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LIMENES.

THE TERMINOLOGY OF THE MEDITERRANEAN PORTS OF THE ROMAN EMPIRE AS DOCUMENTED IN THE LITERARY SOURCES

by

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ABSTRACT

This research forms part of the Portus Limen Project, which investigates Mediterranean port networks in the Roman Empire. The aim of my research is to investigate the precise semantic and pragmatic implications of the Greek and Latin terms referring to ports or anchorages, especially in relation to one another: what does each harbour form require? Where is it located? What are its singularities in relation to other harbour forms?

My research represents an ontological approach to the study of the Greek and Roman port terminology. A literature review is included, where I discuss the relevant modern research methods. However, this review appears twofold, due to the novelty of combining linguistics research with archaeological finds – two disciplines that are rarely combined with one another. Next, I describe my methodology, based on text mining, decomponential analysis and prototype theory applied to ancient Greek and Latin texts as the only direct testimonies of speech acts in those languages. This leads me to the exposition of all relevant data as far as possible for the period and for the space chosen. I discuss in the first place the usage of each harbour term in isolation in order to seek its prototype. Secondly, I include two case-studies in order to verify if the conclusions reached in the theoretical discussion do apply in the realities on land, and how the different harbour terms co-exist and interact with one another by means of particular sites. Finally, I provide further discussion on the ontological relations between different port terms. In the end, I hope I am offering satisfactory conclusions on the semantics and pragmatics as to the usage of ancient Greek and Latin harbour terms, as well as some ideas for future work.

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THE TERMINOLOGY OF THE MEDITERRANEAN PORTS OF THE ROMAN EMPIRE AS DOCUMENTED IN THE LITERARY SOURCES

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ABSTRACT (FRANÇAIS)

Cette thèse fait partie du Projet Portus Limen, qui mène des recherches sur les ports maritimes de l'Empire Romain. L'objectif de cette thèse est de clarifier les implications sémantiques et pragmatiques des différents mots en Grec et en Latin qui désignent des types portuaires. Ma recherche représente une approche ontologique au sujet du vocabulaire portuaire ancien.

Après l'introduction au sujet, nous avons inclus une critique bibliographique en discutant l'état de la question jusqu'à ce jour. Cependant, le manque de projets interdisciplinaires a resulté en une critique bibliographique structurée en deux parties. D'abord, nous présentons les théories qui nous permettront de rédiger une analyse sémantique, en particulier les techniques de la discipline nommée Cognitive Linguistics, ainsi que la Prototype Theory. Après ces considérations, nous présentons les ouvrages de thématique archéologique, plus notamment Rougé (1966), qui a fait une première tentative de clarification de ce vocabulaire.

On pourrait dire que le premier sémanticien moderne a été Ferdinand de Saussure, qui pour la première fois a démontré la division des mots entre signifié et signifiant. La discipline des Cognitive Linguistics a été développée quelques années plus tard, et son objectif principal est de comprendre l'utilisation des mots dans leur contexte. À cet effet, les relations entre les mots peuvent se représenter comme dans des familles, à la manière des familles d'animaux ; mais aussi dans des cadres de signifié avec des traits positifs et négatifs. Ces techniques seront utiles dans notre chapitre 6 pour visualiser ce que chaque terme portuaire est (ou n'est pas), et quelle est sa relation avec les autres termes. Cependant, il faut d'abord analyser chaque terme pour lui-même. À cet effet, nous chercherons à trouver un prototype afin d'analyser des grands corpus textuels et observer les traits communs dans une grande multiplicité de contextes (chapitre 4). Finalement, dans notre analyse, nous avons aussi inclus des traits complémentaires, avec pour intention de compiler la totalité des données.

La méthodologie pour cette thèse consiste en l'examen de la littérature ancienne grecque et latine. D'abord, nous avons dû établir une chronologie pour délimiter un corps assez long de textes littéraires. Cette chronologie a été établie dès Polybe, avec ses narrations des guerres puniques, jusqu'à Procope, vers la chute de l'Empire Romain d'Occident. La question se pose de la validité des sources, en particulier de celles qui ne produisent pas des textes originaux, mais qui profitent des données des auteurs antérieurs, comme par exemple Strabon et Pline l'Ancien. Pourtant, il semble clair que si les auteurs conservés ont utilisé ce vocabulaire, en conséquence la terminologie présente dans leurs textes était comprise par leurs contemporains, et donc il s'agit de sources textuelles valides pour notre recherche.

Dans notre thèse nous n'avons pas voulu fournir les traductions des mots objets de notre étude, parce que les traductions impliquent des assomptions qui peut-être seraient erronées. Nous avons fourni des traductions des textes en l'anglais (principalement dans le volume des annexes) pour faciliter la consultation des textes, mais nous avons décidé de seulement translitérer les mots pour éviter des connotations. En effet, les langues ne sont pas totalement équivalentes les unes avec les autres.

Un autre souci c'est que les théories linguistiques qui peuvent mieux servir notre propos ont été créées par des locuteurs vivants, à qui on peut poser des questions. Cependant, il est clair que le grec ancien et le latin ne sont plus des langues parlées couramment. Pour cette raison, on a dû travailler à partir des textes à la place des personnes.

Les données des textes, que nous avons extraits dans des cherches sur les sites du Thesaurus Linguae Graecae et du Packhard Humanities Latin Institute, ont été introduites dans les bases de données du Projet Portus Limen. Cette classification a permis de rédiger des études sur les mots suivants: en grec, λιμήν/limen, ἐπίνειον/epineion, ἐμπόριον/emporion, ὅρμος/hormos, σάλος/salos, ναύσταθμον/naustathmon, αἰγιαλός/aigialos, et ἀγκυροβόλιον/ankyrobolion; en latin, *portus, statio,* et *litus.* Nos investigations se sont centrées sur les points suivants: premièrement, une compilation des définitions présentes dans les sources gréco-latines, comme par exemple la *Souda* ou les collections étymologiques. Après cela vient une petite étude étymologique, qui permettra de clarifier l'évolution du mot. Finalement, nous observerons les caractéristiques des mots notées dans la littérature conservée, en les divisant entre caractéristiques essentielles et autres informations. Après les données plus théorétiques, nous avons inclus deux études de cas,

qui permettront de vérifier et compléter les observations théorétiques. Ces études de cas ont été choisies en raison d'une quantité suffisante de renseignements. Il s'agit du port d'Alexandrie en Egypte et des systèmes portuaires des régions de Puglia, Basilicata et Calabria. Une discussion sur tous les points est présentée au chapitre 6, et finalement dans le chapitre 7 nous avons inclus des mots de conclusion et des possibilités de travail pour l'avenir.

Après nos recherches, il deviendra clair que λιμήν/limen et *portus* fonctionnent comme le terme basique pour désigner un port, généralement dans une ville et avec de l'infrastructure. Les sources notent aussi des éléments du paysage qui peuvent être utiles, comme des montagnes (par exemple pour s'orienter), mais l'infrastructure portuaire n'est pas nommée d'habitude, avec l'exception des moles. Des installations comme grues et magasins sont rarement notées dans la littérature ancienne. C'est le même cas pour les travailleurs des ports qui faisaient la cargaison et le déchargement des marchandises, ceux qui goûtaient les produits pour s'assurer de leur qualité, ou le corps de police. Pour faire des recherches sur ces points, on devrait probablement se servir de l'épigraphie et de l'iconographie. Finalement, le λιμήν/limen en certaines occasions peut aussi désigner des bassins dans un complexe portuaire plus gros, mais il n'est pas clair que ce soit aussi le cas de *portus*.

Le ὅρμος/hormos, quand il ne désigne des points concrets d'ancrage dans les ports, est un ancrage de qualité secondaire, ou dans un village d'importance mineure. Les ὅρμοι/hormoi sont toujours importants parce que dans ces lieux les marins peuvent trouver de l'eau à boire. Ces ports sont généralement situés dans des baies ou bien protégés par des caps.

L'ἐπίνειον/epineion est un port qui est contrôlé par une ville différente de celle où il est situé. C'est-à-dire, il s'agite d'une relation politique. Cependant, les sources ne semblent pas faire le point sur la distance entre les deux localisations, comme c'est le cas entre Athènes-Pirée ou Pergamon-Elaia. Les ἐπίνεια/epineia sont établis probablement par des raisons commerciales, et pour cette raison ils sont considérées comme des lieux pleins de richesse.

L'ἐμπόριον/emporion est le port de commerce, ou bien la zone de commerce d'un port. Il est difficile d'établir des comparaisons entre l'ἐμπόριον/emporion grec et l'ἐμπόριον/emporion dans l'Empire Romain, parce que les structures politiques sont

différentes. Cependant, l'ἐμπόριον/emporion comme zone de commerce de gros et de redistribution a une forte relation avec son hinterland, et il offre aussi des installations comme des magasins, des hôtels, etc. Contrairement à l'ἐμπόριον/emporion, le ναύσταθμον/naustathmon est le port militaire, ou bien la zone militarisée du port.

L'αἰγιαλός/aigialos et le σάλος/salos désignent des ancrages sans infrastructure. Le σάλος/salos est l'ancrage à mer ouverte, et l'αἰγιαλός/aigialos se réfère à la plage. On utiliserait l'ancrage à mer ouverte quand il n'est pas possible d'arriver à la côte, par exemple parce que l'eau n'est pas suffisamment profonde ou en cas de tempête. L'αἰγιαλός/aigialos, qui correspond au *litus* latin, s'utilise en cas d'une urgence, ou bien pour y trouver de l'eau à boire, parfois aussi en raison des opérations militaires. Les renseignements sur l'ἀγκυροβόλιον/ankyrobolion ne sont pas suffisants pour en donner une description.

Finalement, le terme latin *statio* est énormément polysémique. Quand il se réfère à un port, il désigne une forme d'ancrage temporaire. Ceci est dû par exemple au fait que la *statio* n'est pas la destination finale du bateau, ou bien parce que le bateau ne peut pas bien approcher la côte et il faut faire du transbordement des marchandises.

Dans les études de cas, nous avons fait différentes observations. Premièrement, le port d'Alexandrie nous montre comment un même lieu pouvait être désigné par des termes différents: λιμήν/limen, ὅρμος/hormos, *portus*. En conséquence, l'utilisation de chaque terme dépend des connotations précises que chaque utilisateur de la langue veut donner à chaque moment.

L'étude de cas italien nous apporte des exemples de systèmes portuaires. En effet, les binômes Thurii-Rouskiane, Kallipolis-Tarentum, et Fratuentium-Tarentum sont hautement illustratifs de ce que signifie l'ἐπίνειον/epineion entant que port contrôlé ou dépendant d'une autre ville. Cet étude de cas nous sert aussi à visualiser les déficiences de nos données, particulièrement en ce qui concerne Vibo Valentia et Medma. Dans ces deux cas, la littérature n'est pas suffisante, mais aussi les fouilles archéologiques ne sont ni abondantes ni récentes, et on aurait urgemment besoin de les mettre à jour. Finalement, l'étude de cas italien a aussi fourni une hypothèse sur la localisation du ὅρμος/hormos près de Brundisium nommé dans les sources sur la guerre civile.

Un cadre de signifiés est inclus dans le chapitre 6. Comme on verra pendant la thèse, en grec tous les autres termes coexistent avec λιμήν/limen. Ce fait indique la condition de terme à niveau basique de cette parole. Au contraire, le reste des termes portuaires apparaissent rarement à côté les uns des autres. D'autre part, ceci est logique entant que chacun des autres termes implique des traits spécifiques différents, qui parfois sont incompatibles.

Λιμήν/limen est documenté avec ὅρμος/hormos avec une très haute fréquence. Le fait que tous les deux, λιμήν/limen et ὅρμος/hormos, sont utilisés à deux niveaux (respectivement: le port et le bassin du port; l'ancrage en général ou le point d'ancrage concret) peut paraître difficile à discriminer, mais normalement les textes sont assez clairs (par exemple, Chariton, *Callirhoe*, 1.11.4-2.1.9, où le ὅρμος/hormos existe par opposition au λιμήν/limen de Milet).

Le syntagme λιμήν εὔορμος (limen euormos) mérite quelques considérations. Il apparaît dans des sources comme Appien, *Guerres Puniques*, 347, en référence à Utique. Cette fois, le εὔ-ορμος/eu-ormos se réfère aux points d'ancrage concrets dans le port. Si un adjectif comme εὐλίμενος/eulimenos désigne la qualité de toute la côte, le mot εὔ-ορμος/eu-ormos se limite aux installations d'ancrage spécifiquement.

À l'exception de λιμήν/limen avec ὅρμος/hormos, l'autre expression la plus fréquente est λιμήν/limen avec ἐπίνειον/epineion. Dans ce cas, la différence s'agit du point de vue: si l'on parle de la ville qui contrôle le port, ou bien du port. Par exemple, pour Corninthe, Cenchreae et Lechaeum sont des ἐπίνεια/epineion, mais pour les habitants de ces deux villes, il s'agit de λιμένες/limenes. Des exemples de ce phénomène peuvent se trouver chez Pausanias 2.2.3 et 7.26.14, et aussi chez Strabon, 9.1.4. À nouveau il est important de faire le point sur la différence entre le λιμήν/limen 'basin du port' par opposition à tout le port. En ce cas, l'ἐπίνειον/epineion était le complexe entier et le λιμήν/limen le bassin concret. Quelques cas d'ἐπίνειον/epineion, comme Strabon 8.6.25, documentent des villes qui avaient un port, mais qui sont abandonnées et reconstruites dans une autre localisation. Cependant en ces cas la vieille ville est toujours utilisée grâce à son port.

À l'exception de ces termes, ἐπίνειον/epineion et ὅρμος/hormos, λιμήν/limen coexiste avec une fréquence mineure avec les autres termes portuaires grecs. Par exemple, il n'y a pas beaucoup de cooccurrences avec ἐμπόριον/emporion et avec

ναύσταθμον/naustathmon, deux termes qui, d'autre part, ne sont pas incompatibles, car ils désignent une fonction du λιμήν/limen. Cependant, quelques textes documentent des expressions du type "un ἐμπόριον/emporion et un λιμήν/limen ", ou bien "un λιμήν/limen et un ναύσταθμον/naustathmon". De cette façon les auteurs indiquent la fonction d'une partie du port.

Le λιμήν/limen est très rarement documenté avec les termes αἰγιαλός/aigialos et σάλος/salos. Ceci s'explique parce que ces deux formes d'ancrage sont contraires à l'existence d'un port régulier. Par exemple, Diodorus Siculus, 13.15.3-4, nous documente sur l'expédition à Sicile, quand les trirèmes ont été éparpillées contre l'αἰγιαλός/aigialos et contre le λιμήν/limen. Les deux localisations sont vues comme un continuum, existant l'une à côté de l'autre, mais différentes l'une de l'autre: la plage opposée à les installations portuaires.

Au contraire, le σάλος/salos est l'absence du λιμήν/limen. Par exemple, Polybius 1.53.10 explique que les bateaux doivent jeter l'ancre au σάλος/salos parce que la côte est ἀλίμενος/alimenos. En ce sens, il est curieux que le *Stadiasme* 126 nomme Utique comme σάλος/salos et pas comme λιμήν/limen. Pourtant, il est assez difficile d'étudier le site d'Utique, parce qu'aujourd'hui le site est comblé et en terre ferme à cause des sédiments du fleuve Medjerda.

Il est rare que les termes autres que λιμήν/limen apparaissent en connexion les uns avec les autres. Par exemple, si le σάλος/salos est l'absence du λιμήν/limen, le terme σάλος/salos exclut aussi ce que nous pourrions nommer les "fonctions" du λιμήν/limen, c'est-à-dire, ἐπίνειον/epineion, ἐμπόριον/emporion, ναύσταθμον/naustathmon, mais aussi le ὅρμος/hormos et l'αἰγιαλός/aigialos, parce que ces deux formes portuaires impliquent le point de contact de la mer avec la terre (le σάλος/salos étant l'ancrage à mer ouverte).

Le même cas est valable pour l'αἰγιαλός/aigialos. Ce terme n'apparaît jamais en contact avec ἐπίνειον/epineion ou ναύσταθμον/naustathmon, parce qu'il signifie le manque d'infrastructure. Par la même raison, l'αἰγιαλός/aigialos n'est pas associé à l'ἐμπόριον/emporion, au moins dans la période sélectionnée pour cette thèse (3ème siècle avant Jésus-Christ - 5ème siècle après Jésus-Christ). Cependant, nous ne pouvons pas rejeter l'idée que dans une période plus ancienne, quand ni l'organisation sociale ni les

techniques de construction (par exemple de môles) n'étaient pas trop avancés, le commerce ait eu lieu directement sur le rivage de la mer, sur l'αἰγιαλός/aigialos.

Dans les sources que nous avons étudiées, l'αἰγιαλός/aigialos apparaît en conjonction avec le ὕφορμος/hyphormos chez Strabon, 14.1.35, texte qui ressemble fort à un périple. De cette façon, le ὕφορμος/hyphormos semble représenter plutôt une fonction adjective, en exprimant la qualité de l'αἰγιαλός/aigialos, possiblement pour désigner que la côte peut s'utiliser comme un ancrage de qualité secondaire. Il ne reste pas clair en relation à quoi se donne cette qualité d'ancrage secondaire. Certes, la ville mentionné près de ce passage, Phanae, est décrite comme un λιμὴν βαθύς / limen bathys, ce qui suggère que les ὕφορμοι/hyphormos αἰγιαλοί/ hyphormoi aigialoi (cette phrase est mentionnée deux fois) seraient un lieu pour y venir en cas d'urgence. Malheureusement, il est difficile de démontrer cette hypothèse parce qu'aucun des lieux qualifiés de ὕφορμος/hyphormos αἰγιαλός/aigialos n'a été identifié sur le terrain.

Logiquement, le couple du ναύσταθμον/naustathmon avec ἐμπόριον/emporion n'apparait jamais pour désigner le même port. Effectivement, l'un est le port militaire, l'autre est le port de commerce. Le ναύσταθμον/naustathmon en conjonction avec l'ἐπίνειον/epineion n'apparaît qu'une fois en toute la littérature analysée pour cette thèse, concrètement chez Strabon 8.5.2 en référence à Gytheion. Finalement, aucune cooccurrence du ναύσταθμον/naustathmon avec le ὅρμος/hormos n'a été trouvée. A priori, nous pourrions croire que ces deux termes ne sont pas incompatibles, particulièrement si le ὅρμος/hormos était situé dans une zone d'importance stratégique pour le contrôle militaire ou bien pour la lutte contre la piraterie. Il est possible que les données pour les ancrages plus petits ou de moindre importance ne soient conservées dans le corpus littéraire, ou bien que le ναύσταθμον/naustathmon soit seulement valide pour les ports de grande taille, où l'armée pourrait aussi y avoir ses quartiers.

L'ἐμπόριον/emporion coexiste avec le ὅρμος/hormos et avec l'ἐπίνειον/epineion. Ces termes ne sont pas exclusifs l'un de l'autre. Un bon exemple de leur compatibilité se trouve hors de la Méditerranée, dans le *Périple de la Mer Rouge*, 24: Mouza est décrite comme un ἐμπόριον ἀλίμενος/emporion alimenos mais εὔσαλος/eusalos et εὔορμος/euormos, avec des ἀγκυροβόλια/ankyrobolia de sable. Nous verrons aussi dans le cas d'étude italien un ἐπίνειον/epineion nommé ἐμπόριον/emporion. En plus de ces cas, Procope, *les édifices*, 5.9.38 documente un autre ἐπίνειον/epineion nomé ἐμπόριον/emporion.

Finalement, la relation entre le ὅρμος/hormos et l'ἐπίνειον/epineion est illustrée par Pausanias, 6.26.4. Ce texte décrit Cyllene comme un bon ancrage (ὅρμος/hormos) pour les bateaux, mais aussi comme l'ἐπίνειον/epineion d'Elis, éloigné de 120 stadia.

Il n'y a pas beaucoup à dire sur l'interaction des termes latins les uns avec les autres. C'est un cliché que les Romains étaient des navigateurs moins habiles que les grecs, mais il est vrai que leur vocabulaire sur la terminologie portuaire est vraiment plus réduit. En général, la littérature latine semble conserver le mot *portus* comme port régulier, et tout ce qui n'est pas un endroit avec des installations portuaires est qualifié autrement, notamment *statio* et *litus*. Cette relation est plus bien illustrée par Cicéron, *lettres à ses amis*, 12.15.2; Tite Live, 27.30; César, *Guerre Civile*, 3.6-8 et 3.73.

En ce qui concerne la compatibilité du vocabulaire grec et latin, il faut dire qu'il est difficile de comparer la terminologie de deux langues qui ne correspondent pas exactement l'une à l'autre. En plus, souvent l'application d'un terme ou d'un autre dépend de la perception subjective de chaque personne, comme Labov (1972) l'avait déjà démontré. Cependant, on peut récapituler de la façon suivante.

Le λιμήν/limen correspond au *portus*. Toutes les autres catégories portuaires existent comme variations du λιμήν/limen ou du *portus*. Les deux noms produisent des adjectifs en chaque langue, mais l'équivalence de ces adjectifs εὐλίμενος/eulimenos et *portuosus*, est moins claire. Le premier désigne la bonne qualité de la côte, formé sur le préfixe ευ-. Par contre, *portuosus* est formé avec un suffixe qui indique la quantité. Un cas semblable est celui des antonymes, ἀλίμενος/alimenos et *importuosus*.

Quand on considère le ὅρμος/hormos comme un ancrage plein, et pas seulement comme le point d'attachement en terre pour les bateaux, il est difficile de trouver un équivalent latin. Principalement, le souci est qu'en latin il n'y a pas des sources d'une structure semblable. On pourrait soutenir que la distinction dans l'*Itinéraire Maritime d'Antonin* entre les *portus* et les *positiones* serait comparable à celle des périples grecs entre les λιμέμνες/limenes et les ὅρμοι/hormoi, mais le terme *positio* signifiant une forme portuaire n'est pas documenté par ailleurs. On pourrait aussi penser à la *statio*, mais ce terme implique une notion de temporalité, qu'il est difficile de voir chez les sources grecques. On se demanderait, enfin, si peut-être le ὅρμος/hormos serait l'équivalent d'un petit

λιμήν/limen, et en ce cas, si l'équivalent latin pourrait aussi être le *portus*. Comme nous avons dit, la comparaison entre les langues latine et grecque est fort difficile.

L'ἐπίνειον/epineion se correspond au *portus*, entant qu'il est un λιμήν/limen contrôlé par une ville éloignée. Il ne semble pas que les Romains voient la catégorie d'ἐπίνειον/epineion comme différente, probablement à cause de leur organisation territoriale: le continuum de l'Empire Romain par opposition au système grec de πολεῖς. Pour cette raison, en latin il n'existe pas de nécessité de créer un terme spécifique avec le signifié de l'ἐπίνειον/epineion. Par exemple, ce qui en grec était l'ἐπίνειον/epineion des Athéniens, en latin est simplement le *portus* des Athéniens (on peut comparer Pausanias 1.1.2 avec Cornelius Nepos, *vie de Thémistocle*, 6.1). La relation de dépendance politique se montre avec l'addition d'un adjectif gentilice, rarement avec le génitif de la ville, c'est-à-dire, le port "des Athéniens" et non le port "d'Athènes", et parfois, aussi, en indiquant la distance de la ville dominante, comme par exemple chez le *Bellum Africum*, 10. Il faut aussi noter le changement de valeur du latin au grec causé par cette manque d'une catégorie spécifique. Par exemple, Pline l'Ancien (*Histoire Naturelle*, 4.3.7) note Cirra sans la mettre en rapport avec Delphes, au contraire de Pausanias, qui considère Cirra toujours comme l'ἐπίνειον/epineion de Delphes (10.1.2, 10.8.8, 10.37.4, 10.37.8).

Le terme *emporium* comme l'équivalent de l'ἐμπόριον/emporion grec s'utilise seulement quand les auteurs s'aperçoivent d'une nécessité de spécifier, ou bien quand ils traduisent des sources grecques. Le terme emprunté *emporium* peut s'observer par exemple chez Vitruve 2.8.11, Tite Live 41.1.3-5, et Pomponius Mela 1.61. Les ports les plus importants, même si leur fonction était principalement commerciale, étaient nommés simplement *portus*. Un autre possible équivalent pour l'*emporium* serait la *statio*, celle-ci désignerait les ports de moindre qualité climatique ou bien morphologique, pour des étages de courte durée. De toute façon, il n'est pas certain que, quand les auteurs latins utilisent le terme *statio*, ils ne voudraient pas mettre plus d'emphase sur le point que les bateaux doivent jeter les ancres à mer ouverte (c'est-à-dire, au σάλος/salos), et en conséquence y faire un stage de courte durée, que sur le fait commercial de l'ἐμπόριον/emporion.

Pour le ναύσταθμον/naustathmon, les équivalents latins peuvent être toujours le *portus* et la *statio*, à moins que ce ne soit un toponyme, Naustathmus. *Statio* semble être le terme préféré quand le contexte est clairement celui d'une invasion militaire ou bien des opérations de la marine, comme par exemple dans le *Bellum Alexandrinum*, 25, où la

marine alexandrine place des bateaux à Canopus pour intercepter des transports qui venaient de la Syrie et de la Cilicie. Pourtant, quand la base militaire au port est bien établie, les auteurs latins parlent de *portus*, comme nous voyons chez Vitruve 2.8.14, quand il décrit Halicarnasse.

