AN ANALYSIS OF THE 'CLOSED HARBOURS' IN STRABO'S *GEOGRAPHY*: BACKGROUND, NATURE AND MEANING OF THE EXPRESSION

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The expression λιμὴν κλειστός appears 29 times in ancient Greek literary sources; however, it has prompted four different interpretations and three possible English translations. As a contribution to the ongoing discussion of the expression's meaning, this paper analyses its appearances in Strabo's Geography; *this work, with its nine references, is, in fact, the source in which it appears second most often. In particular, focus will be placed upon two issues: the extent to which the expression is employed consistently in the* Geography *and its possible origin; and what meaning(s) – if any – can be assigned to it. To gain further insight into the expression's meaning(s), the aforementioned cases of 'closed harbours' will be compared with the available archaeological and geomorphological evidence.*

INTRODUCTION

The expression λιμὴν κλειστός (literally, 'closed harbour') is not as frequent in the Greek sources as the scholarship it has engendered might suggest: its 29 mentions (Table 1) have, in fact, prompted no less than four different interpretations and at least three English translations.[1] Currently λιμὴν κλειστός can be expected to have one of the following meanings: a harbour inside the walls of a city, whose traffic was under the city's surveillance (Lehmann-Hartleben 1923, 65–74; Casson 1971, 362–3; Vélissaropoulos 1980, 33; Murray 2012, 78), a naval base (Rougé 1966, 116–17) or a harbour whose entrance could be blocked by chains or booms (Von Gerkan 1924, 113–14; Blackman 1982, 194; 2008, 654–5). Accordingly, it has been rendered in modern languages as an 'enclosed', 'closed' or 'closable' harbour (Mauro and Gambash 2020, 59–61). For the sake of convenience, in this contribution 'closed harbour' will be adopted as the corresponding English translation.

When considering references to the expression as a whole, three phenomena can be observed. First, its use covers a wide chronological period, the earliest references dating to the fifth century BC and the final ones being attributable to Late Antiquity.[2] Second, 25 out of the 29 references are to be found in just three works: the *Periplus of Ps.-Skylax*, Strabo's *Geography* and Dionysus's *Description of Greece*.[3] These three works were strongly influenced by earlier *periploi*, viz. accounts of voyages initially

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[1]   We refer exclusively to the cases in which the expression λιμὴν κλειστός appears in that form. Additionally, there is also a series of texts containing similar phrases, namely, passages in which similar constructions formed with the verb κλείω can be found: for instance, Thucydides 2.94.4.

[2]   Chronologically speaking, the earliest extant references to the expression are probably those in Thucydides 2.94.4 and 7.38.2, for which reason they can be dated to the 5th century BC. For Thucydides 2.94.4, see the previous note. On the other hand, Thucydides 7.38.2 does not refer to a static reality (i.e., to the presence of a λιμὴν κλειστός), but states that Nicias asked for the Athenian ships to be repaired and placed in front of the palisade, thus recreating a sort of "λιμὴν κλειστός". Additionally, this expression also appears in the *Periplus of Ps.-Skylax*, a document that – despite being dated to the third quarter of the 4th century BC – probably drew on previous sources, attributable to the Archaic and Classical periods. The use of the term persisted until Late Antiquity: see, for example, Hesychius, s.v. Ζέα.

[3]   Only those mentions in which the expression λιμὴν κλειστός refers to the presence of a harbour definable as 'closed' have been taken into account here, thus excluding cases similar to Thucydides 7.38.2.

Table 1. References to the expression λιμὴν κλειστός in Greek literary sources.

Source	No. of occurences	References
Ps.-Skylax	14	- § 29 (Kerkyra)
		- § 33.1 (harbour near Ambrakia)
		- § 47.3 (Phalasarna)
		- § 47.3 (Kydonia)
		- § 58.1 (Paros)
		- § 67.1 (Thasos)
		- § 88 (Chalybes)
		- § 98.3 (Samos)
		- § 98.4 (Priene)
		- § 99.1 (Halikarnassos)
		- § 99.1 (Kos)
		- § 99.2 (Kaunos)
		- § 103 (Salamis of Cyprus)
		- § 104.2 (Sidon)
Strabo	9	- 12.8.11 (Cyzicus)
		- 13.2.2 (Mytilene)
		- 14.1.37 (Smyrna)
		- 14.2.3 (Kaunos)
		- 14.2.15 (Knidos)
		- 14.6.3 (Kition)
		- 16.2.23 (Tyre)
		- 17.1.6 (Alexandria of Egypt)
		- 17.1.9 (Alexandria of Egypt)
Dionysus son of Kalliphon	2	- vv. 27–28 (harbour near Ambrakia)
		- vv. 118–122 (Phalasarna)
Philochoros of Athens or Menekles = Scholium in Aristophanes, *Pax* 145	1	- Philochoros *FGrHist* 328 F 203 Jacoby or Menekles *FHG* 4 = Scholium in Aristophanes, *Pax* 145 (the three basins of the Piraeus)
Dio Cassio	1	- 75.10.5 (Byzantium)
Scholium in Aelius Aristides	1	- *Scholia vetera*: scholium in *Orat.* 13.113 (definition)
Hesychius	1	- s.v. Ζέα (Zea)

derived from guides for seafarers, and may have adopted a series of technical nautical expressions. Third, since no original *periplus* is extant, the interpretation of such terminology remains, for the most part, still obscure.

Previous attempts at translating the expression λιμὴν κλειστός have provided a general definition, without considering the dynamism of language and the possibility that the expression might have changed over time and space (except for Raban 1995; Moreschini 1997; and Baika 2009) or even depending on the author or genre. To address these biases, the intention here is to perform a more specific analysis by focusing upon the use of the expression in the works of a particular author. As a study of its meaning in the *Periplus of Ps.-Skylax* (which is the text containing the earliest and most frequent references) has recently been conducted by Mauro and Gambash (2020), the intention here is to determine how this expression was used in Strabo's *Geography*, which contains nine references to λιμένες κλειστοί apparently related to 10 harbour basins (Table 2). Since that work drew both upon earlier sources (of the third to second centuries BC) and the author's first-hand experience, the information contained in Strabo's *Geography* could therefore offer an idea of what the expression λιμὴν κλειστός might have meant during this period.

The aim of this paper is threefold: first, since it is known that Strabo drew upon a variety of sources in the writing of his *Geography*, the aim is to assess whether or not the expression is used consistently in this work; second, an attempt will be made to gain further insights into its

Table 2. Names of the cities with a 'closed harbour', according to the *Geography* (in order of appearance), with an indication of the geographical area in which they were located.

Λιμὴν κλειστός	Reference	Text	Translation (Roller 2014)	Location
Cyzicus	Strabo 12.8.11	ἔχει δὲ ὁμώνυμον πόλιν πρὸς αὐταῖς ταῖς γεφύραις καὶ λιμένας δύο κλειστοὺς καὶ νεωσοίκους πλείους τῶν διακοσίων	There is a city of the same name near the bridges, two harbours that can be closed, and more than two hundred shipsheds.	Propontis
Mytilene	Strabo 13.2.2	ἔχει δ᾽ ἡ Μιτυλήνη λιμένας δύο, ὧν ὁ νότιος κλειστὸς τριηρικὸς ναυσὶ πεντήκοντα, ὁ δὲ βόρειος μέγας καὶ βαθύς, χώματι σκεπαζόμενος	Mytilene has two harbours, the southern of which can be closed and has space for fifty triremes; and the northern is large and deep, protected by a mole.	Aegean Sea
Smyrna	Strabo 14.1.37	τὸ δὲ πλέον ἐν πεδίῳ πρὸς τῷ λιμένι […] ἔστι δὲ πρὸς τῇ ἄλλῃ κατασκευῇ τῆς πόλεως καὶ λιμὴν κλειστός	… most of it (i.e., the city) is on the plain near the harbour […] In addition to the other fixture of the city, it has a closed harbour.	Aegean Sea
Kaunos	Strabo 14.2.3	ἔχει δ᾽ ἡ πόλις νεώρια καὶ λιμένα κλειστόν	The city [Kaunos] has dockyards and an enclosed harbour.	Caria
Knidos	Strabo 14.2.15	εἶτα Κνίδος δύο λιμένας ἔχουσα, ὧν τὸν ἕτερον κλειστὸν τριηρικὸν καὶ ναύσταθμον ναυσὶν εἴκοσι	Knidos has two harbours – one of which can be closed and is for triremes – and is a naval station for twenty ships.	Aegean Sea
Kition	Strabo 14.6.3	ἔχει δὲ λιμένα κλειστόν	(Kition) has a harbour that can be closed.	Cyprus
Tyre	Strabo 16.2.23	δύο δ᾽ ἔχει λιμένας τὸν μὲν κλειστὸν τὸν δ᾽ ἀνειμένον, ὃν Αἰγύπτιον καλοῦσιν	It has two harbours: one that can be closed and the other, called the Egyptian, is open.	Levant
Alexandria	Strabo 17.1.6, and 9	ποιεῖ δὲ καὶ τοῦτο ἄλλον λιμένα τὸν τοῦ Εὐνόστου καλούμενον· πρόκειται δ᾽ οὗτος τοῦ ὀρυκτοῦ καὶ κλειστοῦ λιμένος […] τούτοις δ᾽ ὑπόκειται ὅ τε ὀρυκτὸς λιμὴν καὶ κλειστός, ἴδιος τῶν βασιλέων, καὶ ἡ Ἀντίρροδος νησίον προκείμενον τοῦ ὀρυκτοῦ λιμένος, βασίλειον ἅμα καὶ λιμένιον ἔχον· ἐκάλεσαν δ᾽ οὕτως ὡς ἂν τῇ Ῥόδῳ ἐνάμιλλον.	It forms a second harbour, called *Eunostos*, which lies in front of the man-made enclosed harbour. […] Lying below them is an excavated harbour that is enclosed – a private one for the kings – and also Antirrhodos, an islet lying off the excavated harbour that has a palace and a small harbour.	Egypt

meaning(s) by examining the archaeological and geological evidence available for the harbours referred to as κλειστοί; finally, the use of the term in the *Geography* will be compared with similar expressions in other written sources.

ΛΙΜΗΝ ΚΛΕΙΣΤΟΣ: FREQUENCY OF THE TERM

In order to answer the first question – namely, to assess whether or not the expression λιμὴν κλειστός is employed consistently in Strabo's *Geography* – it is essential to consider the nature of this work. Indeed, although its originality is undeniable, the *Geography* draws on earlier heterogeneous sources to which the Greek geographer, historian and philosopher added

considerations deriving from his first-hand experience (Aujac 1966). The result is an impressive 17-volume work that conveys much of his contemporary knowledge, but in which variations relating to the original sources can be detected (Rouillard 1993, 46). The particular nature of this work makes it necessary to modify slightly the approach to the first question (i.e., to what extent λιμὴν κλειστός is consistently employed in the *Geography*), by initially enquiring into the background of the expression's frequency of appearance, or from what kind of source it might have stemmed.

