a winter sailing, while Marcus (2007, 146) is more convinced by a spring departure and an autumn homecoming.

Interpreting the Report of Wenamun seems even more difficult. The document apparently gives the account of the voyage of a priest, Wenamun, from Karnak to Byblos. It is unclear if it should be regarded as the account of a real voyage or if it should instead be considered as a fictional story (Sass 2002; Schipper 2005). Interpreting the timing of Wenamun's voyage is also not simple. Egberts (1991) argues for the possibility of a departure in January in order to place the priest's arrival at Byblos in May. Goedicke (1975) preferred a departure from Egypt in May, hence placing the sailing within the traditional limits of the ancient sailing season.

8.3 Discussion

8.3.1 The Sailing Season

Considering the above evidence on wind direction and currents, we now turn to what we can infer about Late Bronze Age sailing seasons and routes (for a comprehensive study of ancient sailing season, cf. Beresford 2013). In terms of sailing season, Raban (1991, 30) argues for the possibility of sailings from mid-April to mid-June and from mid-September to mid-October, which would allow ancient mariners to avoid both the unpredictability of winter weather and the strong and regular Meltemi that he considered unsuitable for vessels utilizing a square sail. Broodbank, in his discussion on Early Bronze Age navigation, takes a broader perspective on the factors impacting navigation and asserts that

2 Palmer 1955, 10-12; 1963, 248-65; Bennet, Olivier 1973, 233; Chadwick 1976, 90, 179, 192; Wachsmann 1998, 370, fn. 1; *contra* cf. Palaima 1995, 629; 1999, 443-4; Weilhartner 2002.

> the windows for voyaging without conflict with agricultural demands are the marginal month of April (olive excepting), August, and September (vines excepting). (2000, 95)

However, while it is true that, especially in the Aegean, the Meltemi can occasionally reach gale force, their regularity and predictability might also have benefited mariners, allowing them to plan their route. It seems reasonable therefore to consider a sailing season that would run at least from the beginning of May to the end of September in the Aegean and from the beginning of April to the end of October in the Eastern Mediterranean.

8.3.2 The Routes from Crete to Cyprus

8.3.2.1 The Northern Route

From the Minoan Prepalatial to Neopalatial periods a route seems to have connected, at least sporadically, the northern coast of Crete to the northern coast of Cyprus **[fig. 2]**. In this stretch of the Mediterranean, the prevalent west to northwest winds (Mediterranean Atlas 2004; Ritossa 2011, 112-14) and the southeast current (Mediterranean Pilot 2005, fig. 1.139.2) surely facilitate an eastbound route. However, as mentioned above, Bronze Age boats likely lacked a modern keel, and therefore they could hardly have directly sailed from Eastern Crete to Northern Cyprus. An indirect connection via Kasos and Karpathos seems more plausible since it could have helped to offset the effect of the leeway. Ormos Khelatronas on Kasos and Ormos Pighadia on Karpathos, for example, might have been good ports to safely overnight in the first two stages of the voyage. The last stage, from Ormos Pighadia to Morphou Bay, forces the mariner into the open-sea. This 275-NM-long sailing can be covered in three to four days assuming a cruising speed between 3 and 4 knots. July seems to be the most suitable month for this last stage of the voyage because it is characterized by the highest frequency of western winds (71%; Ritossa 2011, 112-14). Yet, it may have been difficult to reach Karpathos from Crete in July, and the first part of the journey may have required setting sail between May and mid-June, before the Meltemi start to blow regularly. While the earlier departure would have been less suitable to the second stage of the voyage (i.e. Karpathos to Cyprus), the frequency of western winds in these months is still remarkable, especially in June when they reach 45%, and an earlier crossing from Karpathos to Cyprus was likely plausible. It is also possible that the whole voyage was accomplished in stages with a long layover (i.e. 2-3 weeks) spent on Karpathos.

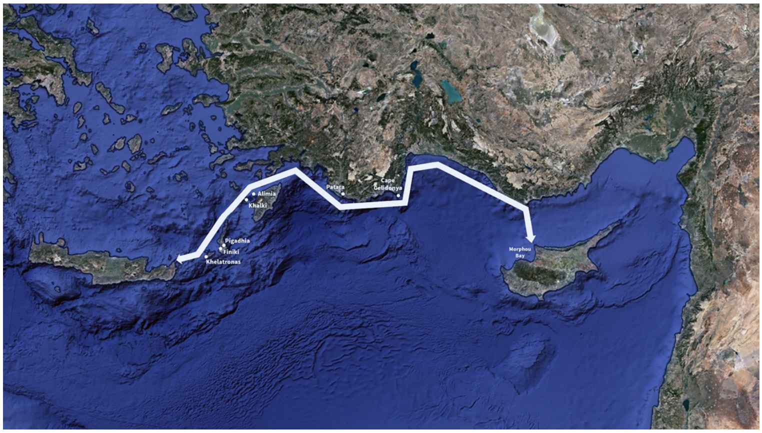

Figure 2 The Northern Route (probable route connecting Crete to Cyprus during Pre-Palatial to Neopalatial time frame)