Le σάλος/salos peut être adapté comme *salum*, ou bien comme *statio*, ou tout simplement avec la mention que les bateaux ont jeté leurs ancres. À nouveau, le terme hellénisé s'utilise quand les auteurs s'aperçoivent d'une nécessité de précision, ou bien quand ils traduisent des sources en grec. Des exemples de cela se trouvent chez Tite Live 37.16, Pomponius Mela 1.71, et le *Bellum Africum* 62-63. Les textes latins peuvent aussi noter le fait de jeter l'ancre à mer ouverte avec le terme *statio*, mais dans autres occasions la simple expression de jeter l'ancre, par exemple à cause du mauvais temps, est suffisante. Dans ce dernier cas il est un peu douteux que ce soit un σάλος/salos proprement dit, parce que le σάλος/salos, comme la *statio* romaine, se trouve à une proximité relative de la côte. En ce sens il faut comparer Tite Live 29.27 avec le *Bellum Alexandrinum* 9.

Finalement, l'αἰγιαλός/aigialos est le *litus*. Les deux termes désignent la côte ou la plage, et s'utilisent dans des contextes identiques. En ce qui concerne l'ἀγκυροβόλιον/ankyrobolion, il ne semble pas qu'il y ait des données suffisantes pour établir une association avec le vocabulaire latin.

Pendant le cours de notre thèse nous espérons avoir fait deux contributions: premièrement, la clarification du vocabulaire portuaire latin et grec; deuxièmement, un exercice de collaboration efficace entre les deux disciplines de la philologie et l'archéologie. Comme nous en discutons au chapitre de la critique de la littérature publiée jusqu'à present, même quand les deux disciplines sont fort bien complémentaires, elles sont rarement mises en conjonction pour ce qui concerne les ports anciens.

Nous espérons avoir produit une discussion philologique utile entant que nous avons utilisé un vaste corpus littéraire, et aussi nous espérons avoir supporté et enrichi ce travail linguistique avec des données archéologiques tangibles. Nous espérons enfin avoir mis au jour des tentatives antérieures semblables, comme par exemple Finzenhagen (1940) et Rougé (1966), dont les recherches ont été entreprises avec des corpus littéraires substantiellement plus limités. De ce point de vue, les nouvelles technologies, les bases de

données du TLG et du PHI, aussi que la base de données du Projet Portus Limen, ont été d'une grande utilité.

Nous espérons aussi que les commentaires étymologiques ont été particulièrement utiles, parce que, quand les mots sont créés, ils signifient quelque chose de concret dans leurs contextes. Particulièrement dans les cas du ὅρμος/hormos et du σάλος/salos, nous pensons que la recherche étymologique a été d'une grande aide.

Notre contribution au sujet des ports gréco-romains arrive jusqu'ici. Pourtant, nous pensons qu'il y a du bon matériel pour continuer à faire des recherches à l'avenir. Particulièrement, l'*Itinéraire Maritime d'Antonin* est un texte fort intéressant, mais aussi assez compliqué, et qui manque d'attention. La comparaison de cet *Itinéraire* avec les périples grecs, et aussi du travail archéologique et du GIS, pourraient fournir plus de données utiles au propos de les recherches portuaires, car ce texte a été exclu de notre thèse à cause de sa complexité.

Hors du territoire méditerranéen, il serait très utile aussi de faire des recherches sur la Mer Rouge, grâce à son commerce et son périple. Pour la même raison, il serait intéressant de voir les côtes de la Péninsule Arabique, l'Iran, le Pakistan et l'Inde.

Finalement, nous croyons aussi que comme travail pour l'avenir on pourrait faire des recherches sur les manœuvres des bateaux. Par exemple, si un port est nommé comme θερινός ("pour le beau temps"), quelles étaient les difficultés de l'utiliser pendant l'hiver?

En somme, nous espérons donner avec cette thèse une contribution à la clarification de la terminologie portuaire en grec et en latin utilisé en Méditerranée pendant l'âge de l'Empire Romain.

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LIST OF FIGURES

Note:

Unless an external source is specified in the caption, the figures and the maps have been prepared by the author of this thesis.

All translations made by the author of this thesis unless noted differently.

LIST OF ACCOMPANYING MATERIALS

There are no physical accompanying materials to this thesis. However, the data collection is compiled in the databases of the Portus Limen Project. The databases are still not available to the general public. To this effect, a guest account has been created for the purposes of this examination:

1. Go to the following address in your browser: https://data.portuslimen.soton.ac.uk/login

2. Log in with the following details:

User: **guest**   Password: **Portu5Guest**

For the databases related to this research, go to the sections **Ancient sources**, and then **Ancient literature.** In there, you will find the databases related to **Books**, **Passages** and **Words**, created by the author of this thesis. The rest of the databases belong to the other members of the Project.

DECLARATION OF AUTHORSHIP

I, Núria Garcia Casacuberta

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

Limenes. The terminology of the Mediterranean ports of the Roman Empire as documented in the literary sources.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;

3. Where I have consulted the published work of others, this is always clearly attributed;

4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;

5. I have acknowledged all main sources of help;

6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

7. None of this work has been published before submission

Signed:

Date:

ACKNOWLEDGEMENTS

ABBREVIATIONS

Bailly = Bailly, A.; Séchan, L. and Chantraine, P. (2000⁴) *Dictionnaire grec-français*, Paris: Hachette

DGE = *Diccionario Griego − Español*, availabl at: http://dge.cchs.csic.es/

LSJ = Liddell, H. G.; Scott, R.; Jones, J. S. and McKenzie, R. (1996, reprint 9th ed.) *A Greek-English lexicon*, Avon: The Bath Press

OCD = Hornblower, S. and Spawforth, A. (1996³) *Oxford Classical Dictionary*, Oxford: Oxford University Press

PHI = Packard Humanities Institute Latin Corpus: http://latin.packhum.org/

TLG = Thesaurus Linguae Graecae: http://stephanus.tlg.uci.edu/index.php

RE = von Pauly, A. F.; Wissowa, G. et alii (1980) *Paulys Realencyclopädie der classischen Altertumswissenschaft*, Munich: Druckenmüller

cf. = confer, compare, it refers to further bibliography

ss. = sequentes, it refers to the pages / entries / items that follow the indicated reference

s.v. = sub voce, it refers to the entry of a word or lemma in a dictionary or encyclopaedia.

1. INTRODUCTION

"An ancient contest was held at Delphi for players of the cithara to sing a paean in honour of the god. (…) Timosthenes, the admiral of the second Ptolemy who wrote a Treatise on the Ports in ten books, composed a song", reports Strabo.[1] Sadly, nowadays we cannot help but wonder about the contents of the works by Timosthenes and others like him. Indeed, the portolan of Timosthenes, as well as many other handbooks on harbours, survived only in excerpts, if at all[2]. Some of these works were certainly sailing itineraries of the style of the *Stadiasmus*, and could provide valuable insights into the trade routes of his age.[3] But perhaps other works were – or maybe included – guidance on what facilities to expect from each port. Certainly it cannot have been the same to arrive at a λιμήν/limen or at a σάλος/salos?

This thesis forms part of the Portus Limen Project (www.portuslimen.eu, ERC Grant Agreement no. 339123). The aim of the project is to research the networks of Mediterranean ports of the Roman Empire. Within this project, my research focuses on the literary sources that have been preserved from antiquity. The main research question can be summarised as: what information can ancient literature provide on the types of ports active during the Roman Empire? This will be examined with the focus on the different words relating to ports. Ancient Greek has many terms that refer to some form of port or anchorage (see section 4), whereas Latin has mainly two, namely *portus* and *statio*, sporadically also *litus*. What can literary sources tell us about those? Do these words always have the same value? Through this thesis I hope to provide answers on the port terminology of the classical languages and their ontologies – i.e. the pragmatic contexts in

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[1] Strabo, 9.3.10: Ἀγὼν δὲ ὁ μὲν ἀρχαῖος ἐν Δελφοῖς κιθαρῳδῶν ἐγενήθη παιᾶνα ᾀδόντων εἰς τὸν θεόν· […] ἐμελοποίησε μὲν οὖν Τιμοσθένης, ὁ ναύαρχος τοῦ δευτέρου Πτολεμαίου ὁ καὶ τοὺς λιμένας συντάξας ἐν δέκα βίβλοις.

[2] The earliest treatise on ports that we know of was that written by Philo of Byzantium, a Greek engineer of the 3rd century BC. His treatise is lost. By contrast, some fragments from the portolan of Timosthenes survive, see Wachsmuth (1904) and Prontera (2013) for discussion.

[3] The edition currently in use of the *Stadiasmus* is that by Müller (1855), but Müller's edition is highly manipulated. There are a couple of critical commentaries worth noting, those by Cuntz (1905) and Helm (1929). However, those commentaries are very impractical to work with. Because of this, the edition by Müller has been taken as the basis of this work, as it is the one available at TLG. This edition has been compared against the critical apparatus provided by Cuntz, and alterations have been made where relevant to provide a text that is more accordingly to that of the manuscript.

which these words are used. Through an analysis of the sources, I hope to provide an account of what coastal features each anchorage form implied.

Indeed, what we understand as geography today was first written in the Greek cultural world by authors like Herodotus.[4] However, the main impulse to geographical writings in the sense of land-descriptions appears in the form of sailing guides, so to speak, drawn from an individual's personal experience.[5] Sailors and explorers would record their routes in writing. These texts are nowadays known as *periploi* ('circumnavigations'). They contain usually very succinct paragraphs detailing the succession of ports in chronological-spatial order, as one would sail along the route. The texts also describe facilities that are available at these ports, such as drinking water, or elements of the landscape that may help the crew to gain sense of orientation or to approach the coast.[6] However, due to the kind of information that they contain, it is possible that these guides were used also by (or mainly by) workers on land, such as those in charge of sending the cargoes, in order to value what was the risk of it.[7] Some of these descriptions, like that of the Pseudo-Scylax (dating back to the 4th century BC) include brief notes on other topics, such as the ethnic populations of the place. However, the periploi-guides that have been preserved are those with a practical function, i.e. those recording trading routes.[8]

It was texts of this nature, and especially those written by voyagers and curious scholars like Artemidorus and Eratosthenes, which form the base material for authors of what we would more commonly identify as geography. The term *geography* means literally 'description of the land', and it was aimed at describing the dimensions and shape of the various territories, as well as the absolute position of places, and to record the peculiarities of its inhabitants.[9] This is precisely what authors like Strabo or Pausanias (the latter in fact, a *periegetes*, "guide") did. Although each author has a specific purpose for their text, their

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[4] Niebuhr, 1830. Arguably, the Presocratic philosophers could be considered geographers inasmuch as some of their investigations observed physical or natural phenomena, but those need not concern us for the purposes of this thesis.

[5] Kowalski (2012).

[6] For discussion on the periploi, see Medas (2011), Arnaud (2010b) and Arnaud (2012).

[7] This practice is arguably traceable down to the medieval portulans. For the Greek portulans: Delatte (1947).

[8] Apart from Pseudo-Scylax, the other notable text that has been consulted for this thesis is the *Stadiasmus Maris Magni or Periplus of the Great Sea*, which focuses on the Mediterranean. Other guides, which have only been taken into account where relevant, include the *Periplus of the Black Sea* and the *Periplus of the Red Sea*. The two other extant periploi are that of Hanno, a Carthaginian colonist, and the one attributed to Scymnus. Other periploi are attested, but those have not survived to our days.

[9] Cf. Pontrera (1983).

narratives list the monuments that are present at each site (a temple, a theatre, a town, a port…) and their importance in their ethnic, historical, cultural and, above all, political contexts. This 'usefulness' of geographical research is stated by Strabo in 1.1.16.[10] In this sense, for example, Strabo makes a veiled eulogy of the Romans when he describes the harbour at Ephesus in order to make it clear that it is not functional, hinting that the problems are due to it not being built by Roman engineers.[11] However, the ancient authors had not always visited the places in person: in fact, the majority of the times they have not. Most geographers make use of lost pre-existent sources (like those mentioned just above) with an undesired high frequency.[12]

Together with the geography, a large bulk of information comes from the historians (I am including in this group the writers of lives). Originally, the word *history* meant 'research, inquiry',[13] and although its focus is centred on recording events of humanity, quite often historians need to describe the characteristics of the land or town where these events occurred, along with the ethnographic traits of the peoples involved.[14] Diodorus Siculus, for instance, opens his work with recollections of Egypt, and then goes on to describe the foreign nations of Mesopotamia, India and the regions leading to it, and Ethiopia, before reaching again the "known" space of the Mediterranean Sea.[15] The authors writing about the Punic Wars, like Polybius or Appian, are often forced to describe the specific features of the places (e.g. the ports of Lilybaeum or Carthage),[16] because those will determine military strategy, in other words: that the army takes positions in such or such manner. In

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[10] Cf. Pontrera (1983).

[11] Strabo, 14.1.24.

[12] See the Methodology section for the issues with lost literature and lack of autopsy on the side of the preserved texts.

[13] LSJ, s. v. ἱστορία: «*inquiry … systematic or scientific observation … knowledge so obtained, information … written account of one's inquiries, narrative, history*»; cf. Bailly, s.v. ἱστορία «*recherche, information, exploration … résultat d'une information, connaissance … relation verbale ou écrite de ce qu'on a appris, récit … histoire*». The word also applies to some geographical writings during the Roman Empire, down to the Byzantine period.

[14] This occurs at very different levels, though. Polybius, like Thucydides before him or Amminaus later on, thinks that the full description of places is necessary for the understanding of history. For that reason, Polybius is also a geographer, and whether he had written a geography or just a sum of geographical digressions is still a discussed issue. Livy, on the contrary, contents himself with mentioning just the necessary details. This makes the structure and value of their accounts entirely different.

[15] Diodorus Siculus, *Bibliotheca Historica*. On Egypt, book 1; Mesopotamia, 2.1-34; India, Scythia, Arabia and the islands of the Ocean, 2.35-60; Ethiopia and the gold mines of Egypt, 3.1-14; the coasts of the Arabian Gulf, 3.35-61. The following books (3.61-74 to 40) relate landscapes and events of the Mediterranean geographical area with a brief incursion to Britain in book 5 and Alexander's campaigns in book 17.

[16] E. g. Polybius on Lilybaeum: 1.42 ss., cf. Diodorus Siculus, 24.1; Appian on Carthage: *Punic Wars*, 14.95-100.

conclusion, geography started as an aid in recording foreign territories, before becoming a genre by itself. Descriptions of places are, however, found also elsewhere in the reality-based literature,[17] especially in historiography.[18]

The reader may wonder about the contribution of this thesis in combining of texts and archaeology. This thesis represents mainly a lexicological study, an ontological compilation of the characteristics of each port form in itself and in relation to the others. However, with the choice of case studies, and therefore by crossing the literary with the archaeological data, I hope I can shed some light on the subject of how the theoretical approach functioned in reality. For example, the customs-office, which seems an obvious facility in commercial ports, is only very rarely attested in the literature. Nevertheless, at least two such structures are documented in Alexandria (namely the nearby sites of Schedia and Taposiris Magna, where merchandise would be stopped before reaching the city by means of the canals).[19] The second case study, the southernmost part of Italy, focuses on port networks and their effective functioning. In other words, how connections between larger port units and smaller port units were articulated, and how one harbour could benefit from or produce a benefit to the others with which it was related (see 5.2, esp. Tarentum). Also, the comparison with physical remains throughout the thesis can help solve some issues caused by the written sources.

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[17] Naturally, descriptions of places are also found in fictional literature. Fiction literature should, however, be consulted only as support evidence because the places dealt with are likely not to have been real or to have been artistically modified by the author. Yet their consultation is still useful inasmuch as fiction provides conceptual ideas of ports. See, for example, Lucian's *True Stories*. Myths, like the poem of the *Argonauts* by Apollonius of Rhodes and novels, such as *Callirhoe*, also offer some information. In the Latin sphere, details are not so rich, but authors such as Apuleius, Petronius or Plautus offer some data on the subject of ports. Sadly the same lack of reference to reality can be made of some historical texts. Let us not forget that, for Roman civilisation, history is a didactic genre, rather than an informative one, and the focus of the text will lie in the actions, rather than on where they happened, which may lead to gaps or inconsistencies. Therefore, caution cannot be excluded in the examination of any textual piece.

[18] These descriptions are mostly based in military accounts, such as Caesar's commentaries. Especially relevant for this thesis is the pseudo-Caesarean *Bellum Alexandrinum*, especially §§ 42-47. However, generally speaking, authors do not provide topographical details beyond the strictly necessary ("this happened in that place") and only elaborate if the physical context of the event requires so. Therefore, a lot of inference and double-checking with other sources is necessary. Other reality-based literature are technical treatises, such as Vitruvius's *De Architectura*, but that does not guarantee that the ports described will be real ones, rather than idealised places. See Vitruvius, 5.12.1-7.

[19] Empereur, 1998: 225. The book states, in fact, that an American expedition uncovered an administrative building on the site, but it does not say which expedition or campaign. Because of this, I have not been able to find or access any excavation reports about this building.

To sum up, I hope that the questions left unsolved by the literary data (or lack of) can be answered by means of the comparison with specific sites. Similarly, a particular look at these significant hubs should provide confirmation of the hypotheses in the discussion. I would also like to point out that I will not be providing new archaeological data of my own: every archaeological detail adduced in this work has been collected from published sources. I believe, too, that the gathering of all the relevant information that is now dispersed in different volumes will be useful.

The research in this thesis will be structured around the following two main research themes, followed by two case-studies in which some of the emergent issues are looked at in more detail in the context of archaeological sites.

1.1 The lexicographical analysis

The first part of this research is devoted to the terminology in singular contexts. Several words are attested in Greek in order to indicate places where ships can moor: ἐπίνειον/epineion, λιμήν/limen, σάλος/salos, ἀγκυροβόλιον/ankyrobolion … I shall discuss some basic linguistic concepts later, but for the moment, be it sufficient to say that total synonymy does not exist. If we are left with that many words, there must be (or rather must have been) some kind of difference in the semantic space covered by each term, so that the speakers perceived that an ὅρμος/hormos, for instance, is not the same as an αἰγιαλός/aigialos.

And still, one might expect that dictionaries have a precise equivalent for each of these words, which is sadly not the case. If we check *LSJ*, the widest-used ancient Greek to English dictionary, we can find some incoherences. For example, if we look up the word ἐπίνειον/epineion, its definition is «*the sea-port where the navy lies, state harbour*». This completely overlooks the civilian (commercial) function so frequently associated with this word.[20] When we look up the word λιμήν/limen, we read that it is a «*harbour, haven, creek, whereas ὅρμος is properly the inner part of the harbour*». This leaves us with two problems: firstly, that the so-called "inner part of the harbour" is not there when we look

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[20] Just to quote an obvious example, see Dionysius of Halicarnassus, 9.56.5: ἐν δὲ τούτῳ ἥ τε γῆ αὐτῶν ἡ πολλὴ ἐτμήθη, καὶ πολίχνη τις ἐπιθαλάττιος ἑάλω, ᾗ ἐπινείῳ τε καὶ ἀγορᾷ τῶν εἰς τὸν βίον ἀναγκαίων ἐχρῶντο, "*in the meantime they ravaged most of their land, and they captured a village by the sea, which they used as an* epineion *and a market for their everyday needs*".

up the entry for ὅρμος/hormos (whose primary meaning refers to a collar), since ὅρμος/hormos is defined as a «*roadstead, anchorage, mooring*». Secondly, the fact that in the written sources that have come down to us, λιμήν/limen is usually not associated with ὅρμος/hormos, but with σάλος/salos,[21] generally in order to indicate that there is no λιμήν/limen in a specific place, but there is a σάλος/salos for ships to moor in. Moreover, when we look up σάλος/salos, it is explained as «*any unsteady tossing motion*» and hence, «*a tossing on the sea*». This is the only maritime reference we can find, regardless of all the sources indicating that ships *can* drop anchor in σάλοι/saloi. By this, I do not wish to say that *LSJ* is wrong. It is extremely difficult for a dictionary, however good, to record every single meaning and instance of usage accurately, and it is perfectly logical that it only provides broad, basic guidelines that each scholar must understand in context.[22]

Let us speak now about the words in context. When we rely on translations of specific terms, a similar problem occurs. Let us check, for example, some passages mentioning ἐπίνεια/epineion in Strabo's ninth book of his *Geography* edited and translated by Jones (1924). This very same word is translated in different ways, such as «*naval station*» (9.1.4), «*seaport*» (9.4.2) and «*naval arsenal*» (9.5.15). All of these still disregard the commercial function attested by Strabo himself (e.g. 3.2.6, 4.1.12) and elsewhere (e.g. the *Suda*, Dionysius of Halicarnassus). Similarly, even if *seaport* and *naval station* might serve as equivalents, the phrase *naval arsenal* adds clear military connotations that the others do not have, something that may be confusing as to the use of harbour facilities named by the Greek word ἐπίνειον/epineion. Again, it is not my intention to criticise Jones's exquisite translation of Strabo. I am only making use of these examples in order to illustrate the issues that led to the genesis of this thesis.

I would also like to make it clear that in my research I shall not produce word-to-word dictionary-like translations, but rather *explanations* of what each port category involves, and by investigating the associated ontological uses, I hope that I can unravel how the words are applied in each context. My decision not to translate the terms researched is because languages do not offer exact correspondences with one another (cf. the Catalan words *capsa, caixa* or the Spanish *pez, pescado*, which are respectively "only" *box* and *fish*

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[21] Cf. Diodorus Siculus, 3.44.4 or *Stadiasmus*, 9 and 126.

[22] It was not feasible to use a more modern publication like the *DGE* in all cases because that work is still in progress. *LSJ* was first published in 1843, but it has had some updates since.

in English, or English *entrance* being *Eingang* or *Einfahrt* in German).[23] Also, since archaeological and geomorphological evidence will be taken into account during my research, it is more reasonable to provide complete definitions with case-study examples rather than one-word rough equivalents, the problems of which have just been demonstrated.

In addressing the theme, I have considered modern research and other relevant points, and structured the research around four questions:

> ➢ How can an etymological approach contribute to our understanding of this word?
> ➢ What are the ancient definitions of the term?
> ➢ General features: what are the essential requirements for a place to meet the definition of the term?
> ➢ What extra information can we find in the texts? What is missing?

The addition of an etymological approach is, in fact, rather new in this research field. Some of the words have already been researched in etymological compilations.[24] However, during my study I hope that the origin of the words and their evolution will contribute to the clarification or precision of the term, integrating and further confirming the data from the contexts of the literary passages. I also hope to produce more detailed comments than those of the etymological dictionaries and publications available to this day, as they are usually too concise. The etymological approach as a solid heuristic tool has also been advocated by Clarke (2005), as it allows for research within the original language, without having to depend on schemes from another, modern language.

1.2 The case studies

Two case studies have been selected to expand what written sources can tell us about ancient ports and to explore how far the theoretical approach adopted in addressing the foregoing issues is valid. The sites chosen are Alexandria and the area corresponding to Puglia-Basilicata-Calabria. Alexandria has been chosen as an active trading-port, the latter

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[23] Cat. *caixa* is the general word for *box*, with the broader meaning distribution; whereas a *capsa* is rather small and made of a thinner material such as cardboard or tin. Span. *pez* is a fish in the sea, whereas a *pescado* is the animal literally after it has been fished, i.e., as food. Ger. *Eingang* is an entrance used by people when walking, whereas you drive through an *Einfahrt*.

[24] Most notably, Finzenhagen (1939). Dictionaries, like Pokorny's (1959), are also of general interest.

instead represents a good example of the establishment of port networks. Indeed, one of the main observations within the Portus Limen Project was that ports were not isolated units, but connection hubs. While ports of larger cities were able to accommodate larger volumes of traffic, those ports also had connections with smaller sites, that could offer them political and commercial advantages (e.g. territorial control, tax, redistribution of goods), and complement them geophysically in the form of fore-stations, for example for ships to stay in adverse weather. Archaeological means contribute to the recording and conservation of the tangible remains of naval traffic, while the literary methods offer an interesting and explicit approach to the dependence relationships between the sites.

The case-study sites have been selected on account of the abundance of archaeological data, as physical remains will help provide further and different kinds of information than the texts. Furthermore, we have enough descriptions from antiquity in reliable sources, which is another reason why these specific sites have been chosen. For Alexandria, there is the description of Strabo, an eyewitness who saw the city (and its port) for himself, as he lived there for a period of time.[25] As for the second case, abundant details can be found in Strabo, Pliny, and other Classical authors. The archaeological studies available for these sites are both abundant and accessible, which greatly facilitated my task.

There are a number of challenges when trying to reconcile archaeology with literature. First, though, it is mandatory to make sure that the literary descriptions are reliable, i.e. that they belong to people who saw the sites in person or received unequivocal reports of them. Thus, if the literature is questionable in the first place, it will be very difficult, if not impossible, to establish positive correspondances with the realities on site.

Another issue is that the excavations at the relevant sites are incomplete, therefore, their full extent is unknown. And still some structures may be missing because they were made of perishable materials, or else the construction materials were re-used in later periods. A number of institutions are still carrying out excavations in Alexandria, especially rescue excavations (see esp. Empereur, 1998 : 19-34). Similarly, research on some of the Italian sites is rather old (most of the works refer to the surveys by Paolo Orsi in the 1920's), and I hope more data will be forthcoming in the near future. In addition, the nature of textual data is quite different from that of the archaeological evidence. It was different circumstances that conditioned the survival or loss of materials, and the process of

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[25] Estimated ca. 30-25 BC, as he was accompanying the Prefect of Egypt, Aelius Gallus.

interpretation of the preserved structures and artefacts is quite different from the reading and exegesis of texts[26].

Nevertheless, literary records are also sometimes incomplete. Even when the records are trustworthy, they do not tell us everything. Especially in the case of historical accounts (including biographies and letters), texts relate events that took place, rather than the characteristics of the place itself. The *Bellum Alexandrinum*, 17, for instance, informs us that Caesar realised the need to control the Island of Pharos and the Heptastadium, so the enemies were forced to retreat, disembark and defend the buildings on the shore. But what were these buildings that it was so essential to defend? Were they government buildings, workshops, armouries, houses? This the text does not say. Both literature and archaeology are in their ways incomplete, and it is the combination of both what I hope will contribute to a fuller picture.