When considering the passages including the expression λιμένες κλειστοί, three different approaches to harbour descriptions can be identified (see Table 2). The first approach can be observed in the cases of Mytilene, Kaunos, Knidos, Kition and Tyre. The descriptions of these harbours follow a comparable scheme and offer valuable maritime information, such as references to specific harbour services (e.g., one of the harbours of Knidos was used by triremes as a naval base: Strabo 14.2.15) and facilities (e.g., the northern harbour of Mytilene was protected by a breakwater: Strabo 13.2.2). Even though these descriptions are not analytical, but limited to schematically recording a series of data, they provide relevant maritime information. Their overall structure and the terminology that they employ call to mind the composition of earlier *periploi* or other specialised documents containing a description of coastlines (cf. *Periplus of Ps.-Skylax* [Mauro 2022] and the anonymous *Stadiasmus of the Great Sea* [Medas 2008]). Explicit evidence of Strabo's debt to nautical sources is repeatedly found in the *Geography*, since he himself openly admits to owing much of his coastal knowledge to previous accounts of sea voyages (e.g. Strabo 1.2.26, 8.1.1 and 8.3.20). The conceivably common origin of these passages may therefore indicate that they are referring to a consistent – or at least similar – situation when recording the existence of a λιμὴν κλειστός in a certain place. Furthermore, examining both Strabo's biography and work, it is tempting to suggest that these references to λιμένες κλειστοί might have even been borrowed directly from the same source, viz. Timosthenes' Περὶ λιμένων (*On Harbours*).

Timosthenes of Rhodes, the admiral and chief helmsman of the fleet of Ptolemy II (285–246 BC), was mainly stationed at Alexandria. He wrote a treatise entitled Περὶ λιμένων in 10 books which Strabo certainly consulted, probably during his stay at Alexandria (e.g. Strabo 2.1.40 and 9.3.10). This observation, combined with the fact that all the λιμένες κλειστοί mentioned in the *Geography* fall into the geographical area better known to Timosthenes,[4] reinforces the possibility that all the aforementioned descriptions (Mytilene, Kaunos, Knidos, Kition and Tyre) might have been borrowed from that treatise, thus meaning that they all date to the third century BC.[5]

The second approach involves the description of Alexandria. In this case, it is particularly detailed and occupies a considerable amount of space. The reason behind this wealth of information, as well as the special attention devoted to it, can be found in the author's own biography: Strabo actually spent a few years at Alexandria around 20 BC and was, therefore, familiar with its topography and infrastructures. Unlike the descriptions deriving from earlier *periploi*, for his account of Alexandria the geographer relied mainly on his own experience, for which reason it is attributable to the end of the first century BC (Dueck 2000, 42; Roller 2018, 946).

Lastly, a third approach is adopted in the passages referring to Cyzicus and Smyrna. For these cases, Strabo could also have technically drawn on Timosthenes' work; however, the descriptions of Cyzicus and Smyrna are quite different from the other cases in which λιμένες κλειστοί are mentioned. In a comprehensive study of Strabo, Dueck (2000, 15–30) had already noted that the geographer lavished attention on these two cities, suggesting that this might have been due to the fact that he had visited them.[6] Although the scant information available on his travels does

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[4]   Timosthenes' work consisted of a circumnavigation of the Mediterranean, departing from Egypt and following an anti-clockwise course until arriving in Libya (Prontera 2013); however, Strabo decries Timosthenes' ignorance of the northern regions of the oecumene: Iberia, Gaul, Germany, Britannia, Pontus, the Adriatic and the Italian peninsula (Strabo 2.1.41; Ottone 2002, 154).

[5]   Furthermore, Strabo also consulted Erathostenes, whose work also drew heavily on Timosthenes' treatise.

[6]   In a recent commentary to the *Geography*, Roller (2018, 733) agrees on the possibility that the account of Cyzicus may be autoptic; as for Smyrna, Roller (2018, 803) simply points out that the city's description is unusually detailed.

not allow us to confirm this point,[7] we can rule out the possibility that the descriptions of these harbours were based on earlier nautical information. The details of the harbours of Cyzicus and Smyrna are, in fact, inaccurate or, at least, they cannot be regarded as being fully relevant from a seafarer's point of view.[8] Therefore, whereas it can be assumed that the passages refer to the two cities whose descriptions either derive from the author's first-hand knowledge (Roller 2018, 733) or from an uncredited source (which might have also been first-hand) (Roller 2014, 9), it can hardly be claimed that they derived directly from earlier nautical sources.

The three abovementioned approaches basically involve two categories of sources: those based on nautical sources, likely to be identified with Timosthenes' Περὶ λιμένων (i.e., the descriptions of the harbours of Mytilene, Knidos, Kaunos, Kition and Tyre), and those that were not (i.e., those of the harbours of Alexandria, Cyzicus and Smyrna). The references to the λιμένες κλειστοί pertaining to the first category could be tentatively dated to the third century BC, while the rest could be later and/or attributed to the first century BC, if it is accepted that they all derived from the author's autoptic experience. Returning to the question raised in the introduction – namely, to what extent λιμὴν κλειστός is consistently employed in the *Geography* – it can be contended that, while it is impossible to assume a priori that this is indeed the case, it is at least possible to assess whether or not those passages influenced by the same type of sources employ the expression in the same way, before comparing the findings.

THE 'CLOSED HARBOURS' IN STRABO'S *GEOGRAPHY*

In the *Geography*, the expression λιμὴν κλειστός appears nine times and probably refers to 10 harbour basins located in Cyzicus, Mytilene, Smyrna, Kaunos, Knidos, Kition, Tyre and Alexandria. Therefore, all the harbours labelled as 'closed' were located in the Eastern Mediterranean (Fig. 1). Bearing in mind the various possible origins of the passages containing the expression, the available archaeological evidence dating to the period between the third and first centuries BC will now be examined in order to attempt to determine its meaning in each case, following the order in which the references to it appear in Strabo's work. In particular, the focus is placed here on the presence, or absence, of those characteristics which in current scholarship are generally considered as synonymous of a 'closed harbour', that is, the existence of a harbour inside the walls of a city (Lehmann-Hartleben 1923, 65–74), its physical closure by chains or booms (Von Gerkan 1924, 113–14) or its use for naval purposes (Rougé 1966, 116–17). In this last case, the existence of shipsheds is understood here as a general indicator of the naval use of a harbour, since they normally housed warships. There is yet another possibility: as has been hypothesised in the case of the *Periplus of Ps.-Skylax*, the expression might have referred to harbours accessible through a naturally narrow or an artificially narrowed entrance (Mauro and Gambash 2020).

The first mention of the expression λιμὴν κλειστός refers to Cyzicus. Here, the text reports the presence of two 'closed harbours' and over 200 shipsheds, without specifying how many of them were located in each one (Strabo 12.8.11; cf. Apollonius Rhodius 1.940). Insofar as shipsheds, as just noted, normally housed warships, this passage possibly suggests that the city's fleet was moored in both harbours. Currently, there is no archaeological evidence supporting the existence of shipsheds in the harbours of Cyzicus, but as the city has not been satisfactorily excavated (Avram 2004, 983), Strabo's information cannot be simply ruled out.[9] With regard to

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[7]   Indeed, while Strabo (2.5.11) declared that he had travelled further than any other geographer (leading readers to believe that he had visited the whole Eastern Mediterranean), there is not information on all the stopovers that he made. The most complete reconstruction of Strabo's biography can be found in Roller (2014, 1–16).

[8]   See below for a discussion on the descriptions of the harbours of Cyzicus and Smyrna. As already observed, in a passage of the *Geography* Strabo accuses Timosthenes of ignoring some geographical regions, among which he mentions the region around the Pontus (2.1.41), which might explain why the description of Cyzicus (in the Propontis) in the *Geography* probably did not rely on his work.

[9]   Even though some scholars consider the existence of 200 shipsheds at Cyzicus unlikely, e.g., Lehmann-Hartleben 1923, 101; Blackman 2013, 21.

Fig. 1. Geographical location of the 'closed harbours' mentioned in Strabo's *Geography*.

the location of the harbours, there was probably a bay on either side of the bridges connecting the mainland with the island (ancient Arktonnesos),[10] both of which were located outside the city walls (Fig. 2).[11] As to their closure, there is no evidence for the existence of specific devices. The western harbour, which could be identified as the λιμήν mentioned by Apollonius Rhodius (1.954), was accessible through an entrance marked by a breakwater, still visible underwater at the beginning of the twentieth century. The eastern bay, now landlocked, was accessible through a small channel; to the north of the entrance, de Rustafjaell (1902) identified the foundations of a large structure in brick and granite, considering that this extended seaward to offer the entrance to the channel leading into the eastern bay further protection. Additionally, a third, inner, basin must have been located within the isthmus (Avram 2004, 985) and have been accessible, as a scholium on Apollonius Rhodius (1.954; Wendel 1935, 83) clarifies, from both bays through a channel.[12] Although Apollonius Rhodius mentions three basins, he praises as excellent only two