There is, however, another possible Northern Route from Crete to Cyprus, i.e. tramping[3] through Kasos, Karpathos and Rhodes and along the southern coast of Turkey. The most difficult segment of this route is reaching Rhodes. The strong winds that often blow along Kasos and Karpathos can make the sea "angry" (Heikell 2018, 524) and the current, which flows to the southeast, can be an obstacle to boats bound for the northeast. Further complicating the journey is the fact that Rhodes is not rich in suitable harbors (Blue 1995, 363). On the east coast, which is better protected from the wind, the only good shelter seems to be Lindos; on the western coast, instead, the mariner could have taken advantage of the islets of Khalki and Alimia as good places to rest at night. Blue (364) considers the possibilities of sailing along the western sides of Kasos, Karpathos and Rhodes, suggesting Finiki on Karpathos as a good harbor to spend a night. On Kasos the only well-sheltered cove seems instead to have been the aforementioned Ormos Khelatronas.

Considering the distances in greater detail, Ormos Khelatronas is 15 NM from Finiki which is, in turn, 60 NM from Khalki. Khalki is 33 NM from the northwestern edge of Rhodes. Speaking from frequent direct experience, it is possible to sail these last 33 NM

3 Taking into account that there were several constraints imposed by the limited seaworthiness of the available ships when compared with the nautical conditions characterizing the area under consideration, the word 'tramping' is used here instead of cabotage. Following Knapp and Demesticha, the term 'cabotage' suggests a sailing through a well-defined succession of ports (about sea trade mechanisms, cf. Knapp, Demesticha 2017, 151-60), while tramping defines a simple coastal sailing where port stops may vary.

when Meltemi does not blow by taking advantage of a southern to southwestern sea breeze. The 60 NM between Karpathos and Khalki therefore would likely have been the most difficult to sail. Placing this sailing during the peak of Meltemi sounds unlikely and the time frame from May to mid-June would likely have been a more suitable choice.

Once the northwestern edge of Rhodes was reached, it is possible to imagine a sailing similar to that of Saint Paul that was described above. In the Acts of the Apostles (21:1-3), Saint Paul is said to have reached Tyre from Rhodes through Pàtara on the Turkish coast, moving directly from there to Syria with Cyprus on his portside. Pàtara is only 50 NM from northeastern Rhodes and approximately 177 NM from Morphou Bay. The winds are usually fair for both sailings. It is also possible to imagine a route to Cape Gelidonya tramping from Pàtara along the southern coast of Turkey in order to get to Morphou Bay from the cape. This route would have made it possible to reduce the open-sea sailing from 177 NM to approximately 125 NM, the distance that separates Cape Gelidonya from Morphou Bay.

May to mid-June can still be considered the most suitable time frame for this sailing since it was possible to take advantage of land and sea breezes. When Meltemi conditions are negligible, the sea breezes start to blow at noon with a mean force of 3-4 Bft; the land breeze, instead, usually blows no more than 2-4 Bft (Heikell 2007, 241). The mariner could have taken advantage of the land breeze to leave the harbor early in the morning and sailed until noon without having the coast on his leeside. This is desirable, since sailing with the coast on the leeside can be very dangerous as the vessel can be pushed against the coast by the wind and the sea. Taking advantage of the sea breeze also provides the possibility of reaching a new harbor in the afternoon. Sailing 20 NM per day would have allowed ancient mariners to cover the whole Pàtara-Cape Gelidonya distance in about four days. In total, therefore, at least six days would have been needed to reach Morphou Bay from Rhodes. This estimate however is based on optimal conditions and since nautical timing is heavily dependent on wind and sea conditions, the journey could surely have been much longer.