1.3 The integrated approach

After the presentation of the available data, I would like to discuss how terms relate to one another. In other words, I shall research the ontology of harbour vocabulary, or why words are used in the ways and contexts where they are employed. During my research, I have found terms used in combination in the same passage, as well as different passages relating to the same place but using different terms. Therefore, for the discussion, I would like to investigate whether the use of the vocabulary on the part of the ancient authors is consistent.

Language relies on abstracts, mental ideas of "minimum conditions" that must apply in order to name objects and concepts by one label or another (see the discussion below in the literature review). Ancient scholars, as speakers of Greek and Latin as still living languages, should be able to use harbour terms (or any other technical words for the matter) with the flawless precision of a native speaker. But do native speakers always speak with "flawless precision"? How sure can we be that they were aware of the nuances between the different types of anchorage, especially when authors were compiling or re-writing rather than producing work of their own? Can we explain the reason why different authors would refer to the same place by different terms? Or else, when two terms concur in the same

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[26] For discussion, I refer to Johnson (2010[2]).

passage, can we understand why? These are the questions that I will try to answer in the discussion.

To sum up, the aim of this thesis is the description of ancient harbour terminology from the Greek and Roman texts in the original languages and in comparison with extant physical remains. As I shall explain in the literature review, the main flaw of the research up to date is that it only takes into account either the linguistics or the archaeology, so that one set of data is not compared with the other as a potential source for further confirmation of the hypotheses or denial thereof, or for filling gaps in our knowledge.

Following the literature review (chapter 2), I will explain the methodology that I have applied in chapter 3. Subsequently, I will display all the data resulting for the literary collection that I have carried out for each term (chapter 4), followed by the case-studies (chapter 5). The implications of both datasets are brought together in the discussion in chapter 6. Finally, some concluding words and suggestions for future work are provided in chapter 7.

2. LITERATURE REVIEW

2.1 Preliminary observations

In this chapter, I will review the research that has been done up to date. Because my investigation is highly specific (the semantic scope of ancient Greek and Latin harbour terminology), there is not one work or set of works that I can refer to. Instead, it was necessary to consult research in two main fields: linguistics and archaeology.

The necessary first step in order to undertake this research was to extensively consult modern bibliography on the subject, which provided me with a state of the question as well as the terminology that was relevant to research. The modern publications are discussed in this chapter, ancient works will be detailed in chapter 3. I would also like to make it clear that this is not an exhaustive review of all the published research possible. Due to the constraints of a doctoral thesis, a selection had to be made, and I will present only the research that can make qualitative contributions in one aspect or another of my own investigations.[27] Similarly, the reader may wonder how the materials revealed fit in the field of study. However, I would like to emphasise that, apart from very few papers (Ardaillon, Finzenhagen, Rougé), my approach to the topic is unique and has been created ex professo for the research in this thesis. Therefore the literature does not represent the evolution of a field of study as such, as my research question is new, but instead it covers the different areas of contribution in addressing one aspect or another raised by my research.

The aim of this thesis is to investigate the linguistic implications of the words in ancient Greek and Latin that designate a form of port or anchorage. These words will be described by themselves (semantic traits) and when they appear in an organised discourse (pragmatic approach). In order to do this, it was necessary for me to find referential bibliography in these two fields. First of all, the field of general linguistics, and more precisely semantics and pragmatics, in order to establish a procedure for dealing with the ancient texts, which are my source of information. Secondly, bibliography on ancient ports needed to be

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[27] Especially in the case of the Greek term λιμήν, the materials available were so vast that it was necessary to be stricter in the choice.

considered, in order to provide fruitful comparisons to elucidate my theoretical approaches, and also to fill any gaps in areas where textual evidence is patchy. Thus, I will first review some essential linguistic concepts, next I will discuss the works on the subject of ancient harbours.

2.2 The linguistic aspect

2.2.1 Qualitatively informed quantitative analysis

First of all, though, I would like to point out to a main problem: that semantics and pragmatics are mostly studied from the perspective of two people having a conversation in a present-day living language, which is clearly not the case in this thesis. To begin with, my materials are written, not spoken – therefore most of the issues that modern linguists take into account, like tone of voice or context of the speech act, will not apply. But, most importantly, we are not going to get any feedback from the ancient writers themselves, thus turning their discourse into a one-way monologue that we can only contemplate. It is a great handicap for this thesis that most of the studies on ancient languages are not focused on general semantics investigation, whereas works on semantics and pragmatics (see below) do not seem to be applicable to situations other than live conversational interactions. Neither discipline incorporates the other field as a potential heuristic or theoretical framework.

Discourse analysis for languages that are no longer spoken by native speakers, like Latin and ancient Greek, is only possible thanks to written texts. Nowadays, thanks to the possibilities offered by technology, in particular the *TLG* and *PHI* corpora, scholars no longer have to rely on their memory, personal experience of reading particular texts, or whatever editions they can get hold of. This allows for a holistic approach to each subject, making sure that no vital information is lost along the way simply because the researcher had not come across it. This same observation is shared by Bubenhofer and Scharloth (2013), who make other important points.

Firstly, they argue, a discourse is not necessarily represented by the analysis of a number of texts. Secondly, a discourse is multi-modal and not restricted to the written medium. Thirdly, corpus linguistics works by researching statistical frequencies, or the number of times that a given expression appears; but this does not mean necessarily that what is relevant will also be repeated frequently – it could just be taken for granted and left unsaid.

These issues may be corrected for presently spoken languages, for example by widening the scope of the dataset, but in the case of ancient Greek and Latin, we will have to content ourselves with the close approximation furnished by the surviving literature.

Corpus Linguistics, which is the analysis of the elements of the language in a given collection of speakers or texts, operates by searching for N-Grams. N-Grams can be anything that the scholar wishes to find, from a certain kind of suffixes (e.g. *–ese*, as in *Burmese* or *Maltese*) to full phrases (e.g. *to put all your eggs in one basket*). Corpus Linguistics, according to Bubenhofer and Scharloth, contributes to the gathering of evidence for two main purposes: to either prove a hypothesis or to find the elements to formulate one. Here I shall perform a corpus-based analysis with the latter purpose, in order to achieve a definition for each anchorage form in Latin and Greek as far as the evidence will allow. In fact, Corpus Linguistics particularly suits this purpose, and the main example provided by Bubenhofer and Scharloth themselves is a dictionary-like investigation. The other two examples provided in the paper, involving word clouds and mapping of regional variations, are not relevant for this thesis.

In the conclusion of their paper, the two authors warn that, although quantitative analysis has been extremely unappreciated, it is worth taking it into notice, and in particular they advocate for a «quantitatively informed qualitative analysis». This phrase, I believe, is a good method to work with.

2.2.2 Saussure and the origins of linguistics

Reflection on language aspects, at least in the Western culture, has been taking place since earliest times, with greater impulse since the foundation of the great libraries like those at Alexandria and Pergamon, which became focal centres of scholarly activity.[28] However, the first great theorist who viewed language as an abstract system governed by rules was Ferdinand de Saussure. Saussure gave a series of lectures at the University of Geneva in 1906-1907 and 1910-1911, which are considered the foundational milestone of linguistics as the science of language studies. He never published his work. Instead his students compiled their notes on the course and published them in the professor's name under the title of *Course de Linguistique Générale* (1916).[29] Linguistics studies have advanced

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[28] I would like to point that this is not a thesis on the origins of language. For an introduction to this aspect, see Fitch (2010) and Fitch et al. (2012).

[29] For commodity reasons, I shall adhere to the convention of referring to this work as Saussure's.

considerably and many parts of the *Course* are nowadays out of date. However, a few basic concepts are still valid, and it will be useful to remind ourselves of them before advancing further.

Saussure stresses that the linguist cannot afford to disregard written texts, for they are the only means of obtaining knowledge with languages from distant times and places. Saussure also highlights the very close connotations that linguistics has with other disciplines like prehistory.[30] He then exposes his theory of communication, which only takes into account oral verbal communication and only the physical interactions between emitter and the receiver (unaware, for instance, of canal or context). This is a constant through the book: references to written or non-verbal communication are scarce. Oral communication also involves the possibility of providing feedback, something which is not possible in the case of my materials.

One point that Saussure first called attention to are the constituents of language. The most basic element is the sign, which in turn is a dual combination between the significate (*signifié*) and the signifier (*signifiant*). In other words, the linguistic sign has a double nature, it is composed by a phonic or graphic chain[31] which refers to an object or concept in the real world. The ensemble of all the signs forms the system of a language. But the signs, and therefore the language, are arbitrary. Saussure formulated language as an abstract system which is not related by any visible or natural ties to the physical realities it designates. Proof of this is the existence of multiple languages. If there was a relationship between the sign and the reality that it designates, all speakers would be referring to the same reality by the same word. If there was an objective reason to designate things with one name or another, the animal that in English is called a *fish* would not be named *poisson* in French, or *peix* in Catalan, or *arrain* in Basque, or *ψάρι* in modern Greek. Saussure proposes two binary components of a sign, the signifier and the significate, as shown in Figure 1:

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[30] Wencel (2011) presents an excellent overview in his short paper.

[31] Saussure speaks of "sound patterns". In modern terminology, by "sound pattern" we must understand phonology (i.e. the mental ideal of what words should sound like) rather than phonetics (what we are able to articulate in each circumstance). He also gives little or no consideration to the written sign.

thing / concept (significate)	
sound pattern (signifier)	ʃɪp

Figure 1. Constituents of the linguistic sign: significate and signifier.

Therefore, language (*langue*) can be defined as the arbitrary system of signs that a more or less extensive community of people makes use of. To this definition I would add that also the rules by which these signs can or cannot combine constitute the abstract system of language. Speech (*parôle*), on the other hand, refers to each individual, ephemeral communication act. Saussure only seems to give some acknowledgement to written forms inasmuch as they can record language varieties that no longer exist. He clearly states that spoken or written languages have two different sets of symbols (sounds or letters), but the second only exists to represent the first. Such a simplistic statement is shocking considering that Saussure himself mentions explicitly that there are two kinds of writing systems: letters, based on representing sounds; and ideograms or icons, which represent whole ideas or words, rather than a phonic chain associated with the intended meaning. However, as stated above, Saussure only takes into account oral verbal communication. Moreover, Saussure was the father of semiology (nowadays called semiotics), which he describes as the study of signs and, he says, linguistics is only one branch of semiology. In spite of this, his book completely disregards any possibility of communication not related to a form of sound, let alone non-verbal communication.

Saussure also stresses that the signs, albeit arbitrary, are imposed and inherited. One cannot simply replace one sign (in this case, a word or lower unit) with a different one, because that would result in a failure to communicate. The author defines language as a sort of common dictionary of which each user has a copy. Despite the evolution of languages (which this author, incidentally, only discusses at the phonetic level and not much at the semantic), collective usage tends to conserve such a vast and complex system as intact as possible. In fact, since language depends on social reality, its survival depends on it being

able to adapt to the new circumstances of its users. For example, if nowadays I ask my colleague for a pen, neither of us will think of a feather or a quill, but rather of some kind of plastic stick with ink inside. However, Saussure fails to make more explicit mention of the fact that linguistic changes take effect only slowly and after a great length of time.[32] In this way, it will be possible for this thesis to observe basic meaning traits without having to create two or more different definitions, as the time scope chosen is relatively reduced.

Finally, Saussure also warns of the dangers of superimposing different languages. He begins by explaining that a word exists in relation to something dissimilar for which it can be exchanged, as well as in relation to something similar that can replace it, and illustrates it with the example of a coin. If we have a one-pound coin, for example, we can exchange it for something else (e.g. bread) or for something of a similar value (e.g. a dollar). But one pound is not exactly one dollar, and the same applies to linguistic units. In the linguistic sphere it means, for example, that an English native speaker can refer to a *clock* or a *watch*, whereas for a Catalan speaker both are *rellotges* (and they will need to specify by means of adjectival phrases if the distinction was needed in the context). In the same way, an anchorage for a Greek speaker could be a λιμήν/limen or an ἐπίνειον/epineion, but for a Latin speaker it will always be a *portus*. Therefore, comparison between languages may be interesting, but it becomes useless when dealing with semantic implications. One cannot investigate one language by means of another, it is mandatory to be competent in the language object of study. On a more simplistic level, working from translations is also unacceptable, and is best avoided for the purposes of this thesis. All the texts investigated have been studied in the original languages, translations are only provided as an aid to scholars who may not be sufficiently familiar with Greek or Latin.

All of these concepts about the research on sign systems were grouped by Saussure under the name of semiology. Nowadays, however, we refer to this science as semiotics. A vast amount of research on the field of semiotics and its application to archaeology is widely available.[33] The main point of this semiotic approach is that archaeological artefacts can be "read" or interpreted as if they were texts. While I acknowledge the utility of this approach for the archaeologist, I would like to emphasise that the objects of interest for this thesis in the first instance are texts, rather than artefacts. Because of this I shall be

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[32] He does distinguish, though, between *period* and *epoch*. The *epoch* is the state of the language at any given time, whereas the *period* is the result of its evolution after a certain length of time.

[33] See, for example, Preucel, 2006; Nash and Children, 2008; Bonde and Houston, 2013 or Yatromanolakis, 2009.

examining only the bibliography related to linguistics studies. A quick check on the linguistics dictionary (Crystal, 2008[6], ss. vv. *semiotics*, *syntax*, *semantics* and *pragmatics*) helps us establish the following relation in linguistics studies (Figure 2):
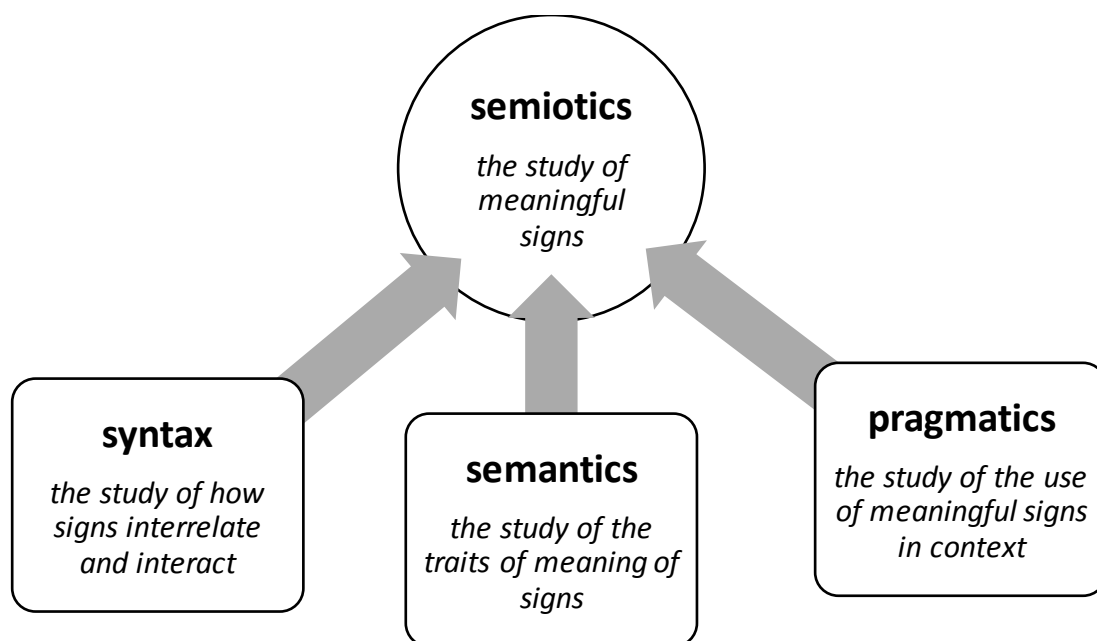
Figure 2. Semiotics and its disciplines

Ever since Aristotle presented his *Categories*,[34] linguists have been trying to find a way of analysing word meaning. The main setback with semantics is that there is no metalanguage with which we can talk about the meaning of words, unlike in other areas of linguistics (phoneme, morpheme, clause…) and, indeed, other sciences: *thermodynamics, phase shift, capacitance* are all technical words in engineering, as *chalcolithic, coprolite* or *bathymetry* are employed in archaeology. Thus, the problem is that the only way to define words is by using other words related to them (e.g. synonyms, antonyms, superordinates, etc.). The handicap is that the interlocutor needs to know what these substitute words mean. If I define the bow of a ship as the opposite of the stern, I may well get asked what the stern is. However, the most effective method seems to be a combination of Decompential Analysis and Prototye Theory.

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[34] The *Categories* are the first of the six books that form Aristotle's treatise on logic, known as the *Organon*.

2.2.3 Katz, Fodor and the origins of Decomponential Analysis

The only means we have nowadays to grasp the meanings of ancient, no longer spoken languages is through their textual evidence. In consequence, in this thesis literature shall be treated as representations of speech acts, and the usual techniques of linguistic analysis will be applied to written documents instead. The most adequate procedures in this case are decomponential analysis and prototype theory. Note, though that the scholarship I will refer to in the following sections might seem quite old, but it is not outdated or obsolete, as these are linguistic theories that are generally accepted, and any attempts to update them do not provide new, valuable insights. Therefore, I shall make use of the original documents, as they are sufficient to explain the concepts.

The foundational paper that set the basis for decomponential analysis was co-authored by Katz and Fodor (1963). This well-known text is quite dense, therefore I will only summarise the points in it that are relevant for the methodology of this thesis.

Katz and Fodor sought to formulate a semantic theory for a natural language, taking English as a case-study, but hoping that their findings could be applied in any other natural languages, something which they accomplished. These authors understand natural language as a combination of grammar and semantics, undestanding by grammar all formal aspects of language (phonetics, morphology, syntax, etc.). The skill in both areas, grammar and semantics, acquired by the native speaker, allows him or her to both produce and understand an infinite number of sentences in the language, with the only possible exceptions being unknown technical words.

Katz and Fodor take the grammatical analysis for granted, because this has been studied and described in a way that is already satisfactory. Therefore, in order to fully understand any sentence − any possible sentence in the language −, a semantic theory is needed. Semantics account for several things, most importantly:

1. Sentences that have the same grammatical structure but different meaning. E.g. *the dog bit the man* vs. *the cat bit the woman* are both formed by a noun phrase in the function of subject, a transitive verb, and another noun phrase in the function of direct object.

2. Sentences that have different grammatical structure but the same meaning. E.g. *the dog bit the man* vs. *the man was bitten by the dog*, the latter consisting of a

noun phrase in the function of patient subject, a verb in the passive voice and a prepositional clause in the function of agent object.

3.   Sentences that have an acceptable grammatical structure but that "don't make sense": e.g. *the paint is silent*, vs. *the paint is wet* or *the paint is yellow.*

The authors also seek a way of analysing the semantic components of a given word or sentence so that any possible ambiguities are resolved. For example, a sentence like *the shooting of the hunters was terrible* can be interpreted in three different ways:

a.   "It was very sad that the hunters were executed".

b.   "The hunters had a very poor aim when they fired".

c.   "The hunting party was very bad".

Because of this, Katz and Fodor make a special emphasis on the importance of context. While the previous sentence is ambiguous in isolation, having a longer piece of the discourse would certainly eliminate the wrong interpretations. For example: *the shooting of the hunters was terrible, they didn't even scratch the rabbit* (meaning b) or *the shooting of the hunters was terrible, it rained all day* (meaning c).

Another issue that the authors greatly insist on is the experience that speakers have of their interactions with the world. Compare the sentences: *we sell alligator shoes*, vs. *we sell horse shoes.* For the average Western speaker, it is known that shoes can be made of alligator skin, and that horses wear shoes, but not the other way round (i.e. one would not expect that an alligator wears shoes or that one's shoes are made of horse skin). Therefore, these sentences will acquire very different, unambiguous meanings despite having the same grammatical structure.

Katz and Fodor then introduce what they call "the dictionary", in reference to the study of meaning as that described in the dictionaries. They then propose their own way of organising meaning markers around features that are equal and features that are distinct, with a special focus on sex antonyms (*aunt* vs. *uncle*; *cow* vs. *bull*). One must say here that both authors, as precursors of the theory, first systematised their analysis of meaning using tree-like schemas (see esp. the analysis of bachelor in p. 186 fig. 4), which is no longer the practice nowadays. Nowadays, the tendency is to use a plus-minus system that accounts as well for the final issue raised by these linguists. For them, a semantic theory must not only account for what features distinguish each word (e.g. a *bull* being 'male' and a *cow* being 'female') but also what is the relation of each word with the rest of the vocabulary in the

language, i.e. what markers each word has in common with the other elements in the lexicon (e.g. the cow and the bull being both 'adult bovine animals'). If we had to define those terms nowadays using decompenential analysis, we would elaborate this sort of chart:

	bovine animal	adult	male
bull	+	+	+
cow	+	+	-
calf	+	-	+/-

The attraction of the application of Katz and Fodor's paper in this thesis lies in that they advocate for a holistic approach to the study of language. While all the terms studied in this thesis are known to have at least one thing in common (they are all places where one can moor a ship in one way or another), the aim of this thesis is to investigate the meaning relationships, i.e. what other markers they do or do not have in common. While Greek and Latin are both natural languages (i.e. they did have native speakers), their evidence is limited to the textual relics that have been preserved in each case, which is also why taking the full context into account, as also emphasised by Katz and Fodor, will be of great importance. However, language use cannot always be differentiated throughout yes/no questions, because it depends greatly upon the intention and register of the speaker (in our case, the writer), and in order to account for the large areas of grey in between the extremes, it is suitable to recur to another, somewhat newer, principle: the prototype theory.[35]

2.2.4 Geeraerts and the potentialities of prototype theory

Geeraerts (1989) offers a good summary of the potentialities of prototype theory, while he also admits that the definition of what constitutes a prototype is a problem in itself. In spite of this, prototype theory has proved extremely helpful and has developed in a number of aspects: psycholexicology, cognitive linguistics and even Artificial Intelligence. When the prototype approach was first adopted, it had the negative side effect that linguists refused to carry out decompenential analysis. However, as Geeraerts very sensibly points out, there can be no semantic description without some sort of decompenential analysis.

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[35] For a concise summary of the prototype theory and its ramifications, see MacLaury (1991).

Prototype theory advocates the association of concepts in relation to a prototype, or an element considered to be the most representative of its category. The features in decomponential analysis are criterial (i.e. they respond to a yes/no question and therefore entail that in order to be a member of a category, the element must have all of those characteristics as indispensable). Contrary to that, Geeraerts notes, prototype theory offers the advantage that there is not a single set of characteristics to which all members of a category must abide by.

The second concern raised by Geeraerts is that meaning in natural languages cannot be studied in isolation from the encyclopedic knowledge of individuals. In my opinion, experience would be a better term than encyclopedic knowledge, as the perceived experience of the speakers can account for differences in the language (although Geeraerts does not mention this explicitly). What Geeraerts does observe is that experience accounts for metaphoric extensions, such as saying that someone "is a lion" meaning that they are brave.

Prototype theory is also valuable for tackling the fuzzy boundaries between words. Geeraerts does not give any specific examples, but one could adduce the very famous discussion about whether tomatoes are fruit or vegetable. While tomato is a clear-cut object, the concepts fruit and vegetable are not so, and therefore that particular foodstuff could fall into either of the two categories, depending on what we consider a prototype fruit or a prototype vegetable to be. Because of this uncertainty, Geeraerts provides four indications of what a prototypical category, such as fruit or vegetable, should be:

1.   Categories cannot be defined by one single set of criterial attributes.
2.   Prototypical categories exhibit a radial set of clustered and overlapping meanings.
3.   There exist degrees of category membership: not every member is equally representative / prototypical of the category.
4.   Prototypical categories are blurred at the edges.

Geeraerts goes on to make further considerations on the peripheral members of a category and states that cognitive linguistics is also interested in how the centre of the category can be extended and to what length. The centre of the category, i.e. the prototype, is represented by that item in the group with which the most items overlap in meaning, or ressemble more closely.

Before ending the paper, Geeraerts warns against the belief that the mental categories are neat and clear-cut, because they probably depend on the speakers' experience, and they cannot and should not be studied out of context. It is because of this reason that the texts examined in this thesis have been taken into account in as much length as possible. Similarly, he also shows that it is important to distinguish who is speaking because, for example, water will not be the same for the mundane speaker ("tasteless, transparent drink that quenches thirst") than for the experienced hydraulic engineer ("H_2O in its liquid state"). In this sense, while the two proposed definitions are not mutually exclusive (i.e. the product whose chemical form is H_2O is still tasteless, transparent and quenches thirst), it will be important to bear in mind throughout this thesis that the usage of the terms is likely not to be the same in the *Stadiasmus*, a professional harbour-guide, than, say, in novels.

2.2.5 Labov on fuzzy word boundaries and the limits of prototype theory

In this sense, Labov (1972) proved that it is difficult to classify an object within one word category or another if it is not a prototypical member of its class. In his experiment, he asked students to name a range of drawings of kitchen recipients as either cups, bowls, mugs or vases. This caused the students to consider things like: if a cup has no handle, is it still a cup? If it is filled with flowers, is it still a bowl?

Shape and function of the objects played an essential role, and it greatly confused speakers when these were altered in some way (fuzzy-edge phenomenon). Still, what is essential to remember is that all of the objects (or references) that have perceived similarities fall under the same name (or sense). Vagueness is also one of the motors for language change, but that need not worry us much because the period selected for this study is sufficiently restricted.

Incidentally, Labov's conclusion was that dictionary definitions are useful because they aim at defining a whole range of objects in the real world, but that «semantic theory (…) can find firm ground if we take even one step away from the intuition of the theorist and towards the observation of language use». The observation of language use is, in a nutshell, what my thesis aims for.