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[10]   *Ps.-Skyl.* §94; *FGrHist* 72 F 26; de Rustafjaell 1902; Sève 1979. Cf. *SIG*³ 799.II.2. Cyzicus was originally located on an island; nevertheless, the construction of these two parallel bridges connecting it to the mainland accelerated the accumulation of sand, thus transforming it into a peninsula as early as the end of the 4th century BC (Avram 2004, 983).
[11]   The city had no walls until 410 BC (Thucydides 8.107.1; Diodorus Siculus 13.40); it was fortified possibly soon afterwards. Remains of walls were identified by de Rustafjaell 1902.
[12]   This basin should correspond to the χυτὸς λιμήν mentioned by Apollonius Rhodius 1.987 and 1.990, whose entrance was fenced with stones by the Earth-born. De Rustafjaell (1902) identified a possible channel connecting the eastern harbour and a possible third, inner harbour, calling the latter 'Panormus', in reference to Apollonius Rhodius 1.954; such an identification has been rightly rejected by Lehmann-Hartleben (1923, 63–4). The channels connecting the two basins were silted up probably at the beginning of the 1st century AD, so that
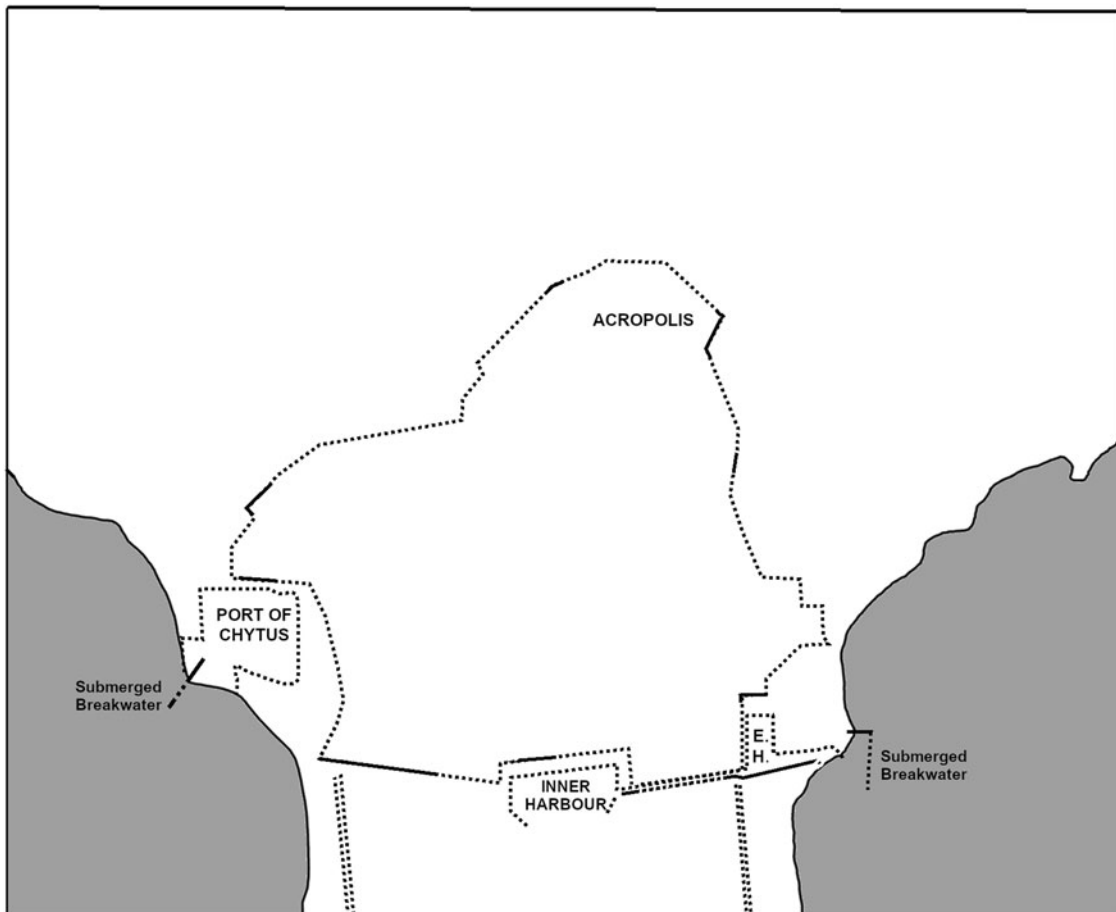
Fig. 2. Plan of Cyzicus, with the city walls, the two harbours on either side of the bridges (Western Harbour and E.H., Eastern Harbour), the possible third harbour (Inner Harbour) and the structures identified by de Rustafjaell. After de Rustafjaell 1902, pl. XI.

of them, the ones at the western bay and the inner harbour;[13] these basins probably corresponded to the two λιμένες κλειστοί mentioned by Strabo, as the eastern bay does not seem to have been spacious enough to accommodate a considerable number of shipsheds.

The second reference to a 'closed harbour' concerns Mytilene, on the island of Lesbos: here, the *Geography* specifies that the city was equipped with two harbours, of which one was closed.[14] In this regard, the text provides important details, specifying that the 'closed' harbour was the one lying on the southern side and that it had room for 50 triremes; in contrast, its northern counterpart is described as wide, deep and protected by a mole (Fig. 3).[15] The southern 'closed' harbour was located inside the city walls and its entrance was marked by a breakwater on the west side and a tower on the east.[16] In 1973, remains of the fortifications and the entrance towers were discovered near the

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Antonia Tryphaena, Princess of the Pontus (10 BC–AD 55), had to restore (ἀποκατασ[ήσ]ασα) them (see two inscriptions found at Cyzicus and commented on in Del Vecchio 2011).

[13]　Sève (1979, 349) considers the two external basins as the 'closed harbours'.

[14]　Strabo 13.2.2: ἔχει δ᾿ ἡ Μιτυλήνη λιμένας δύο, ὧν ὁ νότιος κλειστὸς τριηρικὸς ναυσὶ πεντήκοντα, ὁ δὲ βόρειος μέγας καὶ βαθύς, χώματι σκεπαζόμενος. The existence of two harbours in Mytilene is already recorded in *Ps.-Skyl.* §97: Μιτυλήνεν λιμένας ἔχουσαν δύο. Cf. Diodorus Siculus 13.79.5–6; Thucydides 3.3. On Mytilene's harbours, see also Mauro 2019, nn. 114 and 115, and C.M. Mauro's *Ancient Harbours Database*, at <www.ancientgreekharbours.com> (accessed 18 February 2022).

[15]　The two basins were connected by a channel, the "εὔριπος".

[16]　In relation to the eastern side of the entrance, the city walls ended in a tower (Theodoulou 2014).
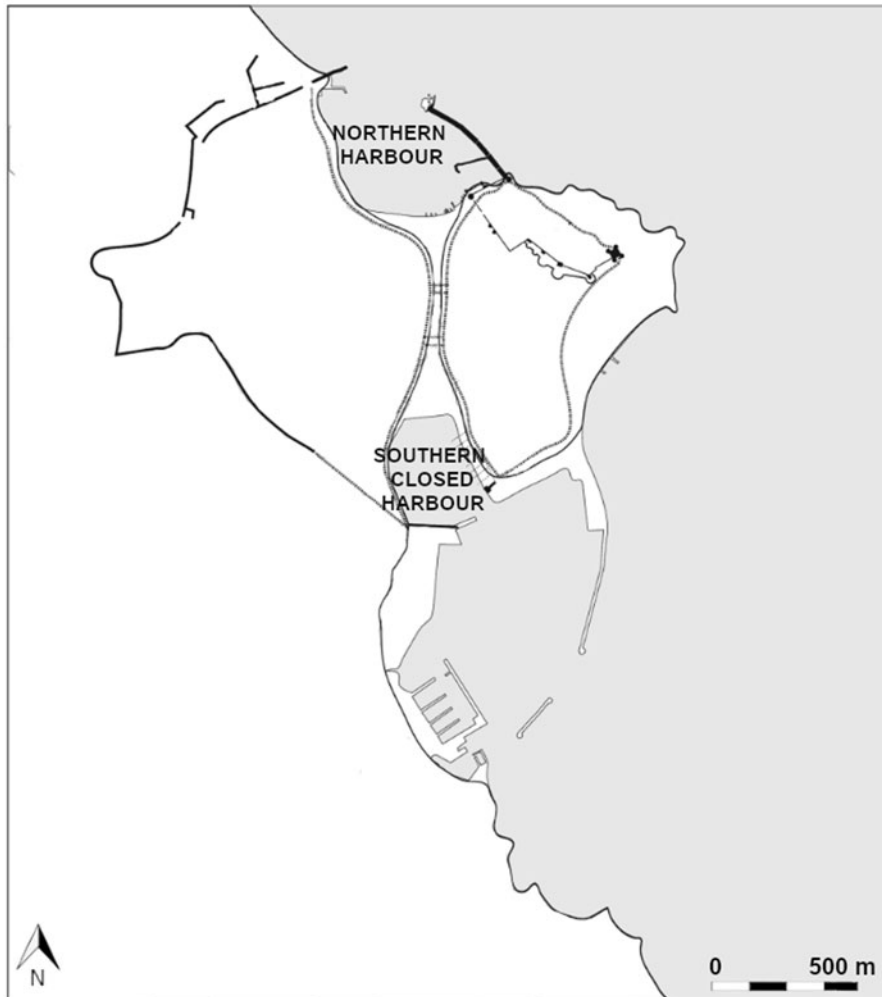
Fig. 3. Plan of Mytilene, on the island of Lesbos, with the city walls and the two harbours. After Baika 2013, fig. A11:5.

mouth, thus strengthening the hypothesis that this harbour might have been physically closed (Baika 2013, 218 n. 64). Additionally, it probably included a complex of shipsheds on its eastern shore, which has given rise to the suggestion that it was used chiefly for naval purposes (Acheilara 2004).

The most numerous references to the expression λιμὴν κλειστός are found in Book 14 (Strabo 14.1.2 and 14.1.9; Dueck 2000, 42). The first 'closed harbour' appearing in this book pertains to Smyrna. Here, the *Geography* initially records the existence of a harbour near the plain where most of the city was located, before mentioning a 'closed harbour' (Strabo 14.1.37). Comparing this testimony with that of Aelius Aristides – who states that there was a harbour in the centre of the city (Aelius Aristides, *Orations* 17.231),[17] plus a second outer one (Aelius Aristides, *Orations* 22.270–1)[18] – it is perhaps possible to contend that there were two basins at Smyrna.[19] Hellenistic Smyrna, which was rebuilt at the end of the fourth century BC across the gulf on Mount Pagos,[20]

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[17]   "... ὡς ὁ μὲν λιμὴν ἐν ὀμφαλῷ τῆς πόλεως ..." ('a harbour in the middle of the city').
[18]   Aelius Aristides, *Orations* 22.270: "... καὶ λιμένας τῇ μὲν κυκλουμένους τὴν πόλιν, τῇ δὲ ὑπὸ τῆς πόλεως μέσους ἐχομένους ..." ('the harbours that encircle the city and that are located in its centre').
[19]   If 'Old Smyrna' did indeed have two harbour basins (Cook 1958–9), the new city might have adopted a similar layout.
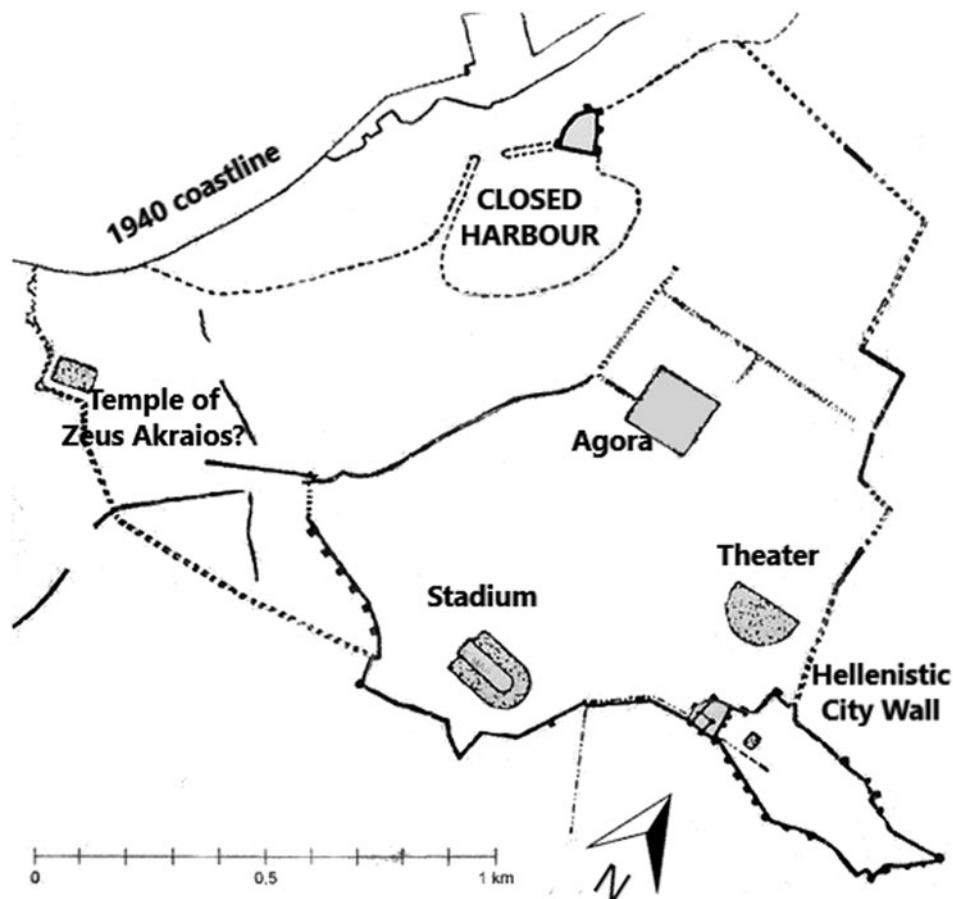[20]   The old city was located at the site of the town of Bayraklı.