8.3.2.2 The Southern Route

A different route may have connected the southern coast of Crete to the southeastern coast of Cyprus in the LH/LM IIIA-B periods **[fig. 3]**. Kommos is the Cretan site that contains the most evidence for contacts with Cyprus; however, due to the prevalent winds and currents, coupled with the tendency of Bronze Age boats to lee, it seems more plausible that it may have been necessary for boats to lie at anchor

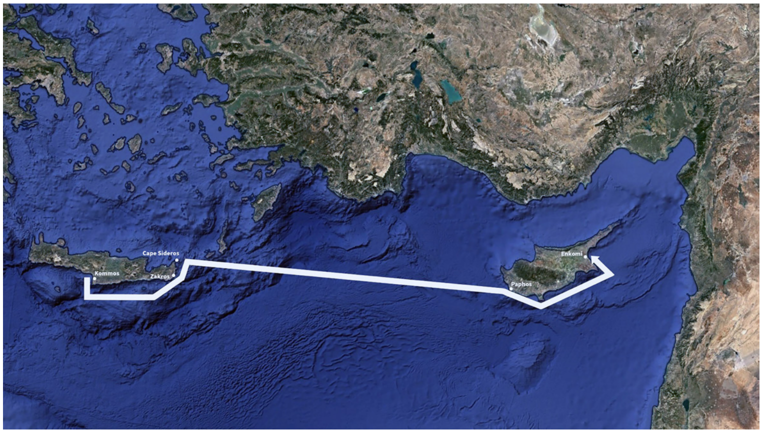

Figure 3 The Southern Route (probable route connecting Crete to Cyprus during LH/LM IIIA-B periods)

in the area of Cape Sideros. This area is the Samonium which Strabo (2.5.24) considers the starting point of the Egypt-bound route from Crete in his time. Mantzourani and Theodorou (1991, 50-1 and fig. 9) stress that in order to take advantage of currents one would have to travel counterclockwise to reach Cape Sideros from southern Crete. However, this statement does not agree with information given by the Mediterranean Pilot (2005, 129 and fig. 1.139.2) which states that the currents are "very weak and variable in direction". Moreover, along the southern coast of Crete the katabatic winds blow strongly from the coast and can make sailing difficult in any direction (Heikell, Heikell 2018, 536). Hence, an eastward navigation to Cape Sideros through Zakros can be suggested. May to mid-June, when the Meltemi are not blowing or are weak, could have been the best time frame for this voyage.

Cape Sideros is more or less 340 NM from Paphos which, at least for geographic reasons, could have been a good initial stop on Cyprus. Following Ritossa (2011, 112), April, July, August, and September seem to have been the most suitable months to sail from Cape Sideros to Cyprus due to the lack of winds from the south. May and June, instead, seem to be characterized by southwestern winds of some frequency blowing at 3 to 4 Bft, making the voyage more dangerous. However, according to the *Wind and Wave Atlas of Mediterranean Sea* (Mediterranean Atlas 2004), these winds are only considered significant during these months and not throughout the year.[4]

4 The Atlas takes into consideration winds blowing at a speed of at least 6 m/s (4 Bft or more) and characterized by a frequency of at least 10%.

From Paphos, sailing becomes easier due to the fact that the winds tend to blow from the west and parallel to the coastline. Gertwagen (1995) stresses that this route also was the best option for reaching the Holy Land in the first half of the second millennium AD and it is the route documented by Parma Magliabecchi Portolano. From Paphos, it should have been possible to reach Enkomi through a series of 20 to 30-NM-long stages; however, reconstructing the route along this stretch of coast is not an easy task because the Bronze Age coastline was probably different than today (Stanley Price 1980, 8, for Akrotiri; Karyda 2016, 86, for Maroni; Blue 1997, 32-5 for the Salt Lake of Hala Sultan Tekke) and it is possible that the materials could have been distributed through tramping more than through an organized cabotage. In any case, the ca 120 NM separating Paphos from Enkomi probably required at least 6 days of travel along the coast. Both the winds and the currents contribute to making this sailing, if not easy, at least feasible.

8.3.3 The Route from Cyprus to Crete

8.3.3.1 The Northern Route

Traveling from Cyprus to Crete is in general a more difficult journey than traveling from Crete to Cyprus. However, as far as the Northern Route is concerned, it seems plausible that the way back to the Aegean could have been more or less the same as the Cyprus-bound voyage **[fig. 2]**; hence, ancient mariners would first hit the Anatolian coast in the area of Cape Gelidonya. Mantzourani and Theodorou when assessing the northern options, suggest that

> the trip from Cyprus to Crete would have required a somewhat risky crossing from Cyprus to Anatolia due to local wind conditions, […] but once in Anatolia coast, then, taking advantage of the counterclockwise longshore flow, Crete could relatively easily be reached. (1991, 50)

Even if sailing along the southern Anatolian coast could hardly be defined as easy, this seems the only feasible possibility for Cypriot ships to reach the Aegean and for Aegean ships to make a return voyage.