2.2.6 A note on the study of technical jargon

It is important to take into account the potential existence of technical jargon. While the words λιμήν/limen and *portus* are the standard terms for harbours, the existence of sub-terms that are specialised attests to the existence of a specific vocabulary. On the subject of technical vocabularies, I refer to the very interesting paper by Schironi (2014). The paper begins with a very sensible definition of the concept of technical language as «all the linguistic elements employed by a restricted group of speakers to name, define and discuss the contents of a particular discipline». According to established research, technical terms need to be standarised, concise and monosemic; non-judgemental; and seldom used, but possibly understood, by non-specialists, and experts can employ the colloquial terms if they feel it appropriate to make themselves understood. I think a good example fulfilling all three criteria is the oil pump, or pumpjack, which is colloquially known as the *nodding donkey*.

The study of technical terms in ancient Greek is problematic for two reasons. Firstly, the disciplines themselves (medicine, astronomy, mechanics, etc.) were not fixed, and when they became more established, they were still lacking terminology. Often, technical texts were written in the form of didactic poetry and constrained to metrics, Schironi remarks, but this is not an issue for this thesis, as I am generally dealing with prose. Instead, the main challenge in my research is that geographical or historical texts tend to follow rethorical models (e.g. praising a port in order to flatter a city) and one wonders to what extent the texts are actually credible or else they are part of an entertainment or propagandistic effort. Hence the importance of double-checking the texts with what is known of the sites to which they refer. The second issue is that, since the Greeks were the first to make certain discoveries or to define certain phenomena, they had to create the words for those as well. But, unlike today, when we can rely on a foreign metalanguage (ironically, this is usually Greek), Greeks only had their own, everyday language. Schironi points out that this made the specific terminology more accessible to non-specialists but it had the disadvantage that they had to develop it from scratch. I would add that the fact that the Greeks (or indeed the Romans) had to use everyday language entails, at least in the case of this thesis, that confusion may occur in some cases when we cannot know if the author was referring to something specific or just using words approximately. I have, however, endeavoured to select texts that offer sufficient clarity on this point.

Schironi's paper further explores how technical terms were formed in the specific cases of medicine and mathematics. These two sciences are selected because a number of other disciplines derived their terminology from them. She demonstrates that there are three strategies for forming technical terms: a) using existing terms with a specialised meaning; b) slightly modifying existing terms by suffixation or compounding; c) metaphorical uses to existing terms. Respectively, examples of the previous are: φῦμα 'something that grows' > 'tumor'; ἀρθρῖτις 'inflamation of the joints' (<ἄρθρον 'joint' + -ιτις, to denote inflamation); περόνη 'pin of a buckle' > 'leg bone'.

Although these technical words do not belong to the same semantic field studied in this thesis, the paper furnishes enlightening guidance on the processes that I discuss myself. The evidence that I work with consists of existent words in the everyday language that have been endowed with specialist meaning. In this way, when a sailing guide such as the *Stadiasmus* warns its users that there is not a λιμήν/limen but a σάλος/salos, for example, sailors should have known that it was dangerous to approach the coast, and to drop anchor in the seas instead, despite σάλος/salos being such a common word to denote 'agitation'.

2.2.7 Coleman and Kay: integrating Decomponential Analysis with prototype theory

A practical example of how to integrate the decomponential analysis mentioned above with prototype theory is the paper by Coleman and Kay (1981). In that paper, the two linguists investigate the English word *lie* in the context of the prototype theory. However, at the beginning they make several remarks on what it means to be a member of a category in relation to a prototype, namely:

- Prototypes contain a finite list of properties.
- The individual properties of the members in comparison with those of the prototype are treated as either satisfied or not.
- Membership to the category is a gradient phenomenon (e.g. if the prototype of a *bird* is a *robin*, then a *duck*, for example, is still a *bird*, although not a prototypical one).
- Satisfaction the properties on the list to a certain degree contributes to membership of the individual into the category.
- Satisfaction of each property on the list does not necessarily contribute equally to membership into a category (e.g. if the prototypical *bird* is a *robin*, the ability

to fly is not equally necessary for being considered a *bird* than the fact of possessing wings, think of *ostriches*, *penguins* or *chickens*, for example).

Coleman and Kay then analyse the conditions for a speech act to be considered a lie. In order to do this, they elaborated a list of three properties (a: something is not true; b: the speaker belives it is not true; and c: by saying that thing, the speaker intends to deceive the addressee), and they prepared a questionnaire with eight stories to test if the wider audience considered each to be a lie or not. These researchers went slightly further than simply marking the qualities with +/-, but they also assigned a system of points to each plus and minus (Figure 3). The system of points was not feasible in my thesis due to the extremely divergent nature of my data.

STORY		ELEMENTS			RAW SCORE	+ lie	SUBJECTS can't say	− lie
		1a	1b	1c				
I.	(Moe)	+	+	+	466	67	0	0
II.	(John)	−	−	−	71	0	0	67
III.	(Pigfat)	+	−	+	245	25	3	39
IV.	(Katerina)	−	+	+	346	50	4	14
V.	(Schmallowitz)	+	+	−	315	41	6	20
VI.	(Mary)	−	−	+	233	18	7	42
VII.	(Nurse Braine)	+	−	−	199	18	2	47
VIII.	(Superfan)	−	+	−	309	38	8	21

Figure 3. Decomponential analysis of the word lie *by Coleman and Kay (1981: table 5)*

As we can see, not all stories test positive for all aspects of the prototype, or "perfect version of a lie". It is also interesting to see what the subjects consider to be or not to be a lie according to their background, as in the case of the nursing students on p. 39, who seem to have a different opinion from the average speaker due to their environment. However, the researchers have shown that out of the model properties of the prototype, there is one that is more salient than others, in the case of *lie*, which is the express believe that it is not true (condition b above). While that property is more "essential", the more the other properties are fulfilled, the more prototypical the object will be.

2.2.8 Word relationships: superordination and hyponymy

This section would not be complete without a note on word relations. However, the problem with semantics is that it has no "technical language" to describe it: the only way to describe language is by using language itself. This is commonly achieved by recurring to some sort of linguistic order embedded in language itself, and in particular through

relations of superordination, hyponymy, meronymy and synonymy.[36] The discipline that researches those aspects is called cognitive linguistics.

Cognitive Linguistics is the branch of language studies that researches how we, as language users, interact with the world around us by means of our speech acts or written papers. To this end, the concept of categorisation plays an essential role, and it was readily accepted by scholars since it was first formulated. Details about the action of categories can be found in Ungerer and Schmid (1996 : 60-109), although here I shall recollect only the more salient aspects of categorisation.

Simplifying, Ungerer and Schmid explain that we live in a world surrounded by readily identifiable organisms and objects, such as dogs, trees, houses and cars. However, when it comes to naming such objects in a concrete speech act, speakers may choose between different language levels, such as *animal, dog,* or *Yorkshire terrier*. Therefore words in language relate to one another by virtue of a hierarchical relationship, that effectively works by virtue of the principle of class inclusion, albeit unidirectionally (i.e. a *terrier* is a member of the *animal* category, but an *animal* is not necessarily a *terrier*: it could be an *elephant* or a *pigeon* as well). A paradigmatic case of categorisation, although for other scientific purposes, is the classification of plants and animals begun by Swedish botanist Linnaeus in mid-18th century, still in use today.

After this initial description, Ungerer and Schmid make a point that not all levels in the category convey the same quality of information, with the middle level usually preferred for everyday communication. For example, on a daily basis one would refer to one's pet as a *cat*, rather than as a *British Shorthair* or an *animal*, unless the context requires so. Indeed, the word *cat* evokes a more specific image and an obvious discontinuity in comparison to, for example, *dog, fish, beetle* or *armchair*. In the words of Ungerer and Schmid: «the basic level is where the largest amount of information about an item can be obtained with the least cognitive effort». This principle is called *cognitive economy*. In the same way, and particulary in Greek, it seems a priori plausible that one of the anchorage categories is preferred above the others for general communication, whereas the others would add some sort of specific connotation to a generic idea.

Another interesting point made by the two authors is that categories are strongly culture bound. They illustrate this with the plant names in Tzeltal, a Mayan community in

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[36] For a discussion of these phenomena see Cruse, 1986; Murphy, 2003; Taylor, 1995; and Peters, 2003.

southern Mexico. Speakers of that language do not have a generic equivalent for *plant*, and their basic broad categories for plants correspond to *tree*, *corn* and *bean*. To the western eye, these belong to two different categories (the *tree* being a class, while the *corn* and the *bean* can be classified within the genus). This is due to the clearly salient condition of corns and beans in the regional diet as opposed to the other trees and plants. This issue alone justifies the fact of carrying out the research directly in the language of study, rather than through translations.

Ungerer and Schmid do report some empirical evidence for the classification of linguistic categories. However, those are based on evidence obtained from actual speakers, while Latin and Greek are dead languages, and therefore it is not possible to apply the same methodologies. The discussion follows on the properties and advantages of having different levels of categorisation in the language. The explanations and diagrams provided are perhaps not the most straightforward, but the concept is easy to summarise in that the categories to the higher end of the scale, the superordinates, collect only the few most salient characteristics, while the categories to the lower scale, the hyponyms, add more and more characteristics and denote objects or things more and more specific every time. A very pertinent example adduced by the two authors is that of a supermarket. When we enter a supermarket, even if it is one where we have never been before, it is easy to navigate our way around thanks to the cflassification of the products by broad categories: *fruit and vegetables, meat, bakery, bathing products, cleaning products*, etc. Then, the closer we go into each section, the more specific the labels become. For example: *dairy > milk, yoghurt, butter, cheese > Cheddar, Gorgonzola, Emmental*, etc. Yet again, the authors emphasise that the category relationship depends strongly on the eyes of the viewer and in context, and that it is not self-evident what superordinates refer to, particularly in the case of non-prototypical categories. For example, if someone warns that "there is an insect in the room", we will probably think of a mosquito or a fly, rather than a mantis, for instance. Hence the importance of understanding context, and the reason why the textual evidence for this thesis has been examined in as much extent as necessary.

Later on, Ungerer and Schmid embark on a dubious theory trying to explain that there are no "simple" subordinates. To sum up their view, they argue that hyponyms are not simple lexemes because they are all compounds or derivates from simpler, more ancient linguistical roots. The examples they use are, among others, *daisy* ('day's eye'), *dandelion* (from French: *dent de lion*, 'lion's tooth') and *terrier* (from Latin *terra*, 'earth, ground').

This view is, however, fallacious. While etymology can indeed provide useful information about how speakers understand the world around them (e.g., the daisy can be compared to the solar disk or terrier dogs can be observed to chase animals like hares that hide on the ground), it is by no means true that *all* nouns in the language are compounds or derivates from simpler ones. It is true that some compound nouns may become simplified (e.g. present-day English *latte*, from Italian *caffè e latte*, 'coffee with milk'), or that some metaphors may come into action to the point that they are no longer perceived like metaphors (surely nowadays not even the French speakers think of that characteristic yellow flower as representing the teeth of lions), or that some words are derivates from others (e.g. English *maisonette* 'a flat with its own entrance' < French *maison* 'house'). But the statement of those two authors is certainly not universally valid, and there are plenty of examples to prove so: for instance, a *spoon* in present-day English is in no way a more complex lexeme than its Old English predecessor *spon* ('sliver, splinter of wood'), but it only appears documented in the sense of the 'eating utensil' since ca. 1300, which is probably when speakers felt that that particular object should be named in that particular way. The reason why a brief etymological investigation for each term has been added to this thesis is in order to help clarify the characteristics of each anchorage from a primordial linguistic perception, rather than to justify whether those are complex hyponyms or not.

Ungerer and Schmid's chapter closes with discussion on verbs and adjectives, but those do not concern this thesis as the primary lexemes studied are all nouns.

2.2.9 Another perspective on taxonomies: Cruse's lexical hierarchies

After the considerations above, one must raise the issue of classifying the linguistic units. To put it simply, words do not exist in isolation, but in relation to others, and it is often by this contrast that we refer to them. For example, 'bedsit' exists in relation to 'not house' (antonymy), 'studio' (synonymy) and 'dwelling' (hyponymy). Following the principle that perfect or total synonymy does not exist, and that the same is valid for antonymy,[37] lexical hierarchies shall offer a more effective solution for the classification of the Greek and Roman harbour vocabulary. I shall provide here only one clear bibliographical source:

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[37] I.e. it depends on context. For example, depending on context, an antonym for 'little' could be 'big', or 'a lot of'. Compare: *a little baby*, vs. *a little delay*.

Cruse (2015[3]). Although some parts of this book are of debatable quality, chapter 8 on lexical hierarchies (2015[3] : 167-175) is reliable.

Cruse starts that chapter by explaining that words are traditionally organised in branching hierarchies. Such hierarchies are characterised in terms of dominance and differentiation. The relation of dominance operates at a vertical level, whereas the relation of differentiation applies on the horizontal plan (Figure 4). In addition, the branches never come back together as one descends to the lower levels of the hierarchy. In the reverse direction, as one goes from the lower levels to the upper levels of the branches, there is only one single element above each rank (this is known as the unique mother constraint):
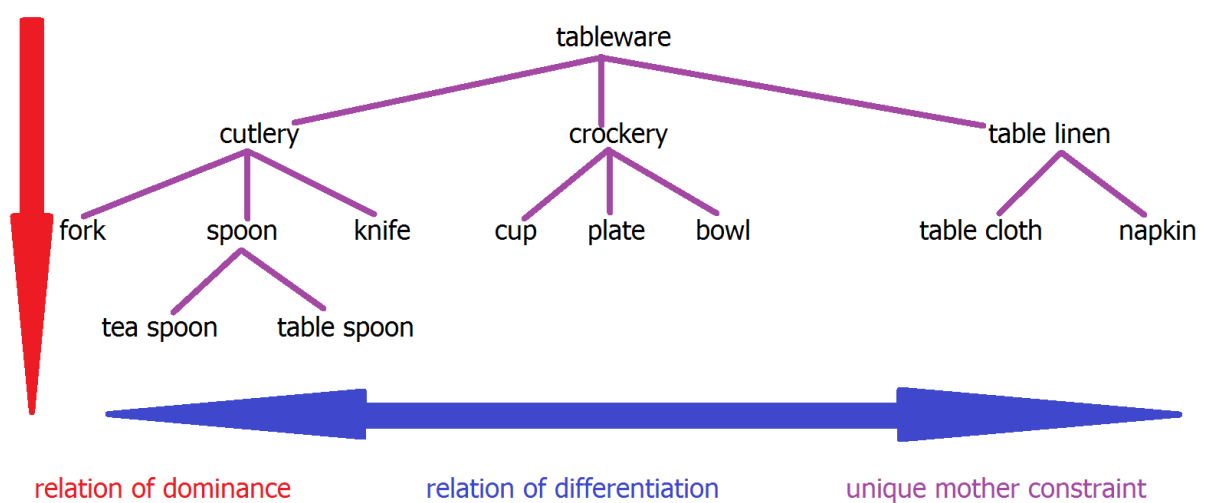
Figure 4. schematic representation of an ideal lexical hierarchy, after Cruse (2015[3] : 172, fig. 8.3), with modification

Cruse notes that, on average, taxonomic hierarchies used in everyday language rarely have more than 5-6 levels. On the contrary, the number limitation does not apply to expert, technical vocabularies. However, as shown above, Greek (and Latin) technical vocabulary is taken from everyday language in most cases, therefore we should not expect a priori that the levels of hierarchisation be high.

However, as usual, there are many exceptions to the rule. Firstly, gaps are quite frequent in taxonomic hierarchies, especially in levels above the basic level. For example, what is the superordinate of *walk, run, crawl, hop,...*? Sometimes, this gaps may be occupied by an item in the immediate level below. Compare:

A: *Are you wearing skirt or trousers?* B: *I'm wearing trousers.*	(skirt: item of clothing with both legs together; trousers: item of clothing separating both legs)
A: *Are you going to wear jeans?* B: *No, I'm wearing trousers.*	(trousers: … made of a material other than denim; jeans: … made of denim)

In this sense, Cruse argues, hierarchies are also context-dependent. In his words, the elements of each hierarchy are not full (abstract) lexical senses, but contextually circumscribed sub-senses. Because of this it was so important in this thesis to take into account as much context in the data as possible. In addition, Cruse admonishes that everyday categories can vary in different languages not only in the semantic space covered by each item but also in what items are recognised. The examples adduced by Cruse in this aspect are misleading, therefore I suggest a more illustrative case of my own (Figure 5):
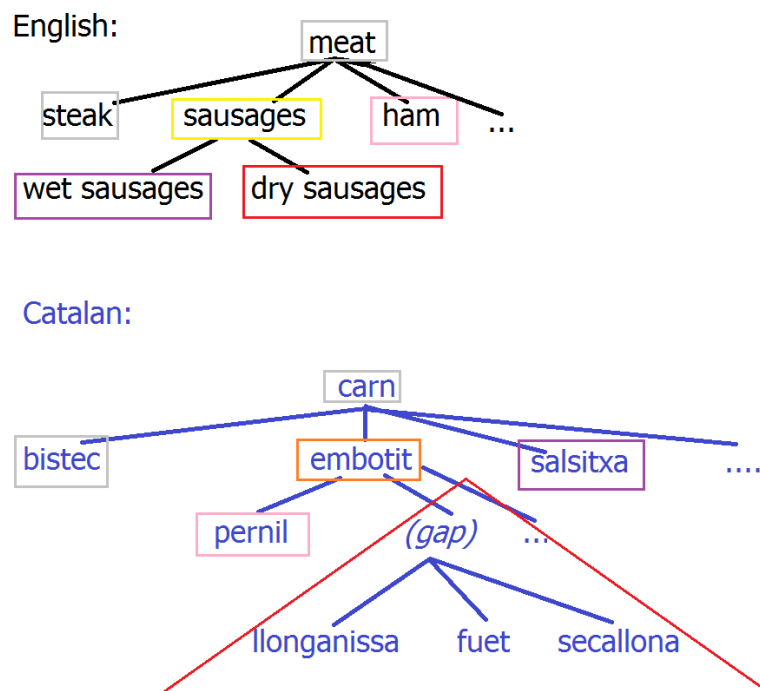
Figure 5. Lexical taxonomies may vary in different languages

Meronymy is a specific kind of hierarchy, in which the elements are organised on part-whole relations, as in: body → arm → upper arm, elbow, lower arm, wrist, hand → palm, fingers etc. Throughout the thesis, it is one of my aims to investigate if that was the case in Greek or Latin. Meronymy also suffers from occasional lexical gaps. For example, a *spoon* has two parts: the *handle* and the…?

The interesting question posed by the existence of these gaps is whether the lack of a word also represents the lack of a concept.[38] In some cases, it may be the case that a lower element in the hierarchy assumes the position of the missing higher element, such as the case with trousers and jeans above. However, this is not the case. In the example above with the meats, I pointed to a lexical gap in Catalan to group *llonganissa, fuet* and *secallona*, which any Catalan speaker would recognise as belonging to the same "type", based on their aspect and production processes. However, as a native speaker, I can confirm that there is no word to refer to that "type" as a whole. The key here is that I, along with ca. ten million other people, are living native speakers. Elucidation of these issues in Greek is certainly not an easy task.

2.2.10 The complication of polysemy

At the start of my research, a possibility emerged that the words I am exploring might be polysemous to some degree. Because of this, it was necessary to review some general information on the phenomenon of polysemy. Taylor (2003) examines concisely the more accepted models in cognitive linguistics that address the concept of polysemy.

Taylor defines polysemy as «the association of two or more related meanings with a single phonological form» (p. 32). He omits to say, though, that this occurs only in the theoretical frame, the adequate sense for every speech act becomes clear from the context (with the possible exceptions of jokes and puns). While this definition is simple and clear, a number of issues arise from it. Firstly, as Taylor points out, it presupposes our capacity to identify and describe every distinct meaning of the lexical units (pp. 32 ss.). Related to this is how can we quantify the number of different meanings of each term and the ways in which they relate to one another. Indeed, polysemy entails that the different meanings are related from a same original idea, and that they derive from and belong to the same lexeme. Different lexemes or different etymons result in homonymy, not polysemy. Taylor adduces the example of the English word *over* (p. 32). I believe another good example would be the word *college*, in expressions like "my son goes to college" or "I am a member of the Royal College of Physicians": to what extent is the meaning of *college* in these two

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[38] Cruse discusses this issue on p. 174, with the particular case of the Greek word χέρι, which can refer to the hand or to the arm as a whole. However, this is miss-transliterated as *xeri*, the correct transliteration should be *kheri* or *cheri*.

expressions unique? This is a pressing complexity that will need to be addressed throughout my thesis.

Taylor also notes that, since most words are polysemous to some degree, possibilities for ambiguity increase, particularly as the addressee of the message has to select one of the potential meanings of each word in every act of communication. In this way, theoretically, given a sentence, the more words in the sentence, the more interpretations it can potentially have and the more ambiguous it becomes with every different acception of each word that composes it. Yet, Taylor points out, for most language users most of the time, the selection of the proper sense of each word in each sentence is not a problem at all (p. 33). In fact, most of us most of the time are unaware of any potential ambiguity caused by polysemy. In this respect, Taylor concludes that the models whereby polysemy represents a problem are applicable only to highly idealised situations and as a general rule do not fit the common communicative situations (p. 34). Compare *old* in *an old man* ('aged'), *my old friend* ('we have known each other for a long time') or *her old student* ('he is no longer her student'). While the meanings of each of these expressions are not rigid (e.g. if all of the students of the professor were young except for one, that could effectively be singled out as *the old student*), the average speaker should not have any difficulties in identifying the correct sense in a given context. Therefore, implicitly, this confirms that should some of the terms researched in this thesis present polysemic variants, the reader should be able to detect them.

Next, Taylor discusses what scholars consider to be polysemy (pp. 34 ss.). Saussurean models simplified language to "one form, one meaning", something that is inexact to begin with. However, taking this as a starting point, Taylor makes three points: firstly, he very sensibly argues that minor differences in pronunciation or contextual content should not be taken as signs of polysemy. Compare, for instance, the segment *want to* pronounced in a slow, articulated way, or at a fast, colloquial pace, when it sounds like *wanna*. Similarly, compare the action expressed by the verb *to eat* when the object is a steak or else an ice-cream. Taylor also argues convincingly that metaphor, where transparent, should not be considered an instance of polysemy either. Compare the act of *eating food* with clauses like: *acid eats away the metal* or *inflation is eating up my savings*.

Thirdly, Taylor highlights homonymy as a warning against the omnipresence of polysemy. Homonymy is the likeness of a graphic or phonetic form, or both, between two or more words, without them being the same word. This is usually identifiable because those words

come from different etymons. A good example of total homonymy (i.e. homophony and homography) is adduced by Taylor in the word *ball* 'spherical object' vs. *ball* 'social event'. He explains that they are homonyms because their meanings are not related. However, I believe the existence of different etymons is a better indicator for homonymy. The name of the toy comes from Old English **beal, *beall* (evidenced by the diminutive *bealluc* 'testicle'), or from cognate Old Norse *bollr* 'ball', from Proto-Germanic **balluz*, from a Proto-Indo-European root **bhel-* (2) 'to blow, swell'. The dancing social event was borrowed from French *baller*, from Latin *ballare* 'to dance'.[39] Instead, a good example of polysemy could be the word *bow*, originally the tool used in archery to shoot arrows, later, by virtue of shape resemblance, it also came to designate the wooden stick with horse hair with which one plays the violin and similar musical instruments. This is likely to be the kind of polysemy that I may encounter in the research for this thesis.

Following that, Taylor discusses borderline cases, such as those words that can be confusing because of phonetic or orthographical variants (p. 37). For example, the pronunciation of *record* as a noun or as a verb has the stress syllable in a different position: does that constitute a polysemic word? In the same way, British speakers distinguish between the *programme* of a conference or the *program* of a computer, but to what extent can these two words be considered different lexemes, when the latter clearly comes from the former? This is certainly an important topic, but as I am dealing with a very restricted set of nouns, pronunciation or orthographical variation is not likely, a priori, to cause any issues.

The conclusion of Taylor's paper is that polysemy can be identified unproblematically in terms of derivation from an idealised linguistic model that states that each word conjoins a fixed and determinate phonetic or graphic structure with a fixed and determinate semantic structure. In other words, polysemy occurs when one single phonetic or graphic chain is linked to two or more potential meanings. However, he also remarks that speakers of a language are perfectly able to extract patterns which sanction the combination of each lexical unit in relation to the others. Taylor also insists throughout his paper that a lexical unit can go beyond the chain of characters written between the blank spaces of the paper. For example, any competent speaker of English would not understand the petition to *turn the radio up* as an order to physically grab the radio and place it in a higher position. This is because the presence of the word *radio* entails that the phrase *turn up* refers to the

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[39] Etymological data extracted from: http://www.etymonline.com/index.php?allowed_in_frame=0&search=ball, consulted: 24th July 2017.

volume, and therefore there cannot be any ambiguity for the addressee as to what is the action required. The lesson for this thesis is that context is essential, and this is why I have endeavoured to read as much of the texts as necessary for an effective investigation.

2.3 The problems of conjoining literature and archaeology

Ancient Greek and Latin are dead languages, as there are no longer any native speakers of those linguistic varieties. Also, no-one nowadays acquires those as a first language "by birth".[40] Indeed, it is impossible to perform an experiment such as those for any present-day languages, in which objects or photographs are shown to volunteers in order to ask them what word best defines those realities. Bibliography on how to deal with corpus languages (i.e. those which, like ancient Greek or Latin, only consist of a limited number of testimonies) is extremely scarce. Some research has been done in the field of pragmatics, such as Bakker (1988), but it touches more on the field of syntax and prosody than on semantics. The volume edited by De Jong and Rijksbaron (2006 : 188-239) contains some studies on pragmatics, but they focus more on the effects of language on the behaviour of Sophocles's characters rather than on semantics.