Fig. 4. Plan of Smyrna, with the closed harbour and the Hellenistic city walls.

has since undergone significant changes. Such alterations in the site's geomorphology, consisting in the advance of the shoreline towards the north-north-west, combined with the continuous occupation of this area over time, have seriously undermined our archaeological comprehension of the Hellenistic settlement. However, the 'closed harbour' seems to be identifiable in the layout of a small, semi-circular basin still noticeable on the city plan (Fig. 4),[21] whereas the second outer harbour was probably located between the inner basin and Deirman-Tepe (Lehmann-Hartleben 1923, 126).

The next 'closed harbour' to be listed is that of Kaunos (Strabo 14.2.3).[22] This reference is unique since it is the only case in which the existence of a λιμὴν κλειστός is recorded in both the *Periplus of Ps.-Skylax* and the *Geography* (Ps.-Skyl. §99; Mauro and Gambash 2020). As with Smyrna, due to significant changes in its geomorphology, little is known about the topography of Kaunos. The harbour of Kaunos was located inside the city walls (Fig. 5) in a small basin close to the lower course of the River Calbis (Fig. 6);[23] this specific situation made the harbour particularly safe, as Thucydides himself defined it.[24] Over time, the accumulation of river sediments has drastically transformed the ancient harbour basin, to the point that it currently

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[21] This area is now completely silted up.

[22] Regarding the harbour of Kaunos, see Mauro 2019, no. 29.

[23] Moreschini 1997, 240. The fact that the River Calbis was navigable is confirmed by Strabo 14.2.2: εἶτα Καῦνος καὶ ποταμὸς πλησίον Κάλβις βαθὺς ἔχων εἰσαγωγήν.

[24] Thucydides 7.39, ἀσφαλής. Thucydides called Kaunos a 'secure place'; however, since the episode refers to ships finding shelter there, in all likelihood it was the harbour of the city in particular that was considered as 'safe'.
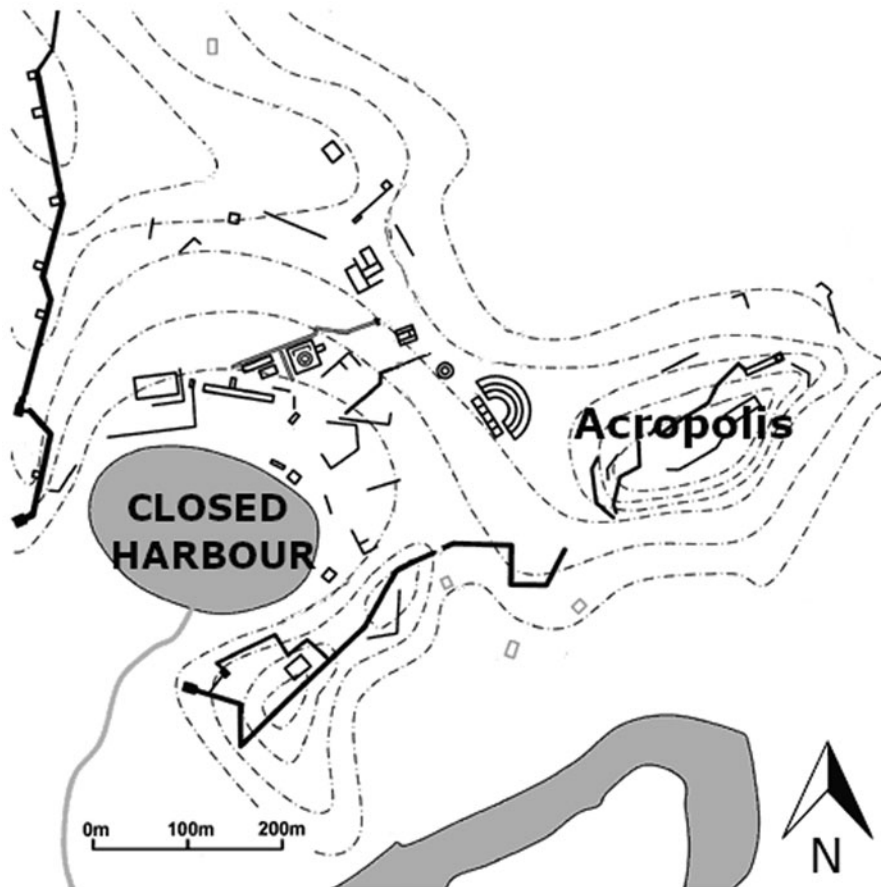
Fig. 5. Plan of Kaunos, with the closed harbour and the city walls.

corresponds to Sülüklü Gölü, a modest freshwater lake which in Antiquity was located on the western side of the acropolis (Gates 1996, 282; Brückner 1997, 67). The *Geography* also records the presence of shipsheds (Strabo 14.2.3).

Moving on to Knidos, the *Geography* records two harbours, one of which is referred to as 'closed' (Strabo 14.2.15).[25] The 'new' Knidos, which was re-founded on Cape Krio (present-day Tekir) at the end of the fourth century BC, was located on a small offshore island connected to the mainland by a narrow isthmus, on each side of which there was a harbour (Fig. 7). Although the orientation of the Knidian 'closed harbour' is not specified in the *Geography*, the only eligible candidate appears to be the north-western harbour, which is said to have been used by triremes and have been capable of berthing up to 20 ships. It was located inside a small natural bay, with a naturally narrow entrance (Fig. 8) and protected by the city walls; the pattern of the fortification and the existence of two towers flanking the mouth of the 'trireme harbour' have led some scholars to speculate on the possibility that its entrance could be blocked by chains or booms (Newton 1893, 349; Krischen 1938, pl. 2). Notwithstanding the fact that the entrance was scarcely wider than a normal gateway (McNicoll 1999, 54–9), no evidence of chains or booms has been found to date. Nowadays, the 'trireme' harbour is partially silted up, while the shipsheds mentioned by Strabo have yet to be identified.

On the island of Cyprus, the *Geography* reports the existence of a 'closed harbour' at Kition (Strabo 14.6.3). In addition to the fact that the ancient settlement is currently underneath the city of Larnaka, the changes in sea-level, tectonic mobility and silting phenomena (Nicolaou 1976; Gifford 1985; Morhange et al. 2000) all make it difficult to reconstruct the exact plan of

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[25]   For the two harbours of the new Knidos, see Mauro 2019, nn. 80 and 81.

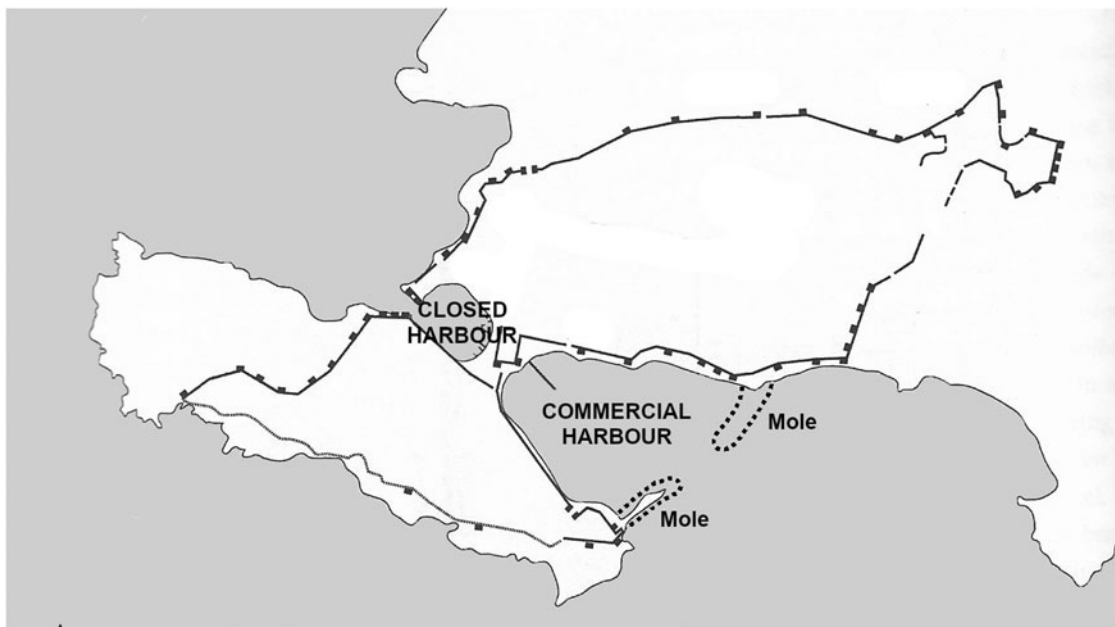Fig. 6. Photo of the present-day harbour area of Kaunos. Courtesy of Dick Osseman.

Fig. 7. Plan of Knidos, with the city walls and the two harbours. After Baika 2013, fig. A11:4.

the Hellenistic and Roman city. In the last centuries BC, the coastline would not have been as straight as it is today, for geological analyses have highlighted the presence of an embayment to the north of the settlement (Fig. 9). To the south, a second harbour area – usually referred to as Bamboula harbour – has been identified (Yon 2000, 111–12) and should probably be interpreted as the 'closed harbour' mentioned by Strabo (McKenzie 2013). The 'closed harbour' was thus

Fig. 8. Knidos, photo of the 'trireme harbour'. From a previous version of the website of the
Institute of Nautical Archaeology 2015.

accessible from the north and completely protected from the action of the sea by the western spit,
whose formation might date back to the sixth century BC (Morhange et al. 2000); additionally, it
was neither directly connected to the open sea, nor was it apparently located inside the city walls.[26]
On its west shore, there was a complex of shipsheds which was probably abandoned in 312 BC,
following the conquest of Kition by Ptolemy I Soter (Blackman 1996).