After passing Cape Gelidonya, the ancient mariners who wanted to reach Rhodes – and from Rhodes, Crete – were forced to sail slightly north to Fethiye Bay. During summer, this stretch of coast is swept by Meltemi. Hence, this sailing is more likely to have occurred in the late Spring or early Autumn to avoid the peak of Meltemi and to take advantage of land and sea breezes. The danger of this sailing is testified by the famous Uluburun wreck which sank in front of this cape, ca 10 km from the city of Kaș, around 1300 BC. The late Spring or early Autumn time frames would certainly help mitigate risks, with late Spring in particular possibly being a better option due to the long daylight hours. However, early Autumn cannot be ruled out as the best time for a return westward voyage for ships that had reached Cyprus in the Spring.

8.3.3.2 The Southern Route

In terms of difficulty and due to the wind patterns, a direct Southern Route, following the same path taken from Crete, seems as though it would have been incompatible with the seaworthiness of Late Bronze Age ships **[fig. 3]**. The primary difficulty for ancient mariners traveling from the south of Cyprus back to Crete would be the first segments of the voyage. To get to Crete from the south would likely have required either: 1) sailing to the north of the island, where the Northern Route departs from the area around Morphou Bay, or 2) sailing northeastward to the coast of Anatolia from Cyprus, where it may have been possible to tramp along the coast in a counterclockwise direction, eventually converging with the Northern Route at Cape Gelidonya.

Mantzourani and Theodorou (1992, 51 and fig. 9; also cf. Blue 1995, 362) define a route based on the first possibility, proposing that mariners could round Cape Apostolos Andreas and then sail to Cape Kormakiti before heading north to reach the Anatolian coast. Even if it is accepted that the Northern Route, which relies on reaching Cape Gelidonya in Anatolia from Morphou Bay, was a feasible possibility, sailing from Enkomi to Morphou Bay tramping along the coast of Cyprus would have been risky. Apart from the difficulty of rounding Cape Apostolos Andreas (Heikell 2007, 331; Mediterranean Pilot 2005, 199), sailing along the coast in the teeth of the prevalent western winds does not seem compatible with the seaworthiness of Late Bronze Age ships. Georgiou (1997, 121) pointed out that the northern coast of Cyprus "is not safe due to the prevailing wind direction and geomorphology". Such a difficulty seems to be implied also by the Acts of the Apostoles (13:6-12): Saint Paul, once he reached Salamis, is said to have gotten to Paphos across the island, implying overland travel as opposed to sailing. The use of the overland route may have been a consequence of the difficult westward sailing due to the western winds that prevail also along the southern coast.

The second southern route option, traveling northeastward from Cape Apostolos Andreas to reach the Anatolian coast – maybe the area of Mersin? – may have been a more viable option **[fig. 4]**. Once the Anatolian coast was reached, ancient mariners could have sailed

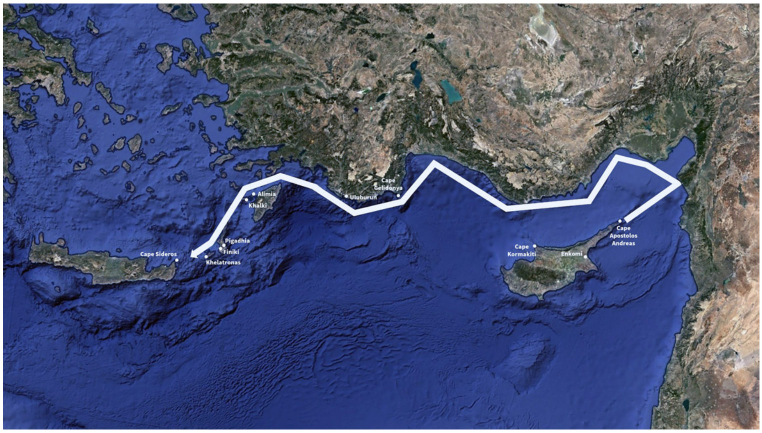

Figure 4 Probable route connecting Cyprus to Crete through the whole period of interest for this study

westward taking advantage of the westward flowing current and of the land breezes that in this area usually blow from early morning to noon (Heikell 2007, 297). It is tempting to divide the voyage in 20-NM-long stages; however, the 60-NM-long coastline between Mersin and Taşucu Körfezi, the first good shelter sailing westward, is sandy and straight. This stretch of coastline seems more suitable to receive modern tourists than ancient ships. However, while rather unlikely, there is the possibility of a daily haulage of the boats at the end of sailing (for this maneuver, which implies the hauling of the boat on the beach, cf. Blue 1995, 148-9; Chryssoulaki 2005; Georgiou 2012, 525-6). It is also reasonable to hypothesize a direct, 60-NM-long sailing from Mersin to Taşucu Körfezi. Assuming a cruising speed of 2 to 3 knots, it would have been possible to cover this distance in no more than 30 hours. From here, the coastline all the way to Cape Gelidonya is rich in indentations which could have allowed the ancient mariners to divide their voyage in daily stages, and it is possible that the ship which wrecked in front of Cape Gelidonya around 1200 BC was sailing along this very route bound for the Aegean (Wachsmann 1998, 208; for this ship and its cargo, cf. Bass 1967).