Initially, I believed it would be useful to consult similar studies on landscape perception in the literature, and I found few such analyses similar to the work undertaken in this thesis. For example, the book edited by Gilhuly and Worman (2014) had a very promising title (*Space, Place and Landscape in Ancient Greek Literature*), but, upon reading it, all of its papers deal with cultural, sensory, psychological or aesthetical experiences and make no point to analyse objective physical descriptions of the places discussed from each of the ancient sources. A potential heuristic field would be the *Tabula Imperii Byzantini*, although it focuses on toponymy.

Some studies for medieval texts have also been consulted, but they were found to not address the terminology employed by the texts, like in this thesis. For example, Fumagalli (1994 : 67-148), presents very interesting comments in part II of his book *Landscapes of fear*, which deals with the descriptions of cities. However, his comments focus mostly on the social context, rather than on physical structures, and he also fails to refer to original

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[40] For discussion on the concept of dead languages and the implications of broken tradition, see Buccellati (2012).

sources as well. Similarly, Benozzo (2004), seems to provide only aesthetic reflections on the artistic literature examined, something which also causes his narrative to approve of or dismiss other research based on his personal opinions rather than on whether what the texts say, even if fictional, is plausible or else based on poetic rules. Consequently, modern research on landscapes in literature has been disregarded.

Allison (1999) is one of the rare authors who addresses the issue with the terminology. In her excellent paper, *Labels for ladles*, she provides guidance a contrario of the mistakes that a study like this thesis must by all means avoid. In this paper, Allison investigates the tradition of archaeological knowledge in the specific case-study of the names attributed to Roman household assemblages found in Pompeii. Household artefacts recovered from excavations are usually sent to a specialist so that they can write a typological description which helps understand the production of the object, its trade, its uses, etc. This usually voids them of context, and impoverishes in an irreplaceable way our understanding of the specific site in which they were found. Allison argues for a classification that takes into account the objects from the original unit of the excavation, so that objects found in the same house or building can be grouped together for a better understanding of the context of that house or building (e.g. state of occupation, use of space). As the author herself argues, this separation of the artefacts from their original locations also entails linguistic implications.

As a reference point, Allison points to Daremberg and Saglio's *Dictionnaire des antiquités grecques et romaines* (1877). These authors' working method was first to find the names of the objects in the extant textual sources, then compare them with physical archaeological remains, and when possible, illustrate the dictionary with images of these historical objects. Thus, they intended to give Latin names to objects found in the excavations. But, Allison argues, assigning them a name also very much determines the function or functions assigned to those objects – and in some extreme cases, this is a mistake. Her implicit criticism, with which I unreservedly agree, is that the first author (in this case, Daremberg and Saglio) provided only a hypothesis or guidelines in relation to the characteristics of the object (and making it very clear that it was just a theoretical framework), but that subsequent authors take those mere guidelines as a reference truth. This generates a number of wrong assumptions that a simple look at the actual evidence should be enough

to invalidate. By the end of the article, she also bemoans the repetition of theories which have been proven wrong decades ago.[41]

Allison also formulates more specific objections by means of specific examples she has encountered during her research, as summarised in the chart below:

case-study artefact	*problem(s) noticed*
arca / armaria (a chest or cupboard for storing various goods)	Failure to relate the use and social implications of the artefact in relation to its location. *Armaria* could also be a name attributed from and depending on modern, not ancient, standards.
cartibulum (a kind of table)	Failure to take into account variation or evolution of the object from those described in the literary texts (and, therefore, in Daremburg and Saglio's dictionary) with the real artefacts discovered in archaeological excavations.
fritillus[42] (a kind of small jar)	Failure to notice multiple or different uses for the object, or naming the object from a similar one in the modern era, rather than scientifically investigating its use in antiquity.
"forma di pasticceria" [43]	Labelling ancient artefacts according to what "they look like" to the eyes of the modern researcher and not investigating closely what they were actually used for.

In conclusion, Allison's paper is certainly very illustrative of the mistakes commonly made in the linguistic archaeological field, and it is worth bearing in mind her advice in order to proceed in the most rigorous and honest way as possible.[44]

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[41] A similar situation occurred in this thesis as I was researching the case study on Alexandria (see the comment on Rhakotis in section 5.1).

[42] The author explains that this kind of little jars have been considered to be little pots to roll the dice as they look similar in shape to the modern object that performs this function. However, more rigorous analysis has found them to contain traces of paint.

[43] The author names two specific examples of artefacts labelled "forma di pasticceria" ('baking mould') which, upon closer inspection, are in fact instruments for personal hygiene.

[44] Allison has also published other analyses of similar scope. See especially Allison (1997) and (2004).

2.4 Historical and archaeological investigations

Archaeology of ports, particularly Roman ports, has roused some interest in the recent times. However, the archaeological bibliography in its current state has one important shortcoming: there lacks a comprehensive work offering a general overview,[45] as data is scattered and focused on individual and specific reports. Because of this, and in order to keep the literature review to a reasonable length, I will discuss here only those works that can provide either fruitful data or useful methodological models for my thesis.

2.4.1 Ardaillon

To my knowledge, the earliest publication addressing the topic of port terminology is the work by Ardaillon (1898). In his thesis, the author investigates the sites chosen for the building of ports and the infrastructure within them. Every now and then, he describes the terminology used to refer to ports, although without quoting the sources directly, only providing paragraph numbers in footnotes, if at all. Ardaillon discusses the terminology in pp. 13-16. However, he only takes into account the words λιμήν/limen, ὅρμος/hormos, σάλος/salos and their derivates. Later on (p. 33) Ardaillon establishes a distinction between natural and artificial ports (respectively, αὐτοφυεῖς/autophyeis and χειροποίητοι/kheiropoietoi). But even in those cases where the site offers a good, natural port, this port may still require human-made arrangements (λιμήν ὀρυκτός / limen oryktos). The main preoccupation is the protection by means of χώματα / khomata, resulting in more sheltered harbours (λιμήν χυτός / limen khytos). If the infrastructure allows for the port to be closed or closable, it then becomes a λιμήν κλειστός / limen kleistos.

While these concise theoretical definitions seem sensible, Ardaillon fails to address specific realities of such terms, not to mention that he barely addresses the differences between λιμένες / limenes and other harbour forms. It is fair to mention, though, that the list of technical terms provided in p. 51 is remarkable (especially those relating to the νεώρια / neoria – shipsheds – and to the ἐμπόριον / emporion – commercial area). Despite the excellent quality of this work, though, terminological research becomes little more than word lists deprived of context, either literary or archaeological.

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[45] Incidentally, the production of such a sourcebook is the main aim of the Portus Limen Project.

2.4.2 Lehmann-Hartleben

A major foundational work on the subject of ancient ports is the study by Lehmann-Hartleben (1923), although nowadays it is quite out of date due to the research that has been carried on since. His work aims to describe the different port types that existed in antiquity from the perspective of archaeological remains. In fact, the greater part of his work consists of a compilation of archaeological examples, some more significant than others, that demonstrate the author's extensive archaeological knowledge. Nevertheless, on the linguistic aspect, he refers to the literature only with passage numbers (which are most of the times relegated to footnotes). The author never quotes the texts directly, but rather explains their contents, and this not always. There is also barely any presence of Greek, and words are translated or transliterated. Lehmann-Hartleben does use labels in his text like *emporion*, *limen kleistos* or *epineion*, but he does not really explain what they refer to, taking for granted that the reader will infer it from context. For the greater part of his work, he seems to reduce the harbours to typologies that succeed themselves in a chronological order: *emporia*, walled harbours, double harbours, lagoonal ports, ports with regular edges… There exists the risk that this might be an oversimplification. The appendix on port toponymy presents further interesting taxonomies, but does not provide essential information for this thesis.

2.4.3 Finzenhagen

Finzenhagen (1939) took up as his foremost aim the task of investigating geographical vocabulary in Greek. His work researches geographical terms in general, not only harbour terminology. His focus is on natural elements of the landscape, and apart from the definition, the author puts a special stress on their etymologies. In addition, Finzenhagen undertakes his literary research by referring fundamentally to the more ancient sources, including those of uncertain reliability, such as the Homeric corpus.[46] This means that there is very little overlap between his work and this thesis, but some of the points he

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[46] Apart from the much debated question of the existence of Homer, or whether the poems attributed to him are the product of one single author, it seems pretty clear that the texts we can read nowadays underwent serious manipulation through several centuries. The usual examples to illustrate this are the anachronistic descriptions of Ajax's shield in his singular fight with Hector (*Iliad*, 7.206 ss.), or the boar tusk helmet in the episode of the *Doloneia* (*Iliad*, 10, 261-265). For further details, see: Pòrtulas, 2008, with further bibliography.

provides are valuable for my research. His work is well worthy of attention in certain aspects such as etymology, even if it cannot provide substantial details for this thesis because, as I have said, he only takes into account natural formations and the more ancient literature.

2.4.4 Rougé

Probably the most concise and helpful investigation on the subject is the work on maritime commerce by Rougé, especially Chapter V of the first part (1966 : 107-119), devoted to terminology. In it, Rougé lists the most relevant vocabulary, including some infrequent terms like the derivates of –δρομή,[47] and summarises their essential characteristics. Rougé's conclusions are essentially correct in regards to the semantic implications and classification of port types, as will be discussed along this thesis. In addition, Rougé used some of the same sources and deals with the same chronological period as this thesis. These sources include the periploi, Strabo, Pausanias, the *Suda*, etc. However, the general aim of his book was the research on maritime commerce, and port terminology only receives the space of a short chapter. For instance, the author makes a classification of the Greek words into functional and geographical terms, and the latter are again divided into 'ports' and 'minor harbour forms'. His classification can be challenged after the findings of this thesis, particularly as Rougé barely quotes a few short passages and does not comment extensively on them. Also, the wider range of tools available nowadays facilitated the mass analysis of a large corpus of texts, something that can build on and expand Rougé's initial work.

2.4.5 The ports of Cyprus

Leonard (1995) carried out a similar study to this thesis, but limited to the ports in Cyprus. His paper investigates how the different texts name the sites and compares it to the physical features of the island. This author, however, offers translations of the terms, thus making assumptions as to what each harbour context implies with little justification. The model, however, is highly interesting for inter-textual comparison.

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[47] These are not taken into account in this thesis because of their marginality and because, as far as I am aware, this type of anchorage is not found in the literary sources referring to the Mediterranean.

2.4.6 Ports as complex adaptative systems

Preiser-Kapeller and Daim (2015) edited a multiple-author volume devoted to the analysis of maritime history within the framework of complexity theory. In this volume, an anchorage is understood as anywhere where a ship can be brought to a safe landing, be it by towing into the shore, riding at anchor, or mooring in a quay or jetty. This is regardless of human occupation and could depend on agricultural calendars. The interplay between environmental and social factors is discussed, with the influence of climatic events, and the lack of evidence for ancient networks.

A first paper discusses the human factors for the abandonment of the port at Thonis-Heracleion. The second contribution focuses on the issues regarding the finding of Byzantine harbours. This paper defines some of the terminology, in my opinion correctly except perhaps for ὅρμος/hormos. The work takes into account different factors in the development and history of harbours through the study of geographical and human characteristics of Late Antique – Byzantine harbours and their changing conditions. It emphasises the need for infrastructure, especially breakwaters, and the emergence of new ports close to important occupation centres.

The next paper reflects on the administration of ports, a topic for which data is extremely scarce. The final three works rely on network theory for the study of connections between ports.

2.4.7 Kowalski: the land seen from the seas

Another work consulted is that of Kowalski (2012), whose general aim is the investigation of maritime terms, particularly envisaging a reconstruction of the cognitive process of maritime landscape. However, the scope and methodology of his book is difficult to apply to the present thesis. Firstly, among the sources, it is based chiefly in Strabo and Ps.-Scylax, and therefore it is less of a generalising work than expected. This is a disadvantage due to the limited evidence discussed, and especially due to the textual problems in the transmission of Ps.-Scylax, and the fact that these are authors of very different date.[48] Secondly, the book works from translations and transliterations, there is barely any

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[48] Strabo: ca. 63 BC – ca. 23 AD. The voyage of Scylax of Caryanda is estimated to have taken place ca. 515 BC; the work attributed to him could date from the 4th century BC.

presence of Greek words in Greek letters in the appendix, which can lead to some misleading statements.

The author also contradicts himself in several parts of his book. The first section investigates the genesis of the texts, concluding that geography is written by people who had experience of travelling through the places described, be it on land or on sea, first-hand or second-hand. It also laments the lack of instructions on how to navigate (manoeuvring, coastal relief, etc.). The second part discusses "physical" investigations, devoting a very extensive amount of text to the precise meaning of the word ἀκρωτήριον. Other commentaries include how the navigation was structured around capes and landscape features visible from the sea, the effect of winds, the orientation by means of astronomy, the case of the islands. The third part of the book is devoted to the representation of geographical entities.

In the second part, Kowalski emphasises the vagueness of the vocabulary, bemoaning it several times. For example, Kowalski states (p.66) that one would be tempted to attribute the divergence in the employment of terms to a lack of lexical dexterity on the part of the authors, the majority of whom were not specialists in the field, or to a fundamental imprecision of the language. Although vagueness is a concept well researched in linguistics, one must not forget that, however vague the language needs to be, there have to be some minimum conditions so that things can be named in a certain way, and ancient authors, whether expert sailors or not, were native speakers of their langauges, whereas we are not nowadays.[49]

To solve this issue, my thesis investigates first the "minimum conditions" of words, and secondly – and more importantly – the pragmatic aspect. This "vagueness" so bemoaned by Kowalski could have more to do with the contexts and purposes in which the words are used rather than with their traits in a significate matrix. Kowalski's statement is also weakened by the fact that discussion of the original Greek texts is scarce. I believe this work does not provide substantial new information on the language, despite its appendix. Nevertheless, it is a fundamental work on the use of maritime spatial indications and the

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[49] Scholarly research on vagueness in language is vast indeed, and it also has a long tradition within semantic studies. Originally derivating from fields such as philosophy and psychology of the language (e.g., Russell, 1923), it is nowadays mostly a derivation from the fuzzy set boundaries theories arising from Labov's research shown in chapter 2 above, and it is oriented to solving practical issues (Smith, 2001; Cutting, 2007; Codish and Shiffman, 2005; Hersh and Caramazza, 1976; Christie, 1963-1964).

interpretation of maritime topography, as well as, like the subtitle indicates, the land seen from the seas.

2.4.8 Franzot and the Latin terms

In relation to the Latin language, Franzot (1999) prepared a study with a similar objective to this thesis, but researching Latin inscriptions relating to the port of Aquileia and other harbours. His work is divided in two parts, a first one with definitions and a second one with the analysis of significant inscriptions. Although his conclusions are in general correct, his chronological scope is not well defined and, consequently, somewhat misleading, especially if the reader is not skilled in Latin. For example, in Part 1 Chapter 1: *Le definizioni portuali*, we find some very rare ancient terms, such as *baiae*, together with medieval-looking ones like *plaga-plagia*, or even more rarely, Latinised Greek terms applied in Medieval times to western ports (*cataplus*). Because of this disorganised timeline, even though I will take into account his observations, the work of Franzot is not a key work of reference for this thesis.

2.4.9 General papers

Finally, to my knowledge there is not much modern research on the semantics of ancient harbour terminology, with the exeption of very specific works like that of Counillon (1998), who demonstrates quite convincingly that a λιμὴν ἐρῆμος (limen eremos) is an unprotected, rather than a deserted, port.

Some general papers on port descriptions have also been consulted. Oleson (1988) offers an overview of the elements and construction techniques that were expected for a port of the Roman Empire, with special attention to the construction of the artificial harbour at Caesarea Maritima. This paper offers a holisitic but simple review of the constructive elements of the port. In a similar way, Marriner et al. (2017) address the issue of the types of ports according to their geomorphological characteristics. After a catalogue of the data related to harbours, including archaeological evidence for structures from the Mediterranean to China, the authors establish a classification of the harbour basins according to their physical nature in the modern era. Marriner et al. classify harbours in the state that we can see them today as drowned, uplifted, landlocked, eroded, fluvial or lagoonal. The scope of this thesis is focused on the features of ports when they were still in

use, and therefore their paper is not particularly insightful for this thesis. However, the paper is certainly intersting for our understanding of the fate of the maritime complexes studied.

Finally, for the continuity of harbour structures, particularly in the Middle Ages and Byzantine period, as well as for fluvial harbours, the reader can consult the multiple ramifications of the project *Harbours. From the Roman Period to the Middle Ages* (http://spp-haefen.de/en/home).

2.5 Other topics of interest:
2.5.1 On the reliability of the sources
While the works discussed above address the terminology issue explicitly, a number of other studies provide valuable contributions in other aspects.

A first issue was to investigate whether the textual evidence is reliable and to what extent. Arnaud (2013) explores the truth conditions of geography writers, concluding that whether the texts that have come down to our days "tell the truth" depends on the credibility of their sources. Bear in mind that, contrary to Kowalski's statement above, most scholars were not writing from first-hand experience, but re-writing extant materials from their predecessors – who may or may not have visited the places in person. Thus, since 'credible' does not necessarily mean 'correct', Arnaud admonishes us to be still cautious with our use of the sources. However, he concludes, the role of the sources is of foremost importance to the good evaluation of the texts. This concept is of primary importance to this thesis, for my aim of investigating the relationship of literary texts or terms with tangible archaeological remains involves assessing whether the sources are reliable.

2.5.2 Bresson and Rendall's emporion
Ports are, indeed, structures with physical uses: sea communications, trade and defence, amongst others. In this sense, it was interesting to seek information on these aspects. Recently, Bresson, in collaboration with Rendall (2016), has published an updated version of his book on the Greek economy. The book is divided in two parts. First, the structures and production systems are analysed, and secondly, the authors provide discussion on the market and trade. One of the book's chapters is specifically devoted to the

ἐμπόριον/emporion, which is discussed in section 4.3 of this thesis. Their coverage is very complete, encompassing a wide range of topics from demography and birth control strategies to juridical practices, from the Archaic era to the Hellenistic period. The contents are insightful and exhaustive, although not all of them are of relevance to this thesis, since the chronological focus here is the Roman period. However, the frequent comparisons with situations and practices in the Middle Ages and the early modern period are highly illustrative. As with other works discussed, a substantial criticism that can be made, however, is that the authors do not show most of the texts they discuss, but instead paraphrase the contents. Where they do show the texts, these are always in translation. There is also no presence of Greek words except in transliteration. This causes confusion in some occasions, most notably on pp. 396 ss., where the authors comment on the Greek word *didonai* from a text that they have shown only in translation, in consequence the reader has no chance to know what part of the text they refer to. A final criticism is that in some cases the authors make statements that are left unexplained and are not fully substantiated. In spite of this, Bresson and Rendall present a very detailed overview of the trading procedures, the staff involved, the juridical structures, the prices, the interrelations between several city-states, and, in short, all aspects relating to the economic and commercial spheres. Thus, despite its formal shortcomings, this work is a fundamental manual on the ways of commerce in the ancient Greek world.

2.5.3 The users of the ports

While the main aim of this thesis was not the investigation of the human activity in the ports, I have also sought some studies on the users of harbour installations in order to better understand the vocabulary that I am researching.

The study by Knorringa (1927) discusses the various functions and connotations of the Greek vocabulary for traders and trade. The book provides a valuable catalogue of data, including attitudes to the craft of trade, the goods that were being traded and their qualities, the characteristics and status of sellers, organisation of the market, the relations with piracy, etc. Professions related to the commercial procedures of the ἔμποροι/emporoi are also discussed, most notably the ναύκληροι / naukleroi, the ἀγορανόμοι / agoranomoi, the ἐπιμεληταί / epimeletai, and the τραπεζῖται / trapezitai. However, due to the nature of the sources, most of the data is based on the situation in Athens. It is an excellent study,

although for a period much earlier than that in this thesis, and therefore, Knorringa's work has only been consulted as a support material.

Similar works dealing with commerce and commercial ports are those by Vélissaropoulos (1977), who offers a concise account on the jobs and tasks that had to be performed in the ἐμπόριον/emporion, McCormick (2001), and Tchernia (2011).

Together with trade, harbours can also be used for military defence. Reddé (1986) in his book about the military harbours of the Roman Empire devotes a chapter to the description of the ports, albeit barely quoting very few ancient sources, whether literary or epigraphical. Hopkins (2014) researches the imperial properties around the military harbours of Misenum and Ravenna, establishing direct relationships between the imperial dinasties and the military bases.

2.5.4 Non-Mediterranean ports

Although this thesis investigates ports in the Mediterranean sea, it was interesting to consult some bibliography on fluvial ports for comparison. A recent book on the subject is the work by Wawrzinek (2014). Her study takes into account both fluvial and maritime ports, but focusing on the rivers. Her work is focused on the archaeology, using as base material the published reports of excavations. Wawrzinek (2014 : 18) laments the difficulties of translation from other languages (those in which the reports are written) into German. She also states that in many cases she could not verify the statements in these reports with maps or photographs.[50] This is a major problem, but it is to her credit that she made it known. However, she uses well the sources that she does have, and is highly aware of the limitations of the texts. In chapter III, devoted to the installations and organisation of the ports, the author concludes that there exists a "Mediterranean type" of quay, as opposed to those in the rivers in central and northern Europe. She also concludes that there are no clear distinctions between civilian and military ports or port zones, although in a small number of cases it is possible to distinguish a certain area in the port which has been fortified. The author deals also with the commercial infrastructure and the ties with the Hinterland of

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[50] In my opinion, this is a major flaw. It is obvious that languages do not map exactly onto one another, a fact voiced in Academia since the age of Saussure. Because of this, one should avoid working with translations. In addition, the function of the remains is usually interpreted by archaeologists, e.g. a certain structure may be a breakwater or a jetty or a wharf, etc. In addition, the fact that she could not double-check the data worsens the issue, as it makes the use of the terminology the more inconsistent.

the river ports in chapter IV. The work also provides rich appendices with data on the ports. There is also an appendix on textual sources (literary and epigraphical) but rather short.[51] The author herself states (2014 : 202) that the general ancient literature about seafaring is barely useful for the research on the continental navigation (i.e., in rivers or lakes).

Arnaud (2016b) has also published a contribution to the subject of fluvial ports. He highlights the importance of ports situated at the mouths of rivers, and of rivers being used as if they were canals, granting access to major cities inland. He notes the cost of using those, especially when sailing upstream. Arnaud also notes the constraints caused by the relatively small sizes of these river-mouth ports and how to solve them. Finally, he devotes an interesting last section of the paper to the interaction between fluvial and maritime environments.

2.5.6 Bibliography on port structures

Finally, some information on the physical structures also proved valuable. Frost (1972) offers a good account on the types of harbours that may have existed pre-dating Graeco-Roman constructions. From her paper, it becomes clear that further research is needed into the primitive forms of ports or anchorages, especially in regards to dating the structures. However, the paper rejects the assumption that the first ships were small and were always beached. Indeed, there is evidence that even proto-ships may have been of great capacity (either for cargo or for towing, this remains an open question), and two modalities of port seem to stand out. Firstly, there were the facilities cut into rocky coasts. These include quays by flattening rocky tongues of land, and also shelters from the weather, by leaving a "wall" of rock in the background. Other arrangements, such as warehouses or fish tanks, would have also been cut in the rock. The second modality of anchorage appears to have been on reefs on the open seas, judging by the quantity of anchors lost at sea. This would have been due to adverse winds, so that the ship would have had to stop and wait for better weather conditions. This study is a good summary on proto-harbours and helps us better understand the evolution in relation to the port forms that came next in Greek and Roman times. Since her work does not deal with Graeco-Roman literature and vocabulary, it

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[51] The literary appendix is also inconsistent, as the texts are sometimes translated into German, others into English and in a few occasions are left untranslated.

could not be wholly incorporated into the body of this thesis, but it offers an excellent starting point on the perspective of the physical remains.

Blackman (1982 a and b) wrote two fundamental papers on Graeco-Roman harbours. In these papers, he lists the available evidence (literary, pictorial, etc.), and names its advantages and flaws. He also reviews the most relevant studies up to date, including reports of excavations. It is a great exposition of data and a foundational milestone in harbour research, although it provides no new discoveries. In the second paper, Blackman explains in a rapid exposition the technical advances and functions of the port, as well as enumerating various architectural elements (e.g. quays).

Another relevant concern is how and why people travelled from place to place in the first place. In this sense, the paper by Salway (2004) furnishes a concise review of the literature describing itineraries. He compares Greek and Latin sources and shows that the latter are far less precise: Latin itineraries list distances from one place to the next, and they do not elaborate on the types of anchorage. His data is mostly beyond the chronological scope of this thesis, but the point still stands. Indeed, throughout the study of the literary texts examined here, it can be safely stated that Latin sources are far vaguer and less rich than their Greek counterparts. However, the situation is not that simple. We must take into account that the Greek literary works examined by Salway were well-established genres by the time their Latin counterparts appeared. The *Stadiasmus*, for example, when it was first written in the 6th century BC, provided only the most basic indications. It was only in subsequent revisions, especially in the 2nd century BC, that it acquired many of the details that we can read nowadays. The author states (2004 : 43), the sense that the Greeks were masters of the sea and the Romans of the land, which is generally true in the state of the texts that we can read nowadays, but not when we take into account the evolution of textual sources. It is because of this reason that this thesis will not attempt a comparison between Latin and Greek literary forms, and will only be focusing on the semantic content of the terminology.

In conclusion, the problems with the existing literature can be summarised in three main points. First, in most cases, modern scholars do not take into account the ancient texts or barely provide references without direct quotes. Second, the research on port terminology

is never comprehensive, in that it is focused in one specific aspect or geographical area. Finally, none of the works reviewed addresses systematically (if at all) the ontological issues of language, i.e. the use of language in a pragmatic context. There is, indeed, a gap in the research in its current state: inconsistencies in the archaeological literature are caused by and not solved with an effective analysis of the ancient textual sources, and in this aspect the linguistic literature is also to blame, as it does not take into account the uses upon tangible realities of languages nowadays extinct.