In Book 16, which contains the account of the Levantine coast, there is another reference to a
'closed harbour' in connection with Tyre, a city said to have had two harbours of which one was
closed (Strabo 16.2.23). Originally an island, Tyre was connected to the mainland by the siege
mole built by Alexander the Great (Arrian, *Anabasis of Alexander* 2.16.7–27.7; Curtius Rufus 4.2–
4; Diodorus Siculus 17.40–2; Plutarch, *Life of Alexander* 24–5; Marriner et al. 2005, 1303), and
was already joined to the mainland at the time Strabo or his source was writing. To the south and
to the north, the tombolo created two harbour areas. The southern, or 'Egyptian', basin is
described as ἀνειμένος ('open' or 'exposed'): indeed, even though it was partially protected by a
continuous line of natural reefs running in a north–south direction, the prevailing winds in this
area blow from the south-west, thus leaving this bay dangerously exposed. On the other hand, the
northern harbour, also known as Sidonian, is referred to as κλειστός by Strabo (Strabo 16.2.23).[27]

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[26]   Morhange et al. 2000; Carayon 2008, 367. The circuit of the city walls was suggested by Nicolaou (1976,
52–65), following mainly 18th- and 19th-century descriptions. During Yon's excavation, traces of a fortified wall
were found on the western edge of Bamboula harbour, to the north-west of the shipsheds (Yon 2000, 96;
McKenzie 2013, 352).

[27]   This designation is also found in Arrian (*Anabasis of Alexander* 2.20.9: καὶ ἐς μὲν τὸν λιμένα τὸν πρὸς Σιδῶνος;
and 10: τὸν πρὸς Αἴγυπτον), while Diodorus endorses the existence of more than one harbour in Tyre (17.42.4: τῶν
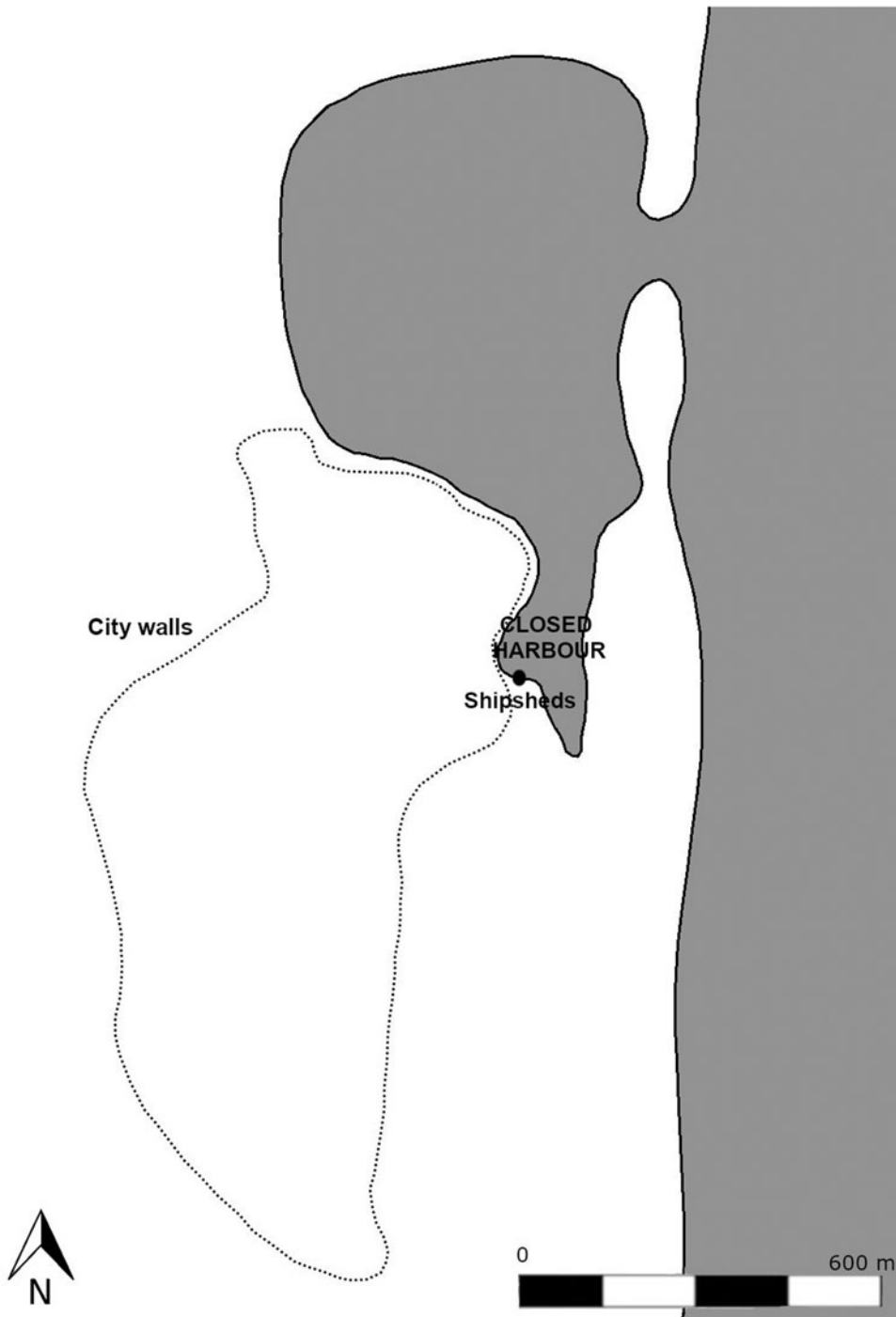λιμένων; and τοῖς λιμέσιν).

Fig. 9. Plan of Kition, with the alleged original course of the city walls and the closed harbour. The shipsheds are highlighted, despite the fact that they are not mentioned by Strabo. After McKenzie 2013, fig. B9:1*a*.

Besides being sheltered by a continuous line of natural reefs – which were probably visible above the surface and acted as a natural breakwater (Carayon 2008, 296) (Fig. 10) – the entrance to the northern harbour was further protected by a mole that contributed to narrowing it (Noureddine 2019). And as to its relationship with the city walls, it seems that the fortifications surrounded the perimeter of the basin without actually enclosing it (Lipiński 2004, 298; Noureddine 2019, fig. 3).
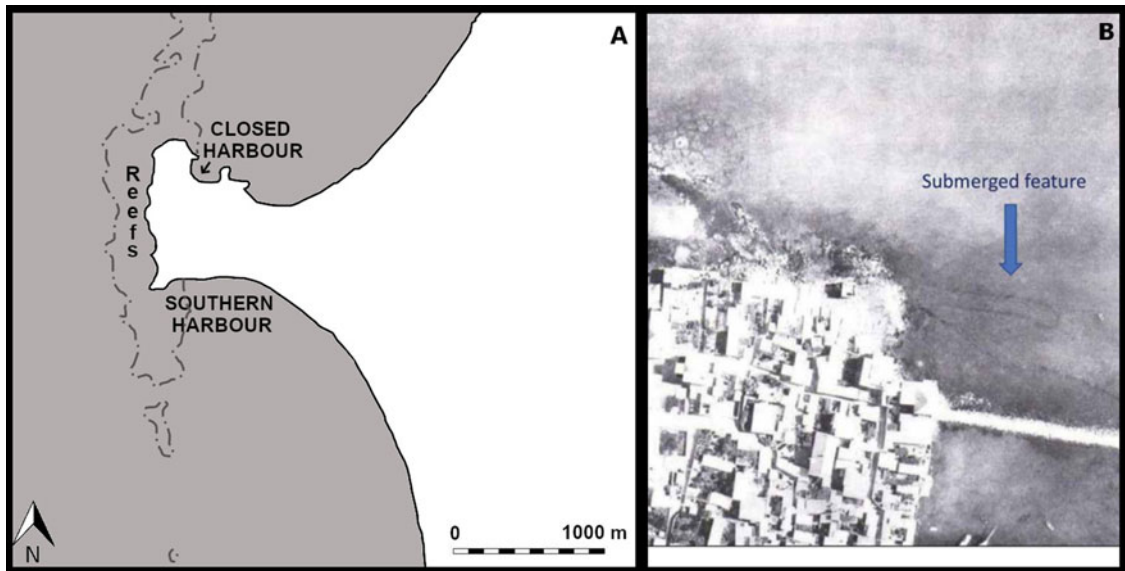
Fig. 10. A: plan of Tyre, with the two harbours and the submerged reef. After Marriner,
Morhange and Carayon 2008, fig. 2. B: aerial photograph of the northern harbour at Tyre,
Lebanon, signalling the location of the ancient mole (Noureddine 2019, fig. 2).

The fact that the northern harbour had a narrow entrance seems to be endorsed by Arrian (*Anabasis of Alexander* 2.20.9), who – when offering an account of Alexander's siege – stated that this characteristic allowed the Tyrians to block the harbour entrance by lining up triremes.[28]

In the case of Tyre, Strabo's brief description of the second harbour is particularly interesting, since he refers to it as being ἀνειμένος. This designation can be considered as being the antonym of κλειστός. So, while the entrance to the northern harbour was narrow owing to the reefs and the mole, the southern harbour had no natural or artificial protection whatsoever, thus resulting in it being 'open'.[29]

The last references to λιμένες κλειστοί appear in Book 17 in relation to Alexandria. The case of the Egyptian city is unique, since – as already observed – it is the only description among those examined here in which Strabo presumably relies on his autoptic experience, rather than on earlier sources. The expression λιμὴν κλειστός is employed twice and is always accompanied by the adjective ὀρυκτός, 'dug' (Strabo 17.1.6 and 9). While this could give rise to the impression that the same harbour is involved, a closer reading of the text dispels it. In the first passage, Strabo locates the 'closed and dug basin' beyond the *Eunostos* harbour (also called the 'Western Harbour'),[30] on the western side of the *Heptastadium* (17.1.6),[31] while in the second, he describes a 'closed and dug basin' to the east of the *Heptastadium*, specifically located close to Cape Lochias and the islet of Antirrhodos (17.1.9). In a third passage, he refers once again to a ὀρυκτὸς λιμήν (this time, without adding κλειστός) on the western side of the *Heptastadium*, specifying that it was called *Kibotos* (17.1.10).

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[28]   Diodorus confirms this episode, providing another interesting detail when mentioning that three ships were enough to block the entrance to this harbour (17.43.3: τῶν δὲ Τυρίων ἀνταναχθῆναι μὲν τῷ στόλῳ μηκέτι τολμώντων, τρισὶ δὲ ναυσὶν ὁρμούντων πρὸ τοῦ λιμένος). On Alexander the Great's Siege of Tyre, see Murray 2012, 95–100.

[29]   As suggested by Poidebard (1939, 5–75), the southern basin was probably an offshore anchorage, rather than a manmade harbour.

[30]   The first to explore this harbour was Jondet (1916), who identified an external breakwater, with regular gaps to prevent siltation, and a second inner one that improved the protection of this area.