Looking at the entire voyage, from the southern site of Enkomi to reach Rhodes is more or less 450 NM, a fact that would have made it 20 days long. Hence it seems likely to imagine a departure no later than early May in order to reach Crete before the Meltemi starts to blow.

8.3.4 Sailing Towards the Mainland: The Argolid and the Peloponnese

From earlier discussions in this book, during the LH IIIA-B periods, the Argolid seems to have had the most intense contacts with Cyprus. Even if the possibility of a direct sailing from Cyprus to the Argolid seems feasible, it is also probable that Cypriot-Aegean trade took advantage of local networks. In this regard, Knapp, Russel and Van Dommelen (2021, 85) appropriately underline the necessity "to recognise the multi-scalar nature of Bronze Age maritime exchange networks". Moreover, it is very likely that both local Aegean mariners and Cypriot or Levantine mariners sailed more or less the same routes in order to get to the Argolid from Crete, and these routes themselves were not solely defined by commercial interests, but also – maybe mostly? – subject to sea conditions (winds, weather, currents) and the seaworthiness of the available boats. Because of these practical constraints, defining the route is an easier task than identifying the mariner. The wind pattern characterizing the Aegean makes every southbound route, if not easy, at least feasible. On the contrary, reaching the north is problematic. One can imagine a route connecting Crete to the Argolic Gulf tramping through Antykiyhera and Kythera, with the Gulf functioning as a sort of bridge between Crete and the Peloponnese (Heikell, Heikell 2018, 157-62) and connecting the eastern coastline of the Peloponnese (Querci 2021b). Cape Malea surely is the major danger along this route (Heikell, Heikell 2018, 156-7) and the hazards of this cape are attested by ancient written sources (*Od.* 3.286-90; 4.514-18; 9.80-1; *Str.* 8.6.20). Meltemi are weaker here than in other Aegean areas and the mariners could have taken advantage of land and sea breezes; this is even more true outside of the limits of the Meltemi season. Instead, the so-called Western String route (Davis 1979) seems to have only been a viable, southbound sailing route, facilitating travel to Crete from mainland Greece. As a southbound route, the Western String could have been sailed at any time within the limits of the sailing season.

8.4 Conclusions

This appendix aimed to provide a reconstruction of the possible options available to ancient mariners based on the conditions in which they lived. The environmental constraints and their impact on the choices of ancient mariners are but one component of the complex study of human interactions. Communities would have been involved along these routes as part of the network of contacts testified by the archaeological record. While these communities can be thought of as plots on the map, here we also consider them as part of an *orbital* *route* that cannot be clearly defined because of its complexity. The orbital route is not a succession of ports, where each port is visited every time, but rather a sort of wave function, where the probability of a ship entering a harbor or sailing along a coast ebbs and flows based on the sea and weather conditions in the area. Every route described in the previous pages is a route in such a sense, a route which is made of a cloud of possible sub-routes sharing the same general direction but impacted by numerous variables of social and environmental origin. In other words, what is proposed here is not an isolated, single, commercial route in the modern sense of the term, but instead encompasses the concept of 'tramping', which was used throughout this text (see above appendix fn. 1). To conclude, this paper does not aim to define with certainty the route network connecting Cyprus to the Aegean – following the above discussion, how could one do it? – but only to present some hopefully useful thoughts to better define the complexity of the problem.

Finally, as noted by Knapp, Russel and Van Dommelen (2021, 93), it is true that "connectivity is not simply a by-product of economic expediency, labour requirements or risk management" and that "Mediterranean interaction webs are social networks, and reflect human relationships", yet it is also important to emphasize that connectivity is the result of the interaction between human beings and the environment. Every human action is defined – and in some way limited – by both social and environmental constraints. Hopefully the reconstructions presented here can contribute both to our understanding of these factors and to the ongoing and important research on human mobility and network theory. A thought by the philosopher E.C. Banks seems applicable:

> However mysterious the mind-body problem may be for us, we should always remember that it is a solved problem for nature. (2014, 168)