3. METHODOLOGY

3.1 General outline

As explained earlier, the working methods for this thesis are twofold, in that it deals both with linguistic and archaeological data. The texts will be taken as the substitute for speech acts in modern research, in order to work out the features of the idealised prototype for each port. Each term will first be studied in isolation. Next, the validity of the theoretical inferences will be verified against two case studies. This will constitute the analysis of the data at a theoretical and practical level. In the next phase, discussion will be provided about how to integrate and organise this data within general linguistic research (i.e. decomponential analysis and hierarchical taxonomies), as well as presenting those ontological aspects that may result more complex in the delimitation of word boundaries. Finally, some conclusions will be presented.

Typical semantics studies, such as those that Labov (1972) first designed, are based on concrete speech acts (pragmatics). These experiments consist of a significant number of participants being shown a series of artefacts or photographs and being asked to name them. Some of the artefacts will have a more prototypical form, whereas others will have characteristics more or less aberrant from the norm. The agreement, or lack of, in each case is what determines the semantic features in the matrix of every word. From this point arose the discipline of Cognitive Linguistics, the aim of which is to identify prototypes and classify them into categories, and through these categories unravel the mechanisms of semantics and speech.[52]

Due to the obvious lack of native speakers of Ancient Greek and Latin, this was not a viable method for me. Instead, we have been left with significant written records from antiquity. These writings will be examined in place of the speaking volunteers in order to provide the components of the lexical analysis.

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[52] For an introduction to Cognitive Linguistics, Ungerer and Schmid, 1996.

3.2 Analysing the data

The first step is to find the ancient texts with mentions of harbours. As a starting point, one can recur to the modern research and list the relevant terms. The words that Rougé (1966 : 107-119) classifies in his book are reflected in Figure 6 :[53]
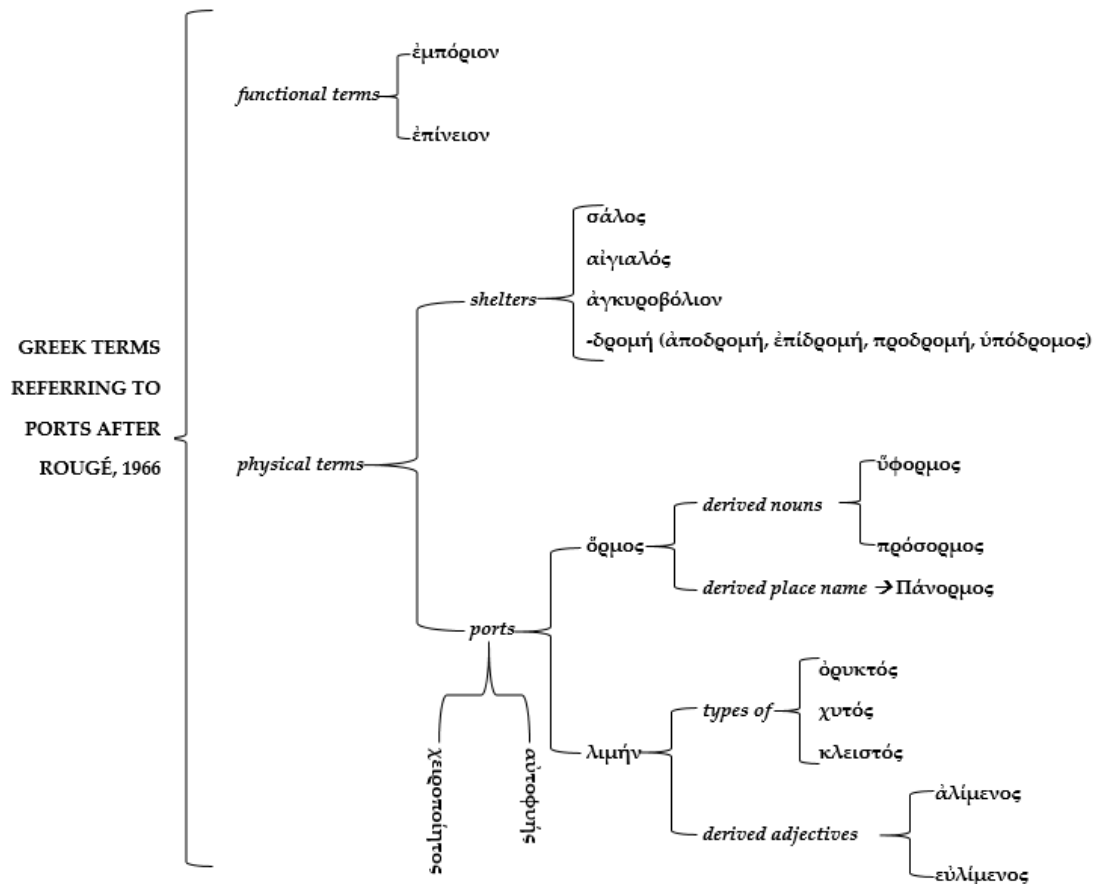
Figure 6. Greek harbour terminology after Rougé (1966).

The next step was to sort out the terms that are relevant for the scope of this thesis, i.e. those relating to the Mediterranean area and used during the Roman Imperial age. Therefore, the derivates of −δρομή have been removed, because those words only appear rarely and in sources not related to the Mediterranean, specifically the *Periplus Of the Red Sea*. On the other hand, one more word was taken into consideration: ναύσταθμον/naustathmon. It is documented in the context and era that fall within the remit of this thesis. Latin terms include mainly *portus* and *statio*, although transliterations of Greek names, such as *salum* or *naustathmus*, appear occasionally. Some geographical

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[53] I would like to emphasise that this is a diagram that I made based on the text of Rougé. The diagram reflects his conclusions and not my own.

entities, e.g. *sinus* or *ripa*, might have been added to the list, but the literary documentation in those cases is rather scanty, and it was not feasible to include those within this PhD. A special case is that of the ports on rivers or at river mouths. River mouth locations are more advantageous geographically, but sometimes a port at the river mouth, near the confluence with the sea, was only a "foreharbour" connected to a bigger centre some distance up the river (e.g. Strabo, 6.1.5 and 6.3.9; cf. Arnaud, 2016). River ports are not the object of this thesis, they will only be discussed in those passages where they can provide insightful details.

Once these words were selected, it was necessary to search for them in the *Thesaurus Linguae Graecae* (*TLG*) and the *Packhard Humanities Institute Latin Corpus* (*PHI*). Searches for these keywords produced hundreds, sometimes thousands, of results. Consequently, only relevant materials were used, i.e. those providing positive data, not just place name lists,[54] and that fall within the scope of this thesis (see 3.3 for the limits set to the data). These tools were very helpful in order to speed up the work, as I could quickly find the passages that were relevant, and thus read the key sections in the full editions straightaway.

While classifying the materials, some recurrent authors and concepts stood out. These were read very carefully in order to note both what they have in common and the differing information that they provided, especially in the *realia* perspective (geomorphology, natural / artificial structure, facilities, authorities, and so on). The passages were all useful in drawing comparisons between port types. While literary genres were not as clear-cut as nowadays, what we would term as historians usually provide far more details than the geographers' lists of place names devoid of further comment. Roman historians, on the contrary, provide little information, as their focus of attention is on the events, rather than the places. History is considered a didactical genre, and what most of the Roman scholars wanted from it were *exempla maiorum*, i.e. models from their ancestors.[55] The physical milieu where the events took place was rather secondary. I would also like to emphasise that, in any case, whenever we have descriptions of ports in writings, it is usually because

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[54] Cf., for example, Strabo, 5.2.6, where he explains that the town of Poplonium is deserted, but the port is still inhabited and active, and that it has a lookout for fishing tunnies. By contrast, Strabo, 6.2.5 is little more than a list of Sicilian towns with barely a few historical notes. Pliny the Elder usually only provides the names of towns in chronological / spatial succession.

[55] Stemmler (2000).

those ports are "out of the norm".[56] The expectable generally goes unnoticed, and it is the unusual that stands out and is considered worthy of mention.

All the relevant data, once found in *TLG* and *PHI*, were entered into three of the Portus Limen Project databases.[57] The books' database records basic details such as authorship, work title and language. The database entry for passages indicates its context, the date of the events (if relevant or known) and the prosopography available. Finally, the words database classifies the key items related to the port. The three databases are also being merged into one for ease of consultation to the philologically trained user. This set of databases becomes especially practical in order to find passages quickly, or to look for a specific content within the results of a specific word or place. For example, in order to find all passages where Pausanias mentions an ἐπίνειον/epineion, one can use the books database and search for Pausanias, then all his passages and words will deploy on one side of the screen. We can click on the option to view all words and perform a second search within those specifically for ἐπίνειον/epineion. Otherwise, if we wished to find the word ἐπίνειον/epineion in any work, it will suffice to perform a search in the words database. When clicking on each "word" option, tabs deploy with information about the book and passage related to it. This is a sample of the databases (Figure 7):

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[56] Arguably, the description of ports could serve aesthetic purposes, by "filling in" rethorical space. Let us not forget that authors could praise or deride a city by means of describing its infrastructure, including ports, as better or worse quality, as the manual by Julius Pollux also shows.

[57] The databases are not yet in the public domain. For the purposes of this viva, though, a guest password has been created (see above, accompanying materials).

Books

[Edit]

Book ID	006
Author Name	Diodorus Siculus
Book Name	Bibliotheca Historica
Language	Greek
Genre	history
Added	04/03/2015, 11:10:41 (Núria Garcia Casacuberta)

Passages

[Edit] [Revisions]

Book ID	002
Passage ID	002_029
Passage	1.24
External link	http://www.perseus.tufts.edu/hopper/text?doc=Plb.+1.24&fromdoc=Perseus%3Atext%3A1999.01.0233
Text date (earliest)	200 BC
Text date (latest)	118 BC
Text Chronological indicators	Life of the author
Text generation	pre-existent sources
Events recorded	naval battles between Romans and Carthaginians in Sicily.
Date of the event (earliest)	mid-3rd century BC
Date of the event (latest)	mid-3rd century BC
Event Chronological indicators	historical event
Prosopography available	Hamilcar, commander of the Carthaginian land forces; Aulus Atilius and Gaius Sulpicius, Roman consuls
Added	03/02/2016, 11:53:47 (Núria Garcia Casacuberta)

Word	portus
Modern country	Spain
Text toponym	Carthago Nova
Quantity	1
Geographic and topographic informations	in a favourable situation for the passage to Africa
Function or activity	mooring
Comments	The port of New Carthage is large enough for a big fleet. Livy believes it is the only port in Hispania that faces "their" sea.
Verb used	sitam
Modifiers: quality	satis amplum quantaevis classi
Quality modifiers category	adverbial phrase
Quality modifiers syntactic funcion	adverbial clause, noun complement
Modifiers: vectorisation	super portum satis amplum quantaevis classi
Vectorisation type	locus ubi
Vectorisation modifiers category	prepositional phrase
Vectorisation modifiers syntactic funcion	adverbial clause
Indication of port: word category	noun phrase
Indication of port: syntax	accusative dependent on preposition
Syntactic indication of port quote	portum satis amplum quantaevis classi
Indication of topography: word category	noun: toponym | noun
Indication of topography: syntax	accusative, direct object | accusative, apposition to toponym
Syntactic indication of topography quote	Carthaginem Novam | urbem
Added	19/04/2016, 15:16:45 (Núria Garcia Casacuberta)

Figure 7. Samples of literary data from the Portus Limen databases

Following the examination and classification of the words, I identified the leitmotifs and recurring information. During this process, I also noted the main ontological clashes, such as passages referring to the same space by two different terms. These passages will be commented in the discussion (section 6), after the analysis of both the texts and the physical evidence of the case studies, in order to verify how the singular terms relate to one another.

At this point, I would like to remind the reader that all the translations for this thesis are my own.[58] As noted in section 2, one of the main issues with publications up to date is that they fail to quote the texts directly. Apart from this not being an ideal method when dealing with lexicology, paraphrasing of the data is not good academic practice, as sources should not be manipulated, but used transparently and in their full extent. Therefore, I hope I can provide a good contribution by offering all relevant texts in the original languages, with translations kept as literal as possible for the help of those who do not master Greek or Latin. The terms researched have been only transliterated in order not to add connotations belonging to modern languages.

I have devoted the second part of the analysis to case studies. After presenting all the relevant passages, mentions of specific and well-known places (Alexandria and the south of Italy) have been sought. These places will be used to present how the abstract words reflect in the physical reality. In this sense, the archaeological data will contribute to expand the information found in the texts by documenting the specific physical structures.

3.3 Selecting the appropriate sources

Despite the fact that only a limited number of sources are extant, there was not sufficient time to consult every single ancient work, meaning that choices had to be made. Furthermore, not every text is suitable for this kind of research. As Lucian wrote, ποιητικῆς μὲν καὶ ποιημάτων ἄλλαι ὑποσχέσεις καὶ κανόνες ἴδιοι, ἱστορίας δὲ ἄλλοι.[59]

The scope of the project includes both Greek and Latin literary materials related to the Roman Mediterranean harbours.[60] The timeline of the Portus Limen Project, of which this thesis forms part, is set between the 1st century BC and the 3rd century AD. However, most of the historical literature from that period narrates events from the time of the Punic Wars,

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[58] I have often found paraphrase in the translations available to date, not to mention occasional mistakes. I decided, therefore, to make my own translations so I can keep the English version as close to the original as possible. Please note that due to word limit constraints, texts and translations for this thesis had to be supplied in the appendix.

[59] Luc. *Hist. Conscr.* 8: *poetry and the art of poems have a set of principles and specific rules, research has different ones.*

[60] It is not my aim to discuss the geography of the Mediterranean basin. For details on this subject, I recommend Woodward (2009), Bethemont (2008³) Tabeaud, Pech and Simon (1997). For the relationship with the ancient literature, see Cary (1949).

and is based particularly in Polybius. Therefore, I am starting my timeline with the Roman expansion into the Mediterranean (i.e. in the time of the Punic Wars of the 3rd and 2nd centuries BC), in order to include the accounts of Polybius, as he is the first-hand source for a number of other authors. As for the end of my timeline, I include Procopius (6th century AD), since this author provides valuable information about the fate of ports right after the fall of the Western Roman Empire. Medieval lexica and scholia have only been taken into account when they provide insights into the meanings of classical texts. In addition, occasionally, sources outside this period or the Mediterranean geographical area (e.g. relating to the Red Sea, the Arabian Gulf, India) have been referred to if they provide relevant data.

Some words need to be added about the overall choice of texts. The first step that I undertook was to perform searches in the standard databases to find what texts containing the terms of study are extant. Among these, a stricter selection was made in order to keep only the texts that fall within the remit of this thesis (from Polybius to Procopius). However, some medieval compilations, like the *Suda* or Servius's comments on Virgil, and scholia were accepted where relevant for the etymology sections. Those medieval commentaries are worth taking into account as historical comments.

Due to the focus of this thesis, obviously the primary materials to use were geographical writings, like the *Stadiasmus*, Strabo, Pausanias, or Pliny the Elder. This thesis aims to describe the physical qualities of ports, and geography authors naturally concentrate on the characterisitcs of each site. However, there are few such authors.

The largest body of evidence is that of the historians. Historical accounts have been considered because their descriptions of the landscape, when there are some, are written with a sense of neutrality. While the texts focus on the events, rather than on the scenery, a priori history authors do not intend to modify the features of the landscape, and can be considered reliable.

Technical treatises, like Procopius's *On Buildings* and Vitruvius's *On Architecture*, have been read, but unfortunately the information that they offer on the features of ports is rather limited. The same is true for the majority of fiction texts. For example, in Plautus's comedies, most of the times the only reference to ports is when a character enters the scene and says that they come from the harbour. The Greek novels are slightly more promising, especially *Callirhoe*, but most of the times they only mention the term λιμήν/limen, and

not the others. To sum up, the texts selected for this thesis are generally limited to the evidence that is extant.

However, note that the genre differentiation is a modern concept. Even artistic literature in Antiquity could be taken for technical manuals, for example in the description of Odysseus's raft in Homer, *Oddyssey*, 5.228 ss.

Two key issues that emerged, however, concerned the chronological difference between when events happened and when they were narrated, and by whom. Diodorus Siculus, for example, provides quite abundant information on Dionysius, the tyrant of Syracuse who lived ca. 430-367 BC.[61] Similarly, sometimes Strabo refers to events dating back to the Persian Wars (499-449 BC), if they took place in the locations that he is describing. Should that exclude these authors from the present thesis? I believe not. The reason is that, while the events are certainly more ancient, the authors are not (Diodorus Siculus: ca. 90-30 BC; Strabo: ca. 64-24 BC). Therefore, what has been preserved is the narrative in the language that would have been used during the time of the authors, i.e. within the established timeframe for this thesis. Note also that, had the texts been written in the age when the events took place, there is a great chance that some of the terms would not be documented, and in particular ἐπίνειον/epineion and σάλος/salos: one only needs to compare with the periplus of Pseudo-Scylax (claiming to be 6th century BC, but date disputed)[62] and with Herodotus (ca.484 - 430/420 BC), who use these two harbour terms only very rarely, if at all.

Contrarily, one could argue for the inclusion of authors like Thucydides (ca. 460-400 BC) or Demosthenes (384-322 BC),[63] in that the terminology that they use is more "modern" and because, like the authors selected in this thesis, they generally employ a similar form of neutral Ionico-Attic koiné Greek.[64] However, as noted above, limits need to be set in order to keep the thesis feasible, and the focus has been placed on those ports that the Romans had relationships with. Because of this, authors like Thucydides or Demosthenes are only adduced where appropriate as supplementary evidence.

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[61] Hornblower et al. (2014) s.v. *Dionysius I.*
[62] Dear and Kemp (2007²), s.v. *periplus, or periplous.*
[63] For the authors quoted: Gagarin (2010), ss. vv. *Diodorus Siculus, Strabo, Herodotus, Thucydides, Demosthenes*
[64] For a complete discussion on the history of Greek language, its dialects and its standarisation into a koiné dialect, see Horrocks (1997), particularly chapters 1, 2, 3, 4, and 6.

Needless to say, all ancient texts have been read in their original languages, Greek and Latin. I have been using in a first instance the editons available by the well-reputed sites of *TLG* and *PHI*. These are mostly transcriptions of the only philological editions available (usually those published by Teubner, sometimes Loeb or Les Belles Lettres)[65]. In the cases where more than one edition is available, preference has been given to the Teubner and Oxford editions, due to their quality and known scholarly rigour.[66] However, once the materials were identified, I have contrasted them with the print editions, as online editions do not have an apparatus criticus reflecting the textual variants.[67] Translations and commentaries have been taken into account where relevant. Nevertheless, all the translations provided in this thesis have been written by myself to ensure an adequate context in regards to the preceeding, unquoted text, and keep the result as close to the original as possible (too often modern translators tend to paraphrase, so that the message looks more natural in the modern language). Another advantage of making my own translations was to maintain consistency throughtout the work, rather than rely on different styles and vocabulary. The words that are the object of this thesis have been transliterated, not translated, as translation implies a series of assumptions in the target language that must not be made: languages do not map exactly onto one another. Transliteration is also a visual aid to the reader, rather than providing a translation that the reader unskilled in the Classical languages cannot know what it corresponds to.

Among the vast amount of literature that has survived, a difference must first be established between those texts which genuinely aim at providing information (at least to the best of their possibilities, as in the case of geographical or historical accounts), and fiction. Of course, in the prose genres, the narrative techniques employed are the same, or very similar,

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[65] An issue worth taking into account is that the texts object of this thesis have a whole tradition of their own. It is rare when we have texts depending on a codex unicus, like the Stadiasmus, or whose extant manuscripts all relate to a single, lost codex, like Strabo's Geography. For example, Pliny the Elder has been preserved in a number of manuscripts dating back to the 5th century onwards. Manuscript tradition, not to mention modern editions, can present divergent variants. To simplify this thesis, the textual variants have only been taken into consideration where relevant.

[66] In the choice between Teubner or Oxford Classical Texts, some of the volumes of the latter are more recent than Teubner's, but it focuses mainly on poetry, oratory and philosophy for the Greek part (i.e. historians and geographers from the imperial age are missing), therefore the only choice possible was Teubner. On the Latin side, though, the Oxford publications acquire a more relevant weight, as they have published many of the historiographical works. On a particular note, I have used the edition of Strabo published by Meineke. I am aware that there is a significantly more modern edition, Radt (2002-2009), but I did not have access to it on a regular basis, therefore coherence had to be prioritised above modernity. Meineke's edition is also the version adopted by *TLG*.

[67] I would like to add that *PHI* does not reference its editions at all, so in the case of Latin, a comparison with a reliable print version was mandatory.

especially if the author wants to convey a truth-like sensation to the reader. It is also true that in many occasions, "reality-based" writers, such as geographers, reproduced legends because they believed them to be historical facts. This is especially true in the case of *aitia* ("causes"), e.g. explaining the foundation of towns.[68] The *Oxford Dictionary of Literary Terms* defines the word *fiction* as[69]: «The general term for invented stories, now usually applied to novels, short stories, novellas, romances, fables, and other narrative works in prose, even though most plays and narrative poems are also fictional. The adjective fictitious tends to carry the unfavourable sense of falsehood, whereas 'fictional' is more neutral, and the archaic adjective fictive, revived by the poet Wallace Stevens and others, has a more positive sense closer to 'imaginative' or 'inventive'». A similar classification is proposed by Quintilian, *Institutio Oratoria*, 2.4.2, where he distinguishes three literary genres: theatre, history and poetry. Quintilian classifies history as "more solid" and "more truthful".[70]

Therefore, in this thesis I shall be classifying as "fiction" any narrative that has been intentionally invented or is well known not to be true because it forms part of a mythical past. However, fiction cannot be wholly discarded, as some of the fiction narratives, such as the Greek novels or Plautus´s plays, still intend to convey verisimile situations. Below I shall discuss the difference between *plasma* and *mythos*, but the verisimilitude aim of the texts is worth considering when dealing with the literature.

On the contrary, I labelled as reality-based accounts all those that are not intentionally made up and intend to reflect facts and actual features of the land, either because the author witnessed them himself or because he re-used works which he considered to be worthy of trust. Reality-based narratives are not completely fiction-free (in this sense, the

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[68] Just to quote a couple of relevant examples, Pausanias, 2.32.9 states that Theseus is believed to have been born in a place called Genthelion ('birthplace'), which is located near Celendreis. Similarly, Strabo, 8.3.26, reproduces a myth about the return of Telemachus and his companions from Sparta, to justify the physic location of the Homeric kingdom of Nestor.

[69] The *Oxford Dictionary of Literary Terms*, s.v. *fiction*.

[70] Quintilian, *Institutio Oratoria*, 2.4.2: Et quia narrationum, excepta qua in causis utimur, tris accepimus species, fabulam, quae uersatur in tragoediis atque carminibus non a ueritate modo sed etiam a forma ueritatis remota, argumentum, quod falsum sed uero simile comoediae fingunt, historiam, in qua est gestae rei expositio, grammaticis autem poeticas dedimus: apud rhetorem initium sit historica, tanto robustior quanto uerior; « Indeed, we recognise three kinds of narrations, except for those that we use in judicial causes: [first,] theatre, which is divided between tragedies and poems; not only are they not derived from truthful events but their form is far away from the truth. [Secondly,] the plot, which is false but produces plausible comedies. [Finally,] history, which is a presentation of achievements. We attribute the poetic works to the teachers of grammar; but the rhetor has to start with historical facts, the more solid the more truthful».

same Quintilian notes that history is "close to poetry")[71], but these occasions are usually detectable within the works that do not aim to create a fabricated story.

Nevertheless, both genres have to be dealt with with the greatest caution. On the one hand, in the case of fiction, the main issue is rather obvious. It is the fact that the purpose of the text is not to supply the public with practical, authentic information but to make them laugh or cry, provoke admiration for someone, etc. Notwithstanding this, not all fiction works can be treated in the same way. A clear distinction must be made between *plasma* and *mythos*,[72] that is, between fiction literature that intends to reflect reality, and utterly invented environments. Plautus, for instance, belongs to the *plasma* authors, as his comedies are not real events but the background situations in them are credible and understood by the actual audience,[73] whereas Phaedrus writes about completely mythical topics.[74] This does not imply that we must reject some works and keep others, it is only a matter of how much caution has to be exercised with interpreting each text.[75]

A special issue is that of the travel narratives. The *Argonautica* by Apollonius of Rhodes, the novels (the works by Longinus, Heliodorus, Achilles Tatius), or even Lucian's *True Stories*, all depict voyages by sea. The contents of these stories are sheer fiction, as Lucian makes very clear: ἓν γὰρ δὴ τοῦτο ἀληθεύσω λέγων ὅτι ψεύδομαι – 'I will tell the truth in one single thing: that I am lying'.[76] In spite of this, travel narratives still contain some kind of background truths, and seek to describe realistic scenarios when they refer to ports. The reader may wonder what is the difference between the journeys in the novels with the *periploi*. The key concept is the purpose of the text. Whereas the intention of the *periploi*

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[71] *Institutio Oratoria*, 10.1.31: *Historia […] est enim proxima poetis, et quodam modo carmen solutum est, et scribitur ad narrandum, non ad probandum, totumque opus non ad actum rei pugnamque praesentem sed ad memoriam posteritatis et ingenii famam componitur: ideoque et verbis remotioribus et liberioribus figuris narrandi taedium evitat.* "History is close to poetry, and it is somehow disclosed as a poem, and it is written for the narration, not the demonstration, of a whole event, and not for the current affair and war, but for the remembrance in posterity, and it is composed for the glory of its author: thus, it prevents the repetitiveness of the narration with ancient words and rethorical figures."