[31]   The *Heptastadium* was a mole built in 280–270 BC, probably as part of the same harbour works as the lighthouse; see McKenzie 2003.
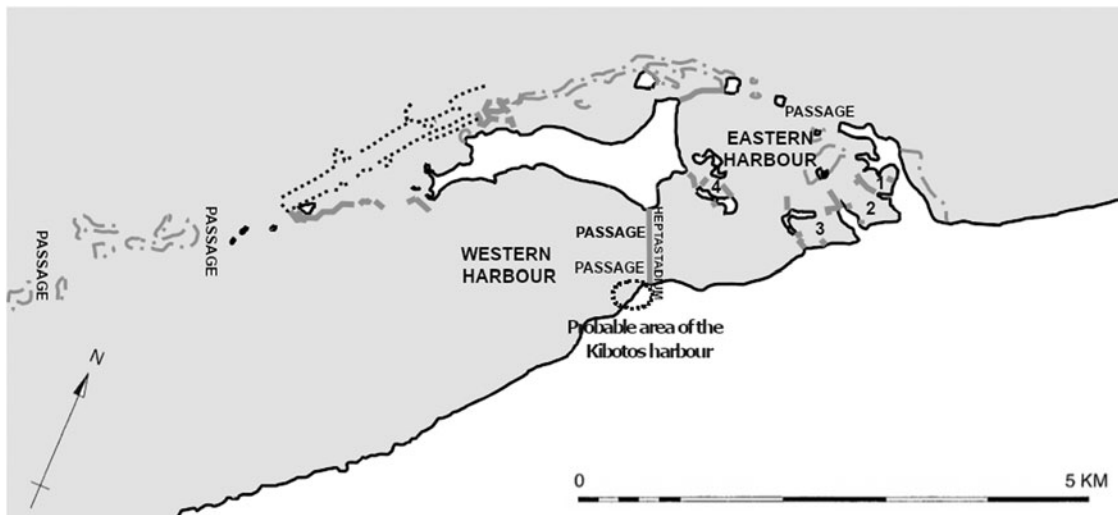
Fig. 11. Plan of Alexandria, with the submerged reefs, the *Heptastadium*, the two main harbour areas and the four basins inside the Eastern Harbour (the Great Harbour). After McKenzie 2003, fig. 2; the numbering of the basins inside the Eastern Harbour follows Belov 2015, fig. 9.

In light of the foregoing discussion, two harbours referred to as κλειστοί can be identified in Alexandria: one – the *Kibotos* – to the west, and another to the east of the *Heptastadium*. The *Kibotos*, as its name probably indicates, was a box-shaped basin located in the Western Harbour; it was dug out of the rock and connected to Lake Mareotis by a navigable manmade canal.[32] Since the Western Harbour was a wide embayment with no apparent sub-basin, other than the aforementioned *Kibotos*, Strabo's two references to a 'dug basin' to the west of the *Heptastadium* should both refer to it; vessels would have entered the *Kibotos* through a short sea channel on its northern side (El Fakharani 1984, 26), while another similar channel on its southern side would have allowed them access to the passage connecting the basin to the lake (Khalil 2010, fig. 4). Although it has not been precisely identified as yet, recent geological surveys suggest that the *Kibotos* was possibly located on the southern shore of the *Eunostos* harbour (Flaux et al. 2017) (Fig. 11). On the other hand, the second 'closed basin' was located to the east of the *Heptastadium*, in the Great Harbour (also known as the 'Eastern Harbour'). As Strabo himself suggests, it should be identified above all with the port at the foot of the royal palace (Belov 2015) (see Fig. 11:3); this basin, protected by piers, moles and the islet of Antirrhodos, had a narrow entrance through which only oared vessels could pass (Fig. 12).[33]

TOWARDS A DEFINITION OF 'CLOSED HARBOURS' IN STRABO'S *GEOGRAPHY*

In the *Geography*, Strabo employs the expression λιμὴν κλειστός probably to refer to 10 harbours located in eight different cities. This formula is always employed in the same formal way, namely, κλειστός is used as an adjective to describe a certain kind of λιμήν, rather than with the verb κλείω forming other constructions. In this sense, the situation that Strabo is describing is not identical to that referred to by Thucydides 7.38.2, who rather than recording the existence of a λιμὴν κλειστός in Syracuse is describing how Nicias asked the Athenian ships to be repaired and placed in front of the palisade, thus *creating* a sort of temporary λιμὴν κλειστός. On the other hand, Strabo's use of the expression appears to be consistent with the information

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[32] El Fakharani 1984. This channel is also documented in *Ps.-Skyl.* §107.1.
[33] The entrance to this harbour (Fig. 11:3) might also have been blocked by chains (Belov 2015).
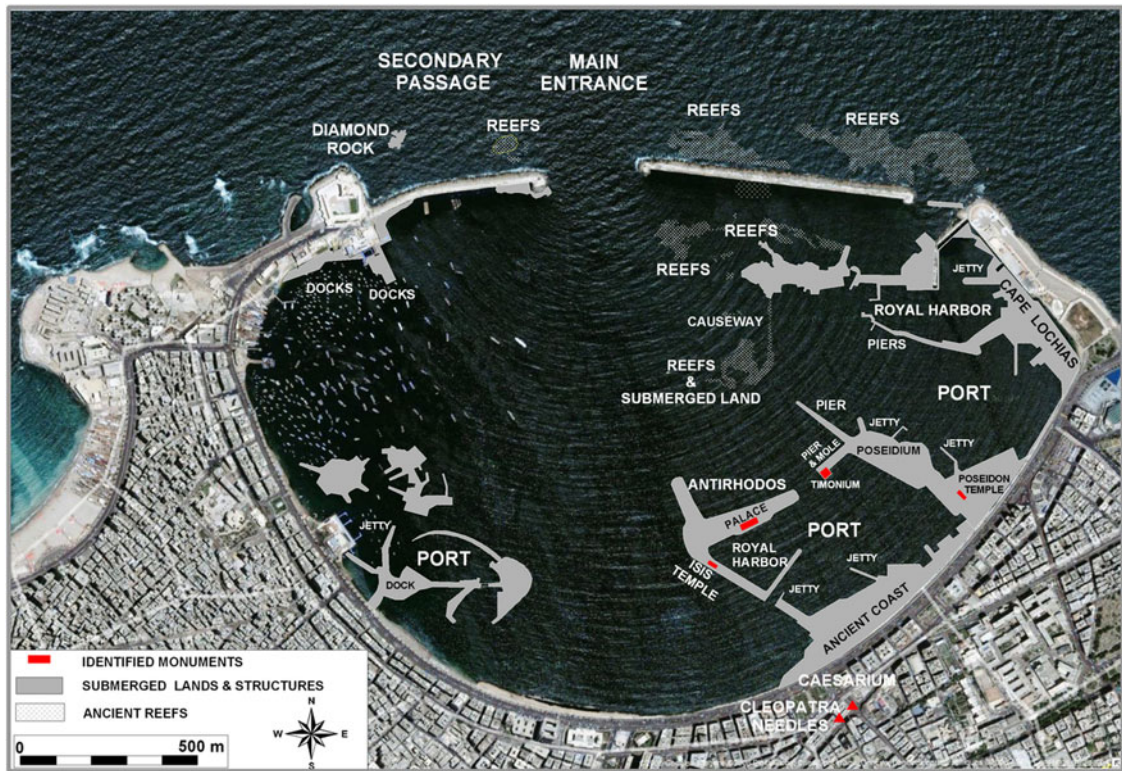
Fig. 12. Submerged remains of the ancient Great Harbour of Alexandria inside the modern
Eastern Port of the city (Goddio and Fabre 2010).

contained in the *Periplus of Ps.-Skylax* and other sources deriving from the Greek periplographic
tradition (i.e., Dionysus' *Description of Greece*), in which the formula is practically identical, even
though it is employed to refer to different harbours (Mauro and Gambash 2020). Such a
similarity may be explained in view of the fact that Strabo mainly drew on *periploi* or other
nautical sources containing schematic and verbal descriptions of the coast. Therefore, the
terminology employed in such accounts might have also found its way into those coastal
descriptions that were directly based on them.

Furthermore, it is worth noting that the expression λιμὴν κλειστός is employed uniquely in
relation to the Eastern Mediterranean. This does not necessarily imply that 'closed harbours'
from Alexandria westwards did not exist. Rather, it might reveal that this expression was coined
and commonly employed in eastern contexts.

As outlined in the Introduction, scholarship has provided different definitions of the expression
λιμὴν κλειστός over time, interpreting it variously as a harbour inside the walls of a city (Lehmann-
Hartleben 1923, 65–74), a naval base (Rougé 1966, 107–9) or a physically closed harbour (Von
Gerkan 1924, 113–14). Additionally, in a recent study focusing on the *Periplus of Ps.-Skylax*, it
has been proposed that the expression had a technical nautical origin and referred to harbours
particularly well-protected for their naturally or artificially narrow entrances (Mauro and
Gambash 2020). Can any of these definitions be applied to the λιμένες κλειστοί mentioned in
the *Geography*?

What a 'closed harbour' was possibly not in Strabo's *Geography*

In Strabo, there are different cases of λιμὴν κλειστός: cities with only one harbour, described as
'closed' (viz., Kaunos); cities with two harbours, both 'closed' (viz., Cyzicus); and cities with
many harbours, some of which were 'closed' (viz., Alexandria). Archaeological evidence available
for these places has revealed that some of the harbours defined as 'closed' were actually located

Table 3. Comparison between the previous theories and the archaeological evidence of harbours identified as λιμένες κλειστοί in the Geography. The question marks (?) indicate cases that are uncertain.

'CLOSED HARBOUR'	Inclusion within the city walls	Evidence for the existence of physical closures	Military purpose	Narrow entrance, assuring a high level of protection
Cyzicus, two 'closed harbours'			X	X
Mytilene	X	?	X	X
Smyrna	X		?	?
Kaunos	X		X	X
Knidos	X	?	X	X
Kition				X
Tyre				X
Alexandria, **KIBOTOS**	?			X
Alexandria, royal harbour	?		X	X

outside the city walls (e.g., Cyzicus and Kition), thus challenging the hypothesis of λιμὴν κλειστός as a harbour inside them (as proposed by Lehmann-Hartleben 1923, 65–74) (Table 3).

As for the naval use of 'closed harbours', in Strabo there seems to be a close correspondence between harbours of this kind and such a use, since the 'closed' harbours of Kaunos, Cyzicus and Knidos are said to have included shipsheds, while the 'closed' harbours of Mytilene and Knidos are explicitly associated with triremes, a type of vessel employed as a warship. However, this does not seem to have always been the case. The fleet of Alexandria, for example, was berthed in different basins within the Great Harbour, but only one of those basins is called κλειστός in the *Geography*.[34] Furthermore, the *Kibotos* has not been documented as a harbour exclusively given over to naval uses. Additionally, the interpretation of a 'closed harbour' as a naval base would not justify the presence of two harbours of this kind in Cyzicus or the fact that the only harbour in Kaunos is referred to as κλειστός. Therefore, although the association between a λιμὴν κλειστός and a naval base is more frequent in Strabo than in the *Periplus of Ps.-Skylax*, such a definition does not seem to encompass all the cases mentioned by him.

To determine what the expression λιμὴν κλειστός did not mean in Strabo, it is perhaps useful to consider the *periplus*-based descriptions of those harbours that are the opposite of the 'closed' kind. In the case of Mytilene, while the λιμὴν κλειστός is said to have berthed triremes, the other harbour is described as wide, deep and protected by a breakwater (Strabo 13.2.2). As regards Tyre, the text seems to create an opposition between the two extant harbours, one being κλειστός and the other ἀνειμένος (Strabo 14.2.23).[35] The dichotomy between the two terms is reinforced by the meaning of ἀνειμένος, which literally stands for 'open'. Considering the situation of the southern harbour of Tyre, ἀνειμένος might have referred to a natural anchorage, open to the winds and waves. As a matter of fact, even though it was partially protected by the north–south natural reefs, the southern harbour was, in any case, oriented towards the direction of the prevailing winds, which in this area blow from the south-west, thus being dangerously exposed. Following this observation, a harbour that was not κλειστός was therefore open – exposed – to the elements. Such a reading is strengthened by the description of the second harbour in Mytilene, which – despite not being 'closed' – is said to have been protected by a breakwater. All considered, it seems that in the *Geography* the expression λιμὴν κλειστός should be related to the physical protection of a harbour, rather than to its location inside the walls of a city or to its function.