[72] Arguably, a very early historian like Herodotus could be included among the *mythos*-authors, as he usually makes use of legendary data for the more remote times or places for which he has no other information. This is not a worry for the purposes of this thesis as Herodotus is too early an author.

[73] E.g. *Stichus*, 2.2, where Pinacium, whom Panegyris had sent to the port, enquires with the customs officers before seeing Panegyris's husband with his slave arriving in a ship, thus implying that these officers had a good control on people accessing the harbours.

[74] In spite of some veiled criticism to his contemporary society. See *OCD* s.v. *Phaedrus*.

[75] In fact, ancient geographical texts depended on whether they were perceived as credible. See Arnaud (2013). For further literature on the issue of fiction, see: Lamarque and Olsen (1994). Although these authors understand literature as no-truth, they explore the limits of fictionality and its relation with truth.

[76] Lucian, *True Stories*, 4.

is to document the features and facilities at each site, the focus of the travel narratives is in the adventures of their protagonists, and therefore ports (like the rest of characteristics of the landscape) are only taken into account inasmuch as they act as theatres for events. Some of these "theatres" intend to be realistic (i.e. *plasma*, as in the Hellenistic novels, for instance), while others are wholly made-up, and therefore *mythos*, like Lucian's *True Stories* or the Atlantis description in Plato's *Timaeus*.

Historical texts should also undergo similar scrutiny of their reality. In the case of the Greek historians, the problem is that some of the events reported are far too ancient to have substantial evidence of, and therefore rely on legends or notices passed down the generations orally, with the subsequent distortions. In the case of the Latin writers, history was viewed as a didactic genre, i.e. as the means of offering models of virtue and behaviour, and thus, the places where the events happen are usually not described very accurately.[77]

On the other hand, some technical literature can be potentially troublesome when the final text is not a creation of the author himself. Let us compare, for instance, Caesar and Strabo. It is obvious that Caesar did narrate the events as it best suited him, so there is a certain "deformation of the truth" (e.g. exaggerating deeds or altering the chronological sequence of events). But Caesar narrates events that either he himself had seen or that his generals directly informed him of, so his accounts on the *Gallic* and *Civil Wars* offer a high level of reliability and generally credible evidence.[78] Strabo, on the other hand, was a native of Amaseia, on the Black Sea. He exhibits good knowledge of the eastern Mediterranean and one can be fairly sure he travelled to different places, including Rome.[79] His description of the city of Alexandria in Egypt is remarkably accurate and exceptional (17.1.6 ss.), as he

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[77] For further discussion, see: Duff (2003). Marasco (2003) edited a book on a similar topic, but its contents seem to be quite flawed.

[78] The bibliography devoted to Caesar up to date is vast (see the suggested studies under the bibliography section), but for a good introduction, see Mayer (2011). Some of the relevant observations made by this scholar are the following: p. 208: «some have claimed to discern, perhaps not unjustifiably, an alteration to the order of events, which in principle did not affect their veracity independent of this». According to Mayer's discussion, Caesar may have altered the "natural" narration of events for the sake of persuading the readers to a certain morale point, but the elements of the physical reality are with high probability reliable. On the *interpretatio Romana* (i.e., the fact of transferring characteristics or objects of other peoples into Roman concepts), p. 206: «the phenomenon has been seen as a way of masking the truth or manipulating it, although at the present moment it tends to be seen as a Roman way, well documented in other sources, of understanding an alien concept and making it their own».

[79] Strabo was born in Amaseia: 12.3.15, 12.3.39; educated in Asia Minor: 14.1.48; visited Rome 6.2.6; saw Corinth looted: 8.6.23; travelled across the Aegean: 10.5.3; travelled up the Nile to Aithiopia: 2.5.12, 17.1.24; travelled from Armenia to Tyrrhenia and from the Euxine to Aithiopia: 2.5.11-12; Cappadocia: 12.2.3; travelled from Asia Minor to Rome: 6.3.7. See Easterling and Knox (1989).

lived in this city for a period of time. However, in some cases, such as his books on Iberia (book 3)[80] or India (book 15), he was simply re-writing extant literature. It is suspected that he may have been re-writing even in those cases when he had seen the places himself. This is problematic as regards potential geographical mistakes. Naturally, these issues must be taken into account but due to all the constraints of what literature can actually be traced back, I believe it is best practice to restrict the analysis to the sources that we are able to read nowadays.

The problems do not end there, though. In an excellent paper, Horsfall (1985) demonstrated that geographical descriptions are subject to literary models. He focuses on the analysis of Livy and Virgil in particular, collating them with sources like Menander Rhetor, who gives instructions on how a harbour should be described (and praised). However, Horsfall (1985 : 201) points out that the fact that while Pliny the Younger had learned a certain literary model from his rhetor, which he applied, this does not mean that he was not describing a real place. In fact, his description of the port of Centumcellae, which he did see (*Letters*, 6), seems pretty accurate compared to the physical evidence, particularly the island. Horsfall (1985 : 206) concludes that one must always bear in mind the linguistic and literary conventions mediating the transmission of information from the real world.

This thesis will only deal with major sources that survived to our age. The search for lost literature[81] would be extremely complex. It would be necessary to look for the same passage in multiple authors and make sure that they have not copied passages from one another but had derived them from a common, unpreserved source. Or else, if the passage has only been preserved in one extant text, researchers would have to be able to demonstrate without doubt that the extant author cannot have been the original writer of the paragraph. Even in this case, the name of the lost author might not be attributable with certainty. On the contrary, a number of times we do have the names of the lost authors (e.g. Posidonius or Eratosthenes, all quoted by Strabo), but this does not mean that we have their exact words. Therefore, the use of literature that is not preserved was too great a challenge for this thesis.

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[80] For a study on the sources of Strabo's third book on Iberia, which he never visited in person, see Morr (1926).

[81] On the causes of the loss of literature, see Stoneman (2010).

In addition, lost literature causes a major problem for modern researchers: when there is an evident mistake, is it the fault of the source or of the surviving second-hand author? For example, the lost source may have been too ancient, so that its statement was true when it was written, but not anymore when the new author borrowed it. Or else the text of the lost source may have been corrupted during its transmission, so that when the new author received it, it was no longer intelligible. Or even the source text may have been in an acceptable state, but the new author could have been incapable of understanding it and tried to make sense of it as best he could and, with no means for verifying the data, mistakes would have easily occurred. Or perhaps it was simply considered more authoritative to follow a well-established source without questioning.[82] Such problems in the transmission of lost literature would explain, for example, why Strabo does not refer to the port of Dertosa:[83] was his source faulty in origin? Did it have parts missing when Strabo consulted it? Did Strabo skip parts of it, whether intentionally or by mistake? Or was there an actual reason why Dertosa may not have been a desirable port? As Arnaud (2013) argues, for ancient geographers, who were often unable to visit all the places they were writing about, their criterion for "truthfulness" was the reliability of the source – something that does not necessarily assure error-free new texts. Because of the difficulty (if not impossibility) of reconstructing lost sources, whenever textual problems are found, I shall only study them from the data that can be provided on the perspective of the preserved contents. In other words, if there is a geographical mistake, I shall explain it in detail, but without making a deep philological comment, as this is outside of the aims of this thesis. In addition, these kinds of fragmentary passages usually pre-date the chronological limits of my study by a wide margin, which is another reason why they have not been taken into account.

3.4 The need for archaeological analysis

Case studies are very valuable due to the scarcity of explicit data referring to port structures in literature, as the following examples will show:

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[82] Cf. Marincola, 1997.

[83] Dertosa, present-day Tortosa in Catalonia (Spain), is nowadays situated on the Ebro Delta. However, in the time of Strabo the Delta was still not formed. Instead, the river ended in an estuary, and the city constituted a major port, as archaeological evidence demonstrates (see Izquierdo, 1990 and 2009 a and b). The curious issue is that Strabo denies that there are any good ports between the south of the Peninsula and Tarragona. However, the river in Tarragona, the Francolí, is small and short, especially in comparison with the Ebro, which is navigable and provides access to important urban centres such as Caesaraugusta (Zaragoza). The silence surrounding the port in Dertosa is, therefore, curious.

Pausanias, 1.1.4	
ἔστι δὲ καὶ ἄλλος Ἀθηναίοις ὁ μὲν ἐπὶ Μουνυχίᾳ λιμὴν καὶ Μουνυχίας ναὸς Ἀρτέμιδος	There is another *limen* for the Athenians, that in Mounychia, and the temple to Artemis Mounychia.

Thucydides, 6.49 (fragments)	
Λάμαχος δὲ ἄντικρυς ἔφη χρῆναι πλεῖν ἐπὶ Συρακούσας καὶ πρὸς τῇ πόλει ὡς τάχιστα τὴν μάχην ποιεῖσθαι […]. ναύσταθμον δὲ ἐπαναχωρήσαντας καὶ ἐφορμηθέντας Μέγαρα ἔφη χρῆναι ποιεῖσθαι, ἃ ἦν ἐρῆμα, ἀπέχοντα Συρακουσῶν οὔτε πλοῦν πολὺν οὔτε ὁδόν.	Lamachus said that it was necessary to sail at once against Syracuse and make war against the city as soon as possible […]. As a *naustathmon* to retreat and to drop anchor in, he said, it was necessary to use Megara,[84] which was deserted, and it was not a long distance from Syracuse nor by sea neither by land.

Caesar, *Gallic War*, 4.36	
Ipse idoneam tempestatem nactus paulo post mediam noctem naves solvit, quae omnes incolumes ad continentem pervenerunt; sed ex iis onerariae duae eosdem portus quos reliquae capere non potuerunt et paulo infra delatae sunt.	Caesar himself, at the appropriate weather, set sail a little after midnight, and all his ships arrived intact at the continent, but among them two cargo vessels could not reach the same *portus* as the others, and they were carried away a little further down the coast.

True, Pausanias informs us that Mounychia is a λιμήν/limen; Thucydides, of the use of Megara as a ναύσταθμον/naustathmon; and finally Caesar, that all his ships except two reached a *portus*. But what was to be expected from a λιμήν/limen such as Mounychia? What infrastructure was required for a ναύσταθμον/naustathmon? What kind of place was a *portus*, so that it is not called something else, e.g. *statio*? This underlines the need for

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[84] The text refers to Megara Hyblaia, a town in Sicily a short distance north of Siracuse.

the ontological approach that I advocated at the beginning of this section: the study that the same place can be seen as one thing or the other depending the perceptions of the writer.

Therefore, in order to understand the distinctive features of each port, it is best practice to actually *look* at the ports – i.e. at the archaeological or physical remains that are still available nowadays. For this purpose two case studies have been added to the study of the words in isolation. A note of caution, though, on relying too much on the archaeology, namely the problems of interpretation. For example, if remains of a wall are found in the sea, is it a mole? A jetty? A quay? A breakwater? This will largely depend on how the archaeologist interprets the function of the remains, and possibly also what language they are writing in (see Wawrzinek, 2004). For example, Pirson, in the report of the 2010 excavations campaign at Elaia (Pirson, 2011 : 176), after describing some structures in the sea, suggests they might have been saltbeds, but he clearly warns that the exact function is unknown with the data available up to date. Therefore, archaeological data is certainly a useful tool, but it, too, has a number of interpretative issues, as highlighted by Allison (1999) mentioned above.

3.5 Choosing the case studies

One of the challenges with my approach is that archaeological evidence, like textual evidence, is also incomplete, due to the nature of publications and the unequal survival of remains at different periods in time. And, of course, the identification of stuctures in the archaeological reports depends entirely on individual archaeologists, as explained above. Then, there is the issue of coastal change since antiquity that often masks ports, making it hard to identify the basins with precision,[85] etc. All of this means that a straightforward comparison between the literary and archaeological evidence is fraught with difficulties and highly problematic.

In selecting case studies, I aimed to rely upon the research undertaken by the Portus Limen Project and other published work. Consideration of this was decisive for the selecting of the adequate case study sites and the ruling out of those that furnished only insufficient data. Piraeus, for example, would be a very desirable port to work with, but the main bulk of the data relating to it, both archaeological and literary, belongs to the Classical period (5th-

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[85] E.g. Alexandria suffered from subsidence (Empereur, 1998 : 19-34), whereas Rome's Portus and Ostia are now inland due to the sediments brought down by the Tiber (Salomon, 2013).

4th centuries BC), and is therefore beyond the limits of this thesis. A further difficulty is that the modern city is built on top of the ancient remains, and excavations in Piraeus are rather meagre. This making a comparison of the literature with actual remains of the port unattainable, Piraeus had to be rejected.

A similar problem occurs with Utica, which was another possibility. Due to sedimentation and coastal changes, the remains of the city are now buried at a distance of 12 km from the sea. In antiquity, however, Utica was located in a promontory to the NW of the mouth of the river Bagradas, in a deep bay that offered good anchorage points.[86] But excavations are just at their infancy, and the material remains so far unpublished.

Carthage was also considered. However, the literary data is scanty, and it is mostly dependent on Appian's quote from Polybius[87]. Archaeological data is abundant only for the Punic period, the information for the Roman period is extremely reduced, and there is little-to-nothing relating specifically to the port.

I would have liked to take a look at one of the minor ports of the Empire, in order to show how a site of lesser importance was articulated. Immediately, the problem of the lack of references, both in the ancient texts and in the modern research, became obvious. This was the case with Pyrgi, Italy.[88] Excavations in ports like Baelo Claudia[89] (in the Project) are also just at their start, so the bibliography is still not sufficient. Reports about other sites, like Empúries,[90] deal more with its inscriptions or its art rather than the port installations. The abundant bibliography about amphorae, for example, is highly interesting on the administrative, juridical and economical aspects, but tells us little about the port's morphology or installations.[91] On the contrary, for the ἐπίνεια/epineia of Pergamon (Kane, Pitane, Elaia, which were also considered for this thesis) there are archaeological

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[86] For Utica, see Lézine (1968), Cintas (1951) and Chelbi-Paskoff-Trousset (1995).

[87] Appian, *Punic Wars*, 452-455.

[88] Enei (2012).

[89] Baelo Claudia might also not have been the best example as it is a port in the Atlantic, which has much stronger tides than the Mediterranean, and therefore structures are likely to be somewhat different.

[90] Pyrgi in Italy and Empúries, in Catalonia, Spain, are both sites outside the Project. However, Strabo's observation that the port of Empúries was at the river mouth seems to be confirmed by the fact that no harbour structures have been found where it would have been expectable to find them. For Empúries, see the bibliographical list in Santmartí (1996). For the excavations, see especially Costa and Ollé (edd.) (2008) and Aquilué (2012).

[91] For the juridical study within the Portus Limen Project, see the thesis by Mataix Ferrándiz (forthcoming).

reports both published and under way, but we do not have any sufficient descriptions in the ancient literature.

Due to all these limitations, the viable option became the choice of two well-documented, major ports: Alexandria and the port clusters of Puglia-Basilicata-Calabria. Several authors provide accounts on Alexandria (most notably Strabo, who lived in this city for a period of time and is a first-hand witness, but also Diodorus Siculus, Caesar and others). A number of authors, but most notably Strabo, provide data for the second case study. The latter region contains ports of varied types, something that facilitates the ontological study, as well as the network relationships between the members of each hub in the region.

3.6 The pragmatics approach
3.6.1 Issues of context: the case of statio

In my approach, given the lack of native speakers, I shall take the extant textual evidence as speech acts, and analyse its context in order to achieve positive definitions of each term. However, this approach is not without its problems, more particularly where the words are polysemic. A good example of that is the term *statio*.

The word *statio* is highly complex to research due to its multiple extensions of meaning. Firstly, *statio* is a derverbal noun formed upon *stare*. Simplifying, as such it designates "a place where someone or something can remain standing". But *who or what* is it that *remains standing*? *Statio* then becomes associated with two images: a soldier standing their ground and a ship staying on place on the water.

In the first case, *statio* designates in general a military outpost or headquarters, not necessarily a maritime installation, but also – and most of the times it is so – a land complex (e.g. Livy, 7.10; Suetonius, *Tiberius*, 37.1; Tacitus, *Histories*, 4.26; Tertullian, *Apologeticum*, 2.8).

In this sense, the expression *in statione / stationibus esse* usually refers to the soldiers standing guard or keeping watch (cf. Caesar, *Gallic War*, 5.15 and Petronius, *Satyricon*, 102.5). The same expression can refer to the taking of positions prior to or after a battle (Caesar, *Civil War*, 1.56). These wordings generate ambiguity in contexts like the passage *Bellum Africum*, 53, where it is not clear if *statio* refers to an actual structure or zone or else to the navy operating their defenses.

Derived from the military outpost, *statio* can also refer to the physical building where an authority performed their task, as documented for example in Suetonius, *Nero*, 37, where the *statio* becomes a kind of consulate or delegation of foreign cities, or the famous stations collecting the *quadragesima Galliarum* recorded, among other inscriptions, in *CIL* 5.5090; 6.8592; 12.2252 and 13.255. Finally, *statio* can also refer metaphorically to the authority themselves, as noted several times in the *Historia Augusta* (*Life of Verus,* 1.6; *Life of Commodus*, 1; *Life of Clodius Albinus*, 2).

The other image, where a ship can "stay put" on water, is discussed in section 4.10.

3.6.2 Linguistic pragmatics and the ontological aspect

While researching the two previous points (single harbour labels and harbour terminology in context), I found that some ports are referred to by two different words, either in the same text or when comparing different authors. This raises the question of why it would be necessary to use two different terms for the same place, especially in those cases when both of the words are in the same text, in contact with one another. Thus, I will devote a part of my thesis to commenting upon those sources that make use of different terminology to refer to the same reality: is A inside B? Outside B? The absence of B? The continuation of B? The function given to a B-type structure? Could it be the case that a port can be both A *and* B depending on the ontological point of view?

This comparison of the words in the same context can only be achieved after the terms in isolation have been positively identified and described. Once the main features of each harbour type are known, it will be possible to compare concurring terms. For example, it may be the case that one of the words refers to the function of the anchorage, e.g. military, whereas the other term refers to its coastal features or infrastructure.

To sum up, my thesis is a first attempt at approaching ports from the perspective of a linguistic aspect of the sources. By using specific acts of pragmatic communication, I shall investigate the semantic implications of each word. Then, I will draw comparison between these words in order to define the limits of their exact semantic space. Lastly, I will revise my understanding of the two case study ports in order to verify my conclusions and help interpolate any information which might be missing from the literary data alone.

4. THE TEXTUAL DATA

4.1 LIMEN

4.1.1 Introduction

Λιμήν/limen is the most widely used term in ancient Greek meaning 'port'. This is one of the first words that any Classics student learns. The most common and basic handbooks introduce this term at the beginning because of its cultural importance and because it is a third-declension word ending in a nasal consonant and whose final lexeme vowel becomes long in nominative and vocative singular. Thus, λιμήν/limen makes for a certainly more complete grammatical study than other words, like ἀηδών 'nightingale'.

However, it is precisely its completeness that makes λιμήν/limen such a complex word to study, as will become evident later. Rougé (1966) classifies this term amidst the words that primarily refer to geography. This is probably correct, but when one examines the texts it becomes extremely difficult to separate the λιμήν/limen from a great deal of infrastructure or economic activities and administrative functions. This word is certainly the most complex one in my thesis, as it seems to be a basic-level term. Basic-level terms are used in such a vast number of contexts that they acquire enormously broad meanings.[92] In this sense, for example, it is recorded that the word *λιμένες*/limenes was a frequent title of sailing-guides[93].

The fact that λιμήν/limen is a basic-level term also causes it to appear in a vast multiplicity of texts. The immensity of the materials to be studied compelled me to make a stricter selection of the sources for this chapter. Thus, only those texts that furnish relevant data have been investigated, while other texts that are out of the scope of this book (too early or too late in the established chronology, or non-Mediterranean), as well as texts that only copy sources that are extant to our day, have been discarded unless they provide vital

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[92] For discussion on basic-level terms, see Rosch (1978) and Hajibayova (2013).
[93] Strabo, for example, uses this kind of guides very frequently, as we can see in the following passages: Strabo 1.1, 2.1.40, 3.1.9, 3.3, 4.4, 4.6, 5.1, 5.2, 5.3, 5.4, 6.2, 6.3, 6.4, 7.3, 7.4, 7.6, 7.7, 8.1, 8.3, 8.5, 8.6, 9.1, 9.2, 9.3, 9.4, 10.2, 10.5, 11.2, 12.3, 12.8, 13.1, 13.2, 13.3, 14.1, 14.2, 14.3, 14.5, 14.6, 15.1, 16.2, 16.4, 17.1, 17.3.

information, as they did not contribute to the solving of my research questions. The texts selected for this section, therefore, are restricted to:

- texts with geographical value: Strabo, Pausanias, and the *Stadiasmus*
- texts with historical value: Polybius, Cassius Dio, Appian, and Philostratus
- fiction providing valuable context: Chariton

4.1.2 An etymological note:

Pokorny (1994³, vol. 1 p. 309, s.v. **el-, *elĕi-, *lĕi-*, 8.D.1) sets the λιμήν/limen in relation to the Indo-European root meaning 'to bend', and in particular, 'elbow'. Generically, this **lĕi-* would signify 'a bend on the land, a bay', and with the addition of a suffix *–m*, it would generate the Greek terms λειμών/leimon, λιμήν/limen and λίμνη/limne, as well as the Latin *limus* 'mud', perhaps in the sense that mud is earth that is easily "bendable" or "sinkable". Indeed, the bending movement can be understood both inwards or downwards, and in this sense it is understandable that the same Indo-European root generated, by virtue of ablaut, two Greek words meaning similar things: the λιμήν/limen or 'bay' and the λίμνη or 'lagoon, lake'. Personally, I have trouble to try to establish a semantical relationship between these two terms and λειμών/leimon 'prairie', unless this is caused by metaphorical extension (for example, the view of the sea with the view of grassland?). This difficult lexemic relationship between λειμών/leimon, λιμήν/limen and λίμνη/limne is also suggested by Beeks and van Beek (2009), and it seems to be generally accepted.

In regards to the relationship between λιμήν/limen and λίμνη/limne, note that the latter usually means 'pool' or 'stagnant water', but in some contexts it also seems to signify 'estuary', such as in Strabo 3.5.9 in the case of the Ebro,[94] which advocates for a very strong semantic relation between these words. Note, indeed, that the original root of λιμήν/limen was *λιμεν, with a short vowel. This ε is lengthened to η only in nominative and vocative. Thus, *λιμεν in grade 0 becomes λιμν-. The fact that λίμνη/limne could also refer to an estuary greatly strengthens its relation with λιμήν/limen, in that ports could also be situated at the mouths of rivers (cf. Arnaud, 2016).

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[94] Some translators, like Falconer and Squire (1903), translate λίμνη for 'lake', which does not make sense in that context because the Ebro does not flow through any lakes. However, the delta of the Ebro was not formed during Antiquity, and the river ended in an estuary, which is what is here referred to by the term λίμνη.

4.1.3 Ancient definitions of the term λιμήν

It is not easy to find ancient definitions of a λιμήν/limen. When we turn to the *Suda* (lambda, 545), under the lemma λιμήν/limen we do not find much relevant information. The entry mentions only the quote in Sophocles (*Ajax*, 682-683), a text which is also irrelevant for this study.[95] There are also a few derivates of λιμήν/limen in the *Suda*, mainly, proper names or compound words such as Λιμένειον/Limeneion or λιμενίοχος/limeniokhos (*Suda*, lanbda 542 and 543). The word λιμήν/limen or its declined variants are also found inside other entries of this lexicon, but these are too wide-ranging to comment on in detail.

Λιμήν/limen also features in other etymological compilations, although they seem to repeat the same information, mainly folk etymologies.[96] An illustrative example of this issue can be found in two entries in the *Etymologicum Gudianum*, λ, p. 370 ss. vv. λιμήν/limen.

In addition to it being a basic-level term, the second issue is that the term λιμήν/limen seems to act on two levels: on a generic sense to refer to the whole site where ships can moor ("the harbour") or more specifically to refer to the exact mooring point (like berths or sub-basins). The distinction between the "harbour" and the "sub-compartments" is usually marked by the word appearing declined in the plural in the latter case. Rougé (1966) seems not to have made this observation, and instead embarks upon a confusing discussion about whether a town can have more than one λιμήν/limen.[97] The distinction that Rougé establishes between maritime or non-maritime towns does not seem to be the relevant one: the question should be how many λιμένες/limenes *a single place* can have, regardless of where the town so-named actually lies because, if the town has one or more λιμένες/limenes, then those will be on site (either on the sea, or on a river or lake). Otherwise, what the town has should be considered ἐπίνεια/epineia. Athens, for instance,

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[95] Sophocles mentions the word λιμήν as a metaphore to denote the haven of comradeship.

[96] Crystal (2008⁶), s.v. *etymology; folk etymology*: «A folk etymology occurs when a word or phrase is assumed to come from a particular etymon, because of some association of form or meaning, and is altered to suit that assumption». A clear example of the folk etymology phenomenon is the modification of the spelling of *licorice* to *liquorice* because of the assumption that it is related to Latin *liquor* 'fluid, fluidity', when in fact it comes from Greek γλυκύρριζα (*glykyrriza*) meaning 'sweet root'.

[97] Rougé (1966) p. 115.

has two ἐπίνεια/epineia: Piraeus and Phaleron. But the Piraeus as a peninsula has three λιμένες/limenes (Piraeus proper, or Kantharos, Mounychia and Zea).[98]

Similarly, Rougé (1966 : 115 ss.) states that λιμήν/limen is not opposed to other terms. Personally, I think this should be explained in a better way: λιμήν/limen does not oppose other terms because it is their superordinate. Therefore, instead of λιμήν/limen being an alternative to the other terms, it is the other terms that imply some kind of specificity (geographical, functional,…) in respect to the λιμήν/limen.