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[34] On the different functions of the basins within the Great Harbour, see Belov 2015, 59–61.
[35] Ἀνειμένον is *hapax legomenon* in Strabo's *Geography*.

What a 'closed harbour' could possibly be in Strabo's *Geography*

After establishing what the expression λιμὴν κλειστός does not signify in Strabo's *Geography*, the time has come to evaluate the remaining options for interpreting it: either a harbour whose narrow entrance offered a high level of protection to ships (as hypothesised for the cases in the *Periplus of Ps.-Skylax* by Mauro and Gambash 2020) or a harbour whose entrance could be blocked by means of some sort of device (Von Gerkan 1924, 113–14). Actually, the two situations are quite similar, since in both the focus is on the harbour entrance. However, while in the first case this protection referred in all likelihood to the shelter that the basin offered against the action of the sea, in the second it should be interpreted as a form of defence against enemy ships. Having said that, the two hypotheses do not mutually exclude each other, as the existence of a narrow entrance – an important aspect for the protection of the basin – might have also been a prerequisite for installing suitable devices to block it. Therefore, assuming that the key to interpreting the expression lies in their protection, regardless of whether this referred to their natural characteristics or to their artificial closure, it is essential to focus on the mouths of the 'closed harbours' mentioned in the *Geography*, examining their nature in order to determine whether or not they might have been equipped with closure devices at the time when they were referred to as κλειστοί.

Closure devices could technically have existed since their use dates back at least to the second half of the fourth century BC, which means that they had already been documented before Strabo wrote the *Geography*. In particular, the first references to such mechanisms are to be found in both Aeneas Tacticus (*How to Survive under Siege* 11.3) and an Attic inscription (330–329 BC),[36] in which they are always referred to as κλεῖθρα.[37] Thenceforth, these devices continued to evolve, being widely documented in the Roman period (for instance, Appian, *Mithridatic Wars* 10.71; Livy 25.11.15).

However, even though in theory Strabo's 'closed harbours' might have been closed with specific devices, it is necessary to underscore two things. Firstly, the appearance of the expression λιμὴν κλειστός (documented from the fifth century BC onwards) predates the first mentions of κλεῖθρα (second half of the fourth century BC), so that an equivalence between the two concepts can be only assumed, but not automatically inferred. Secondly, the existence of closure devices blocking the mouths of the harbours (labelled as 'closed' by Strabo), has been suggested exclusively in the case of the harbours of Mytilene and Knidos. This is less clear in the other cases, as for some of them there is currently no evidence whatsoever of chains or booms blocking their mouths. Obviously, the current lack of evidence does not necessarily mean that they did not exist. In view of the current state of the knowledge, the closure of the entrances of certain 'closed harbours' mentioned by Strabo would have been a challenge, especially in the case of Kition where the entrance to the 'closed harbour' might have been 100 m wide (see again Fig. 9).

Given the apparent lack of closure devices in the harbours defined as κλειστοί and the possible nautical origin of some of the first references to the expression λιμὴν κλειστός, in a recent study it has been suggested that the expression might originally have referred to harbours with particularly narrow entrances,[38] before taking on the meaning of physically closed harbours (Mauro and Gambash 2020). A specification of this kind would have made sense if it derived from a practical nautical context, since the existence of a narrow entrance guaranteed ships greater protection inside a harbour (Mauro and Gambash 2020, 79). Moreover, as entering a harbour with a narrow mouth was a delicate operation, the nautical sources might have been interested

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[36] *IG* II² 1627, lines 317–19: ἀνφιδέαι σιδηραῖ στρογγύλαι ἀπὸ κλείθρου· IIII·.

[37] Yet, before 330 BC, the use of specific devices to block harbour entrances has yet to be explicitly confirmed by archaeological evidence. That the mouth of the harbour of Halieis (Argolid) was thus blocked has been rejected by Frost (1985). The existence of chains has also been hypothesised for one of the basins of the Piraeus, namely, Kantharos, but has yet to be archaeologically confirmed; see Rankov 2013, 436.

[38] Without discarding the possibility that some of these entrances could have lent themselves to the installation of lighter devices.

in recording this aspect. So, could this meaning also be applied to Strabo's 'closed harbours'? Due to the composite nature of the *Geography*, it is necessary to reassess this question.

At this point, it is important to recall the previously discussed distinction between the passages probably based on earlier nautical documents and those that were not. This allows us to distinguish between at least two different origins of the expressions at two different times, the first with a technical origin, probably dating from the third century BC, and the second with an autoptic one, corresponding to the time when Strabo himself was writing. To these two should be added a third period, comprising the cases of the two passages (dealing with Cyzicus and Smyrna) whose harbour descriptions have an uncertain origin.

Five passages mentioning and describing 'closed harbours' in the *Geography* probably drew on previous nautical knowledge, so that the existence of a λιμὴν κλειστός in these places should be dated to a period before Strabo's time (Mytilene, Knidos, Kaunos, Kition and Tyre). Following González Ponce (2016) and the numerous references to Timosthenes' work, it has been proposed above that the nautical sources used by Strabo might mainly date from the third century BC.[39] The descriptions of 'closed harbours' probably based on such sources are always concise and follow a similar pattern: they specify the number of harbour basins (in the main, one or two) and dedicate some lines to illustrating their main characteristics. The information provided here would have been valuable to seafarers, since it usually stipulates the orientation of the harbours or reports the existence of infrastructures (shipsheds, moles, etc.). All the harbours designated as κλειστοί and pertaining to this first group had in common well-protected basins that almost completely isolated them from the action of the sea. Such protection was basically ensured by the fact that their entrances took on the shape of bottlenecks, so that the waves reaching these 'closed harbours' had already been weakened by diffraction. This state of affairs could also be applied to the harbour of Kition, which was probably the 'closed harbour' with the largest mouth. Despite being approximately 100 m wide, its particular layout offered effective protection: evidence from the CX and CXI cores (Morhange et al. 2000) have, in fact, highlighted that there was no direct passage from the 'closed harbour' to the open sea, and it had to be necessarily accessed from the open maritime embayment to the north (Gifford 1985). Assuming a third-century BC nautical origin for these five references, the possible relationship between the expression λιμὴν κλειστός and the excellent protection offered by some harbours would therefore make perfect sense: *periploi* would have actually included information on the quality of the shelter offered by particular places.

As previously noted, the situation of the harbours of Cyzicus and Smyrna is more controversial. The uncertain origin of the information on them prevents us from speculating on its chronology. Cyzicus is the only city that is said to have had two harbour basins, both of them 'closed'; likewise, the *Geography* records that between the two they had 200 shipsheds, whereas on other occasions it offers individual descriptions of each one of them.[40] In this connection, the information on the harbour of Cyzicus seems to derive from a different kind of source, as *periploi* would have preferably contained accurate descriptions of both of its basins. As for Smyrna, the text contains two references to a harbour. The first uniquely records the existence of a 'closed harbour', but without providing any further details, while the second mentions a harbour located near a plain on which most of the city stood. Also in this case, the details are inconsistent with other descriptions of 'closed harbours', since they refer to the location of the harbour in relation to the city; such a specification – despite being interesting from a geographical perspective – does not provide seafarers with relevant maritime information.[41] The three 'closed harbours' recorded in Cyzicus and Smyrna were certainly accessible through narrow entrances (apparently natural, in the case of Smyrna; possibly partially artificial in the two cases of Cyzicus), but the

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[39]   Therefore, to a period in which the existence of λιμένες κλειστοί equipped with actual closure devices may not have been widespread yet.

[40]   As already noted, the other cases might have been borrowed directly from periplographic sources, in which specifying the number of shipsheds located in a basin was certainly a useful piece of information.

[41]   Mentions derived from *periploi* usually referred to the orientation of the harbours, not to their position in relation to their cities.

existence of closure devices cannot be confirmed as the two sites have not been satisfactorily excavated.

Finally, there is the case of Alexandria. Here, it was probably Strabo himself who employed the expression λιμὴν κλειστός to describe the two harbours, and it can therefore be dated to the late first century BC. The description of Alexandria's harbour system stands out from the rest for several reasons. First and foremost, it is extremely detailed, with the author devoting considerable space and effort to it. Additionally, the term λιμήν is variously employed to refer to the entire harbour system,[42] to the two main harbour areas (the Western Harbour and the Great Harbour)[43] and to the different harbour basins.[44] If on the one hand it can be regarded as extremely meticulous, on the other, this account is also the one that provides less useful maritime information from a seafarer's point of view. Despite its level of detail, it is paradoxically difficult to 'navigate' through the text from a nautical perspective: the word λιμήν is employed with various meanings, the description does not provide the orientation of the different harbour areas and it generally refers to 'several harbour basins', without specifying their exact position. When compared with the aforementioned cases, the greater geographical precision of the description of the Alexandrian harbours comes at the expense of less useful maritime information.

In the case of Alexandria, the basins that Strabo called κλειστοί should be identified with the *Kibotos* and the private royal basin of the Great Harbour, as the same author seems to suggest.[45] As with the previous 'closed harbours', they were also accessible through narrow entrances. Yet, in both cases, these were artificially achieved by digging out the rock (in the case of the *Kibotos*) or building jetties (the private royal basin). Were these basins physically closed? This would have been technically possible, but evidence of this has yet to be confirmed; moreover, it is necessary to stress that there were other basins in the Great Harbour, the entrances of which could have been theoretically blocked using the same kind of devices (Belov 2015, 59–61) (e.g., Fig. 9:3), but which were not referred to as 'closed'.

In sum, the different origins of the expression λιμὴν κλειστός identified in the *Geography* point to at least two slightly different meanings. On the one hand, the references probably borrowed from nautical sources (most probably Timosthenes' *Περὶ λιμένων* and dated to the third century BC) seem to identify a harbour that was well-protected because it was accessible through a narrow channel. In these cases, the expression λιμὴν κλειστός appears to contrast with harbours that did not offer good shelter. For example, the harbour of Mytilene that was not κλειστός is said to have been wide, deep and protected by a breakwater (Strabo 13.2.2), while the Sidonian harbour of Tyre is described as ἀνειμένος, literally 'open' (Strabo 14.2.23). In light of this, we suggest that in the nautical-based passages of the *Geography* the expression λιμὴν κλειστός is connected to a sort of physical protection of the basin, rather than to its location inside the walls of a city or to its function, as has been previously proposed. On the other hand, the interpretation of the passages that were not nautical based (those concerning Cyzicus, Smyrna and Alexandria) raises more doubts. As a matter of fact, neither can the references to closed harbours at Cyzicus and Smyrna be clearly dated, nor have the sites been satisfactorily excavated: the previously proposed hypothesis (the entrance to these basins through a narrow channel) could also be applied to these cases, but the lack of information makes it impossible to explore other possibilities. Finally, in the description of Alexandria, attributed to the first century BC, the expression is used twice. However, even if the two harbours were both accessible through a narrow mouth, this was not

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[42]   Strabo (17.1.6) describes the whole harbour system of Alexandria, comprising the two main harbour areas to the east and to the west, as one with two mouths (λιμένα πρὸς αὐτὴν ποιοῦν ἀμφίστομον).

[43]   Strabo (17.1.6) subsequently mentions *Eunostos* and the Great Harbour as two λιμένες separated by the *Heptastadium*.

[44]   According to Strabo (17.1.6), the Great Harbour was divided into several basins (καὶ εἰς πλείους σχίζεται λιμένας).

[45]   As he places the first 'closed harbour' in the Western Harbour, the artificial *Kibotos* appears to be the only candidate to which the expression can be applied. Further on, he mentions a 'closed harbour', defining it as the private basin of the kings and locating it close to the palace.

apparently a distinguishing feature, as in the Great Harbour there were other basins that might have deserved this designation.

ΛΙΜΕΝΕΣ ΚΛΕΙΣΤΟΙ IN OTHER SOURCES

At this point, after having discussed the use(s) of the expression in the *Geography*, it seems appropriate to take account of other references to it in order to broaden the perspective and to determine whether or not the meanings contained in Strabo are also recorded in other sources and whether or not further light can be shed on the issue.

As the majority of references to the expression λιμὴν κλειστός appear in the *Periplus of Ps.-Skylax*, they can be tentatively dated to at least the third quarter of the fourth century BC. Be that as it may, as various studies of this document have stressed, these references might have been borrowed from previous nautical sources and therefore have an earlier date (Mauro 2022). As with those appearing in Strabo's *Geography*, the references contained in the *Periplus of Ps.-Skylax* are not analytical. On the contrary, they are included in what appears to be a brief list of places coming into, or passing out of, sight. Despite this limitation, two observations can be made to clarify the meaning of this expression in the *Periplus of Ps.-Skylax*. First and foremost, these references could be slightly earlier than the first examples of artificially closed harbours and, second, the author identifies harbours inside city walls with the expression "λιμένες ἐντὸς τείχους" (*Ps.-Skyl.* §§13 and 104), thus suggesting that a 'closed harbour' is not synonymous with a harbour located inside the walls of a city. This has led to the suggestion that the references contained in this document might have derived from an expression originally used by seafarers to identify particularly safe harbours, owing to the fact that they were accessible through narrow entrances (Mauro and Gambash 2020).

The only possible literary, contemporary use of the expression appears in a fragment attributed to either Philochoros of Athens (fourth–third century BC) or Menekles (second–first century BC),[46] in which it is claimed that the three basins of the Piraeus were 'closed' (see again Table 1); however, the dating of the passage is uncertain, and it also employs the expression without providing further specifications.

Additional information on the meaning of the expression can be gathered from a dedication on an altar that the *epistates* Biares offered to Apollo Didymeus: the inscription, found in front of the so-called Lion Gate at Miletus and dated to 85 BC, contains a mention to a λιμὴν κλειστός (*Milet* II.3.400)[47] and has been traditionally referred to as the Lion Harbour.[48] According to this text, Biares was responsible for 'the temple of Apollo of Didyma and the walls and towers and the security of the closed harbour'. While the inscription does not offer insight on the meaning of the expression, it mentions the walls, the towers and the 'closed harbour' as three different elements, thus suggesting that a λιμὴν κλειστός could be found independently of the existence of the other two. Furthermore, if one individual was deemed sufficient to ensure the security of all these places (i.e., the temple, the walls, the tower and the harbour), it means that that they were all located nearby and that the access to the harbour could be easily supervised. This hypothesis finds an *in situ* confirmation, since recent geomagnetic analyses revealed the presence of two anomalies at the entrance of the Lion Harbour, probably two quays reducing the mouth of the basin to a width of barely *c.* 20 m (Brückner et al. 2014, 70).

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[46] The two references to the expression recorded in Dionysus son of Kalliphon have been excluded, since they derive from the use of a source common to both this author and the *Ps.-Skylax* (Marcotte 1990, 29–31; Shipley 2011, 15).

[47] Βιάρης Βιάρου ἐπιστατήσας τοῦ ναοῦ τοῦ Ἀπόλλωνος τοῦ Διδυμέως καὶ τειχῶν κ[αὶ]/ πύργων καὶ τῆς περὶ τὸν κλειστὸν λιμένα ἀσφαλήας Ἀπόλ[λωνι] Διδυμεῖ καὶ Ἀρτέμιδι Πυθ[είηι καὶ] τῶι Δήμωι ἱδρύσατο τὸν βωμόν.

[48] Brückner et al. 2014, 64. The Lion Harbour receives is name from the two statues of lions found at its entrance and dated to the second half of the 4th century BC. Strabo mentions the harbours of Miletus at 14.1.6; however, his information is extremely vague and concise, and it refers only to the number of the extant basins and to the size of one of them (without further specifications).

The expression λιμὴν κλειστός also appears in Dio Cassio (75.10.5), who, when referring to the harbours of Byzantium, states that those within the walls (οἵ τε λιμένες ἐντὸς τείχους) had been closed with chains (ἀμφότεροι κλειστοὶ ἁλύσεσιν ἦσαν) and that their breakwaters, surmounted by towers, jutted far out into the sea on either side, thus hindering the approach of enemy ships (καὶ αἱ χηλαὶ αὐτῶν πύργους ἐφ᾽ ἑκάτερα πολὺ προέχοντας ἔφερον, ὥστ᾽ ἄπορον τῷ πολεμίῳ τὸν πρόσπλουν ποιεῖν). Notwithstanding its rather later date, this testimony offers food for thought: it underscores, yet again, the fact that closed harbours do not correspond to harbours inside city walls (two different expressions are used, as documented in the *Ps.-Skylax* and in the Milesian inscription). Additionally, it specifies *how* their narrow entrances – created by building towering breakwaters on either side – were closed, as if κλειστοὶ on its own did not imply the existence of specific devices.

Apart from the references to λιμὴν κλειστός, there are other sources that contain κλεῖθρα, a term clearly related to devices actually capable of blocking a harbour entrance. As already observed, a harbour defined as κλεῖθρα is firstly recorded in written sources at the end of the fourth century BC and is explicitly linked to the presences of closure devices (Aeneas Tacticus, *How to Survive under Siege* 11.3; *IG* II² 1627, lines 317–19). Moreover, these sources also refer to the existence of κλεῖθρα, between the third and the first centuries BC, in the harbours of Kos (*SEG* 43.549, fragment B, lines 3–5)[49] and Chalcedon (Appian, *Mithridatic Wars* 10.71; 74 BC), but which – despite being mentioned as localities by Strabo (Kos: 14.2.19; Chalcedon: 12.4.3) – are not described as λιμένες κλειστοί. Therefore, even if the two expressions (λιμὴν κλειστός and κλεῖθρα) were certainly somehow related and a correspondence between the two can be suggested (at least to a certain extent), in view of the current state of the knowledge their association cannot be automatically conjectured.

CONCLUSIONS

The analysis of the λιμένες κλειστοί mentioned by Strabo offers different points for further reflection, while allowing us to approach the meaning of this expression in the *Geography*. In the Introduction, we identified three main goals: to determine whether or not this expression is employed consistently in his work; to gain further insights into its meaning in the *Geography*; and to compare the findings with other references to the same expressions.

With regard to the first point, we have highlighted how the composite nature of Strabo's work prevents us from assuming a priori that the expression is consistently employed. Therefore, we have discussed the possible origin of the references to λιμὴν κλειστός, suggesting that the passages in which it appears can be traced back fundamentally to two kinds of sources: those based on nautical sources and those that were not. As to the former, the references seem to allude to something relating to the entrances of these harbours. In particular, the archaeological and geomorphological situation of these harbours at the time when they were referred to as 'closed' suggests that they were all only accessible through a narrow channel that completely separated their basins from the action of the sea. Additionally, this observation is reinforced by a reading of the descriptions of those harbours that were contrasted with λιμένες κλειστοί. On the other hand, the information drawn from the sources that were not based on previous nautical documents is difficult to date and to interpret with certainty. As the passage describing Alexandria was based on Strabo's personal experience, it can be easily traced back to the late first century BC; by contrast, it is more difficult to determine the provenance of the information contained in the descriptions of harbours in Cyzicus and Smyrna. Be that as it may, when considering the archaeological and geomorphological evidence available for the 'closed harbours' of Alexandria, Cyzicus and Smyrna, the definition that we have proposed for the references deriving from earlier nautical sources seems to be applicable, although questionable, for – at

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[49] τῶν νεωρίων τῶν κα|τεσκε[υασμ]ένων τοῖς κλείθροις διαλείπων εἴσοδο[ν] | ἐκ τῶν ναυπαγίων (196–195 BC).

least in the case of Alexandria – a narrow entrance would not be the only distinguishing feature of the two harbours designated as 'closed'. Even so, in these three cases the expression seems to imply the protection offered by those harbours.

Finally, with regard to the third question, the analysis of the additional *comparanda* partially endorses what has been found in the *Geography*. While it does not contribute to identify a term that exclusively referred to the actual closure of the entrances of harbours designated as "κλειστοί" by means of devices, it does allow for ruling out two of the more common hypotheses on the meaning of the expression, insofar as none of the literary sources examined here employ it to refer to the military function of a harbour or its location within the walls of a city.

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Ανάλυση των «κλειστών λιμένων» στη *Γεωγραφία* του Στράβωνα: Υπόβαθρο, φύση και σημασία της έκφρασης

Η έκφραση λιμὴν κλειστός εμφανίζεται 29 φορές στις αρχαίες ελληνικές λογοτεχνικές πηγές. Ωστόσο, υπάρχουν τέσσερις διαφορετικές ερμηνείες και τρεις πιθανές αγγλικές μεταφράσεις. Ως συμβολή στη συνεχιζόμενη συζήτηση για το νόημα της έκφρασης, η παρούσα εργασία αναλύει τις εμφανίσεις της στη Γεωγραφία του Στράβωνα. Αυτό το έργο, με τις εννέα αναφορές του, είναι, στην πραγματικότητα, η δεύτερη κατα σειρά εμφανίσεων πηγή στην οποία εμφανίζεται συχνά. Ειδικότερα, θα δοθεί έμφαση σε δύο ζητήματα: τον βαθμό στον οποίο η έκφραση χρησιμοποιείται ευλόγως στη Γεωγραφία και την πιθανή προέλευσή της. και ποια έννοια (αν υπάρχει) μπορεί να της αποδοθεί. Προκειμένου να υπάρξει μια περαιτέρω εικόνα για το νόημα της έκφρασης, οι προαναφερθείσες περιπτώσεις «κλειστών λιμανιών» θα συγκριθούν με τα διαθέσιμα αρχαιολογικά και γεωμορφολογικά στοιχεία.

Μετάφραση: Maria Olimpia Squillaci