4.1.4 Main characteristics of the term λιμήν ('harbour')
The textual sources document different aspects of the λιμήν/limen harbour. In terms of geographical features, λιμένες/limenes are preferably placed on bays or gulfs, as attested by Strabo, 3.4.6, or Philostratus, *Lives of the Sophists*, 1.515. Similarly, Strabo, 3.3.5 reports a gulf located between present-day A Coruña and Ferrol in Spain, which is known as the Port of the Artabi, the latter name referring to the local tribe. It is significant that the gulf is known by the name of λιμήν/limen, as this denotes that a gulf or a large bay must have been the prototypical or preferred location for the establishment of ports.

At the same time, a large number of texts indicate that the λιμήν/limen benefits from, or is situated on offshore islands. Alternatively, offshore rocks can perform the same function, which consists of sheltering the access to the harbour by acting as a natural breakwater. However, especially in the case of rocks, their presence can also complicate the operations of sailing in and out of the harbour basin. Examples of offshore islands and rocks include: Strabo, 13.2.2, 14.1.31, 17.3.12, 17.1.14; *Stadiasmus*, 16, 20; Pausanias, 2.29.6, 4.35.1, 4.36.6; Polybius, 1.49.12. A remarkable case is *Stadiasmus*, 182, where a port in a place called Nesoulion ("the little island") is recorded. The *Stadiasmus* describes it as a basin sheltered by an islet, and the latter would have given its name to the port. The problem with this toponym is that it has a too modern aspect, and it is doubtful if it featured in the original *Stadiasmus*.[99] Nesoulion in the *Stadiasmus* might be an "update" on an ancient

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[98]In this respect, see Pausanias, 1.1.2-3.

[99] The modern aspect of the toponym Nesoulion is caused by the suffix −ουλιον (-ουλι in modern Greek). Andriotis (1992 : 253-254) explains that Koukoulis derived it from the medieval suffix −ουλλιν, which is in turn the evolution of the ancient Greek suffix −υλλιον (e.g. ἀνθύλλιον, 'little flower'). Instead, Khatzidakis believes that it comes from the Latin suffix −*ullus*, with the same value. In any case, and despite the exact date of the suffix −ουλιον not being established, it is a fact that it first appears in medieval texts.

toponym or an insertion by the copyist of our extant codex unicus.[100] Still, the fact that the port can be named after the islet that forms it, is geographically significant. Alternatively, some ports are placed on a side of a peninsula or a cape. Examples include Strabo, 14.1.30, 14.3.4; *Stadiasmus*, 20, 139-140; Pausanias, 5.7.5 and 7.5.6. Figure 8 below shows the examples of Teos (Strabo 14.1.30) and Branchidai (Pausanias 5.7.5), incidentally the latter also with the protection from offshore islands:
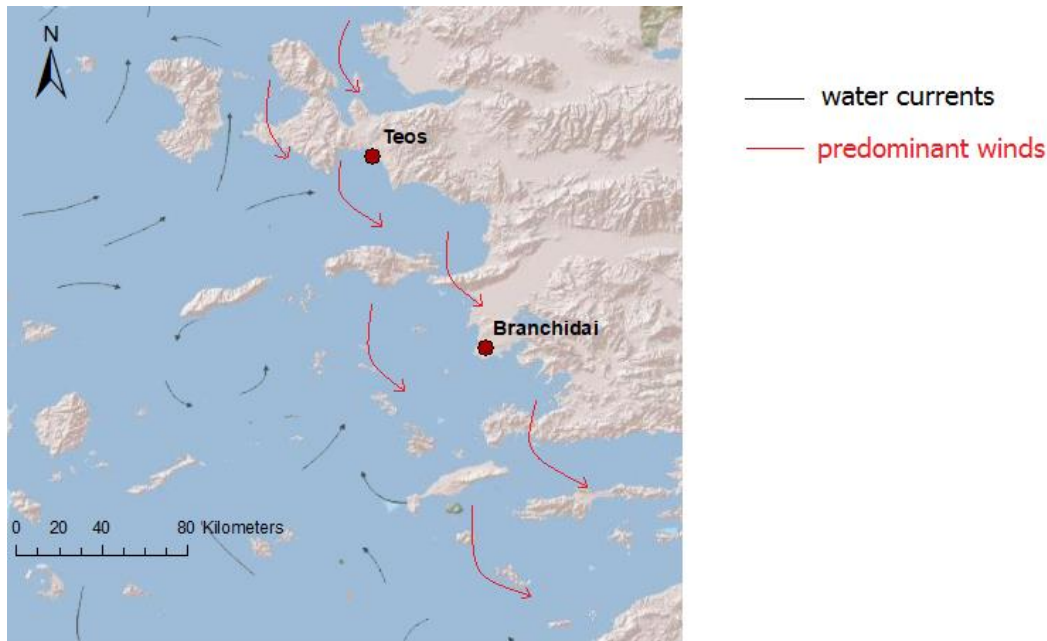
Figure 8. Λιμένες sheltered from predominant currents and winds

Particularly in the Eastern Mediterranean, it has been suggested that headlands were useful for navigation as the points where sailors could come closer to the land while sailing, and use them as stopover landmarks as part of a longer journey, as well as for orientation. Headlands could offer protection from certain winds, although violent kathabathic winds would represent a danger when approaching them.[101]

Artificially arranged ports could also be furnished with artificial islands. The raising of artificial islands is recorded mostly in Latin texts, but see Philostratus, *Lives of the sophists*, 2.606 for the Greek part. Artificial islands served as breakwaters, as well as being able to

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[100] This toponym is not known elsewhere. However, according to P. Arnaud (personal communication), the place should be identified with the present-day Bogsak Adası, where the medieval portulans place a certain Portus Pini.

[101] Morton (2001 : 68-85 and 177-185)

furnish landing space. However, the usual means to enhance the shelter of a port would be with a breakwater, rather than an artificial island. The water spaces of Assus, Mitylene, Caesarea Maritima, and Portus itself are all formed with moles (respectively: Strabo, 13.1.57, 13.2.2; Flavius Josephus, *Antiquities of the Jews*, 16.13;[102] Cassius Dio, 60.11.1-5).

It is also attested that some λιμένες/limenes are situated at river mouths. The best-known case is probably the port of Padua on the river Meduacus (possibly present-day Bacchiglione, which discharges near Chioggia). The river served as a navigable canal, which made it possible to ship the merchandise upstream and send it inland to Padua and other towns. *Stadiasmus*, 345 also records a λιμήν/limen on Crete which is situated at the mouth of a river. The port, Amphimatrion, is good enough so that the ships can winter and it is also equipped with a tower.[103] Alternatively, some port basins are formed in such a way that one needed to sail through a short channel to access them. In this case what is sought is the protection of the harbour, both from the currents and swell, as well as from enemies who might attack the city from the sea. Access channels are recorded in the literature, for example in Strabo, 13.1.57. Some channels are preserved or traceable still nowadays, like those that have been detected at Portus, near Rome (Keay et al. 2012, and Figure 9).

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[102] 16.2.1 in other editions.
[103] It is unclear from the context of the *Stadiasmus* what is exactly meant by πύργος. The literal translation of this word is 'tower', but is it a defensive, watch-tower? Or is it perhaps a tower supporting a beacon, i.e. a lighthouse?
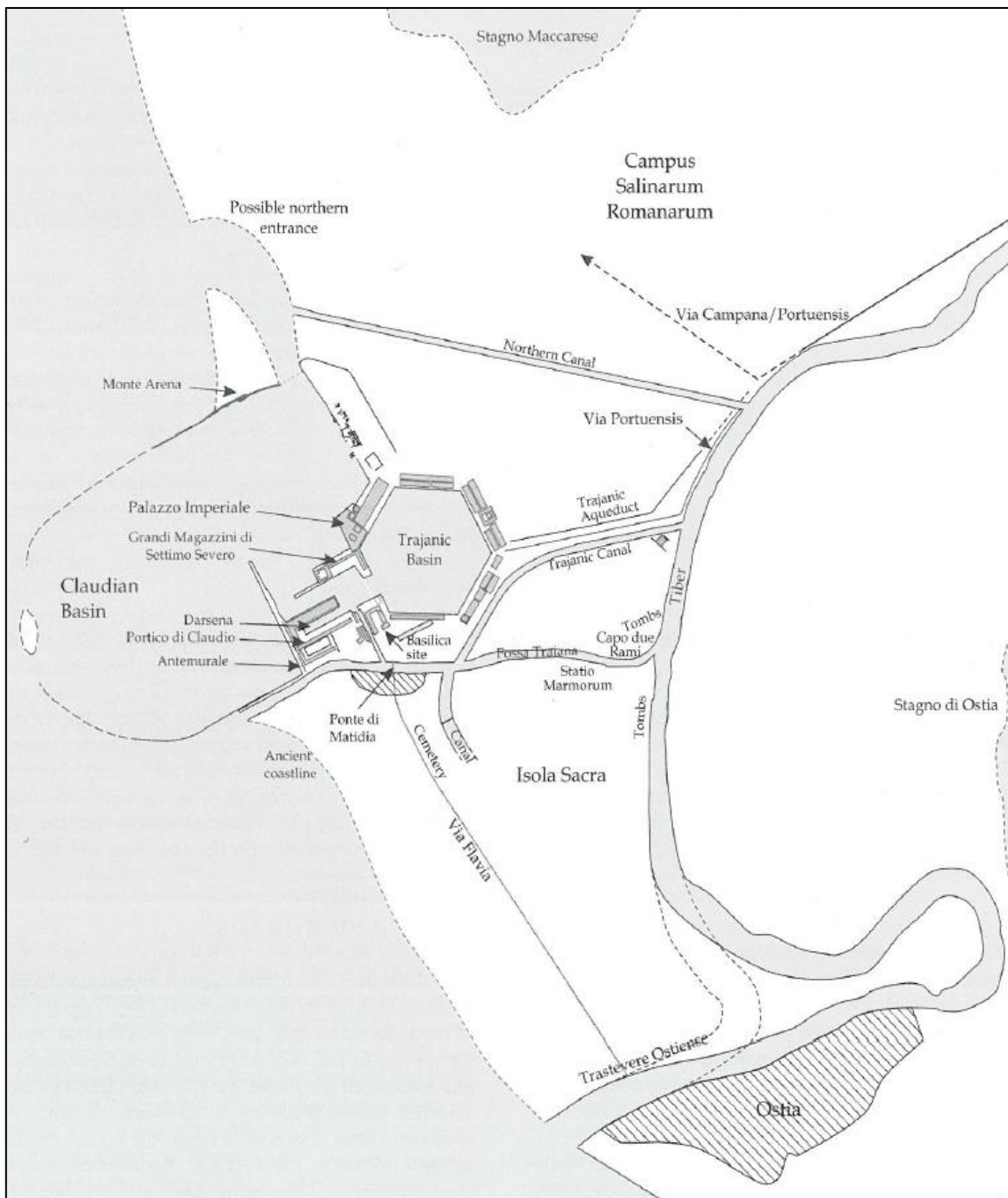
Figure 9. Reconstruction of the Roman harbour at Portus in the 2ⁿᵈ century AD. Source: Keay (2012, fig. 2.5)

Features of the landscape other than those described already are documented only rarely as harbour locations, thus indicating that it was probably exceptional if the harbour was not situated on a bay, island or peninsula. For example, the *Stadiasmus*, 35, notes that the λιμήν/limen is on level, sandy ground. One wonders, though, if this should be understood as a warning for ships to be careful not to run aground, or to tranship to smaller boats. Similarly, Philostratus, *Heroicus*, 33.17-18 identifies the location of the port as an ἀκτή.

This term, however, is quite unhelpful as the meaning is not particularly clear, it probably refers merely to 'the coast' in a generic way.[104]

Another issue that appears repeatedly is that of the geographical features on the background of the λιμήν/limen. Authors record particularly mountains or promontories in the background, without giving explicit reasons in most cases. The reason for this is probably that mountains and promontories constitute landmarks visible from afar thanks to their height, or possibly also to warn sailors of violent kathabatic winds. The effect of winds, though, is recorded only rarely, with only the *Stadiasmus* informing us of their suitability or adversity with relative frequency (e.g. 16, 20, 304). Marginally, Strabo (5.2.5, 14.1.32, 14.3.9, 14.5.6) suggests that mountains on the coast were relevant as hiding places for pirates when they were not at sea, thus warning sailors of another danger.

The literary sources also show that the depth of anchorages was an issue for sailors. Two texts are particularly illustrative of this aspect. Strabo, 5.4.5 records the conjoining of the sea at Pozzuoli with Lake Avernus and Lake Lucrinus. He states that Lake Avernus is too deep for the ships to anchor safely, and it is preferable to sail further up into Lake Lucrinus, which is more convenient. Strabo does not elaborate, but we know empirically that anchors need a certain angle so that they can exercise the correct traction and keep the ship in place. In essence, if the basin is too deep, the anchor's cable will not rest at an angle, but instead will become positioned in too open an angle or even in a vertical line. In this way, the currents will make the ship drift or shift position.[105] Since Lake Avernus was an ancient volcano crater, its depth was considerable (estimated ca. 33-35 m)[106] and it was, indeed, unsuitable for the anchor to be fixed at a sufficient angle. A similar problem is recorded by Polybius, 1.47, describing the Roman siege of Lilybaeum. That text shows how the mouth of the harbour is too deep for them to blockade it by filling it with stones or rubble. Therefore, the Romans are forced to besiege the port with a line of ships, but that siege line is still not enough to stop their Carthaginian enemy from sailing in and out of the harbour. The Romans are helpless in preventing their Carthaginian enemy from breaking through

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[104] Originally, ἀκτή might have referred specifically to a rocky coast, as opposed to the αἰγιαλός/aigialos, which was sandy. But eventually ἀκτή came to designate simply the coast. For discussion, see Finzenhagen, 1940, pp.134-137. Kowalski (personal communication) suggested that the ἀκτή may have been any part of the land visible from the sea. I believe this is a reasonable assumption, but I have not found this explicitly in my sources, therefore more research would need to be carried out, possibly by means of GIS.

[105] Different types of anchors were in use throughout antiquity. For details on those, see Campbell (2017), section 3.

[106] Cf. Paganin et al. (2013) and Caliro et al. (2008).

their line because the mouth of the harbour is too deep, until they find a place that is shallow enough for them to drop anchor and build a mole.

Incidentally, it is very frequent to find mentions of moles in the literary descriptions of harbours owing to the essential function that they performed. Generally speaking, the Greek term for a mole in the sea is χῶμα, although ἔρυμα is also employed. The first noun strictly refers to earth or rubble piled up (i.e. the material configuration of the mole), whereas ἔρυμα refers to its function in safeguarding the harbour. Because of this, an ἔρυμα can also be a natural formation, like the rock of Mothon documented by Pausanias, 4.35.1. The safeguarding function is also noted by Diodorus Siculus, 20.85.4, describing the Rhodian defences against the siege of Demetrius Poliorcetes in 305 BC[107]. Ornamental features could also be added to the mole, like the bronze statue of Poseidon at Kenchreae (Pausanias, 2.2.3). The mole at Carthage is a special case. Appian[108] suggests that the mole was used as a fore-port by merchants. Hurst (2010 : 53) identifies this mole with the so-called Quadrilateral of Falbe, which were some concrete walls forming the entrance of the main harbour. However, since Carthage had its first basin specifically planned for merchants, one wonders why merchants would stay in the quadrilateral instead: were they queuing? Were they trying to avoid tax? Was it ships of larger tonnage staying at the entrance, because the inner harbour was becoming too shallow due to siltation? Had this always been the case or at what point were merchants forced to stay at the χῶμα? Much more research is needed on the port at Carthage, particularly during its Roman period, to answer these questions, especially owing to the lack of textual evidence.

Anecdotally, Pausanias, 2.29.11 records a trial happening at a χῶμα because the king of Aegina did not want the accused of murder to set foot on his land. While this is an extreme case, it shows that the mole also had a secondary function of marking the boundary of a territory.

4.1.4.1 Λιμένες in the plural as spaces within a single harbour complex

A number of texts use the term λιμένες/limenes to refer to one place. While it is true that some towns had more than one harbour (e.g. Athens, Alexandria, Syracuse, Miletus,…),

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[107] For the harbours at Rhodes: Blackman (1996), Blackman (1999-2000), and Philemonos-Tsopotou (2004).

[108] Details on the port of Carthage are mostly found in Appian's account of the *Punic Wars*. For the mole in particular: 582-587, or 18.123-124 (depending on the editions).

this is not always the case. Therefore, we must ask ourselves: what does it mean that one location has several λιμένες/limenes?[109]

In some cases, a λιμήν/limen can be understood as a "compartment" within the ensemble of a port. A good example of that is Tarentum, as recorded by Appian, *Hannibalic War*, 142-143.[110] He indicates that the λιμένες/limenes face north, and are approached through a narrow passage which is closed by bridges. Tarentum had an external and an internal basin separated by an islet, with the internal basin split in two large spaces, as shown in Figure 10. In this case, the λιμένες/limenes in the plural probably refer to these two sub-basins, potentially also as spaces that are distinct from the outer basin (nowadays the so-called Mare Piccolo, potentially also the Mare Grande).

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[109] Another issue is when the literature mentions λιμένες/limenes in order to refer to the different basins of one same city – it usually does so in relation to cities that are in the Greek cultural area, e.g. Cyzicus (Strabo, 12.8.11), an Aeolian city at Tenedos (Strabo, 13.1.46), Mytilene (Strabo, 13.2.2), Miletus (Strabo, 14.1.6), Gerrhaeïdae, 30 stadia north of Teos (Strabo, 14.1.30), and Phaselis (Strabo, 14.3.9). In consequence, the data seems to advocate for the existence (or at least the literary perception) of a Greek type of harbour, with multiple basins, although this could also be conditioned or favoured by the geographical location of these ports (compare, for instance, the outline of the Greek peninsula with that of the Iberian peninsula). A non-Greek case in the data examined for this thesis is Lilybaeum in Polybius, 1.42, but the term λιμήν recurs in the singular in 1.44, therefore the time that the plural was used might refer to berthing spaces.
[110] Or 6.34 in other editions.
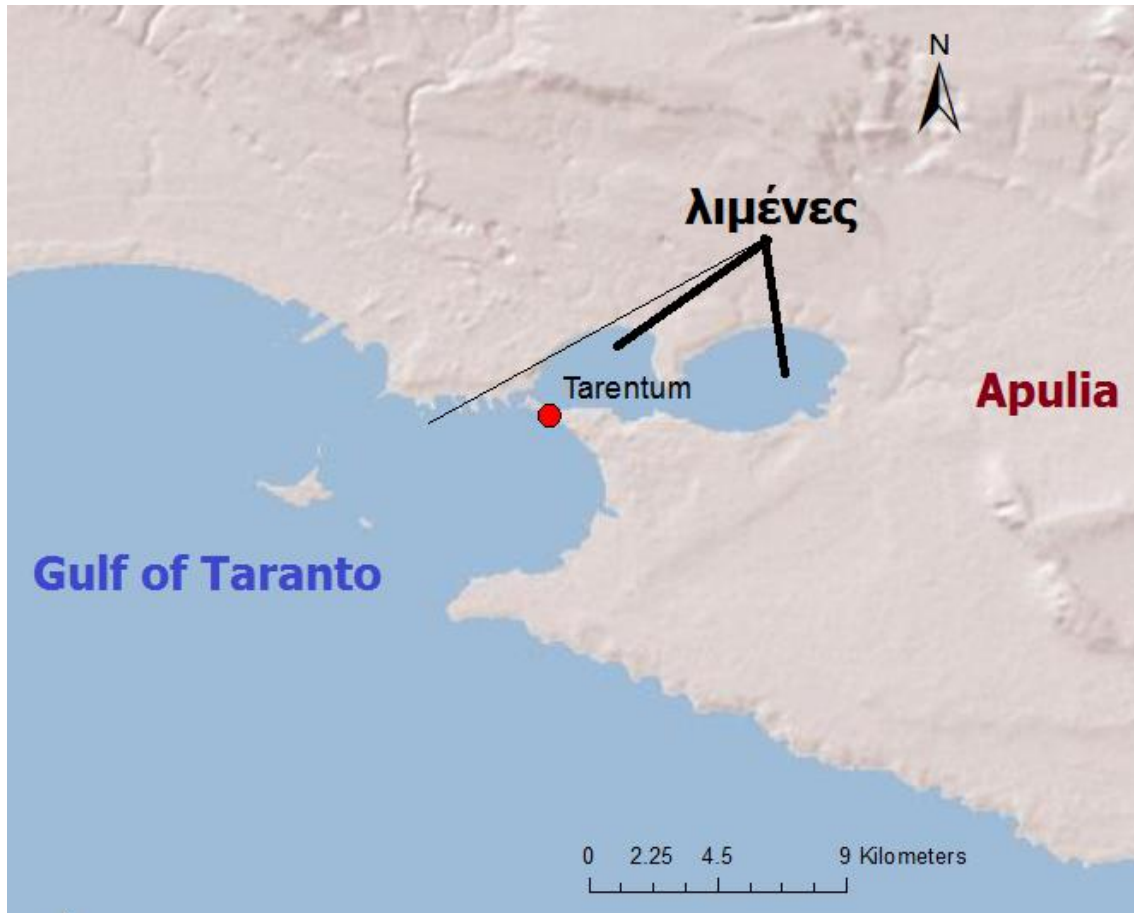
Figure 10. The λιμένες/limenes of Tarentum

In a similar way, Appian, *Mithridatic War*, 103,[111] describes an attack against the λιμέσι/limesi (dative plural) of Rhodes. Rhodes, it seems, had three adjacent basins separated by tongues of land and a mole.[112] Contrarily, Strabo, 5.2.5 states that there are many λιμένες/limenes *inside* the port of Luna. If Luna is to be identified with present-day Luni, which lies in fact by an open coast, it does not have sub-basins like Tarentum. It is therefore unclear if the text refers actually to the nearby gulf of La Spezia, with its many indentions. In fact, there is evidence of occupation at La Spezia since prehistoric times, and a harbour on that site is mentioned by Ennius.[113] This raises the question of the extent of territorial or municipal units, if La Spezia was not considered as a different entity to Luna.

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[111] 4.26 in other editions.

[112] Research on the ports of Rhodes is unfortunately quite scarce up to date. In English, see Torr (1857), esp. pp. 1-6 and 31-72. In German, Blackman et al. (1996). In Greek, Blackman (1999-2000) and Philemonos-Tsopotou (2004).

[113] This is preserved in a quote from Persius's *Satires*, 6.6.

It is doubtful that λιμένες/limenes correspond to berths because there exists a specific word for berths, καταγωγαί (from κατάγω, 'to put in, to moor'). While it is not clear if the καταγωγαί correspond to the space where the moored ship rested or to the mooring-rings, it is still the word that is employed in the texts when the authors want to make an exact reference to the berthing facilities. For example, Appian, *Punic Wars*, 347,[114] explains the advantages that Utica offered if they aligned themselves with the Romans rather than with Carthage. These advantages include harbour basins (λιμένας/limenas) with plenty of berthing spaces (καταγωγὰς) that, in this case, were used by the army. Berths were also recorded for commercial purposes, like those at the Sebastos harbour at Caesarea Maritima (Flavius Josephus, *Antiquities of the Jews*, 331-332). That text is even more explicit because the sub-basins of the λιμήν/limen are labelled by a distinctive term, ὕφορμοι/hyphormos.

4.1.4.2 Port towns and ports without towns

The nature of the λιμένες/limenes as the standard form of port results in their close connection with towns. This is why use of the term stands out when ports are recorded outside towns or unassociated with towns. One could argue that some cases may be ambiguous, like Strabo, 14.2.20. In this passage, Strabo refers to Caryanda as a λιμήν/limen, rather than as a πόλις or another word for a settlement. In that case, one could argue that Strabo's source, perhaps a portolan, might have put the stress on the type of port, rather than on the accompanying town. However, other passages are more explicit, such as Strabo, 9.4.4 and the *Stadiasmus*, 139-140. In both cases, a port is mentioned in connection to towns some stadia away. This could simply be due to practical reasons, as the centres of habitation lay further inland in those cases, but they still controlled harbours on the coast. The interesting question here would be if the harbours for the inland towns are still λιμένες/limenes or whether they are in fact ἐπίνεια/epineia, and if so, why? Perhaps the difference lies in them having or not their own administrative authority?

Other examples of ports without a town include those cases where there used to be a town but it had been destroyed or abandoned (Strabo, 9.4.3; Pausanias, 2.38.2; *Stadiasmus*, 304). It is in this sense that one should probably interpret the phrase λιμὴν ἐρεμός in *Stadiasmus*, 309. As Counillon (1998) argues, a λιμὴν ἐρεμός should not be interpreted as

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[114] 11.75 in other editions.

a "deserted port", but as a port without the immediate support of a town. Such a relationship is described in Pausanias, 4.23.7, where the pirates are said to establish their base, Zankle, ἐν ἐρήμῳ τῇ γῇ and building their harbour there. However, it is usually the contrary process, i.e. the abandoning of a town, which is attested. Yet it cannot have been a sudden or straightforward process to abandon a town, especially one with a λιμήν/limen. Strabo, 13.2.4, for example, documents that Pyrrha proper is destroyed, but that the suburb around the λιμήν/limen was still inhabited and active. Strabo, 14.1.37 also speaks clearly of the repopulation of Smyrna around two areas: the stronghold on the mountain and the λιμήν/limen.

Another possibility, though, is that towns may have been moved to another location to avoid the dangers of being directly accessible by sea. This phenomenon is also documented throughout history. A similar situation occurred in the Catalan towns of Premià and Vilassar, in more recent times. The old towns were the ones named today Premià / Vilassar de Dalt ("Premià / Vilassar above"), while present-day Premià / Vilassar de Mar ("Premià / Vilassar on sea") were originally farms or small neighbourhoods of fishermen.

However, due to piracy, those small settlements were fortified, to the point that they developed into towns of their own **(Error! Reference source not found.)**.[115]
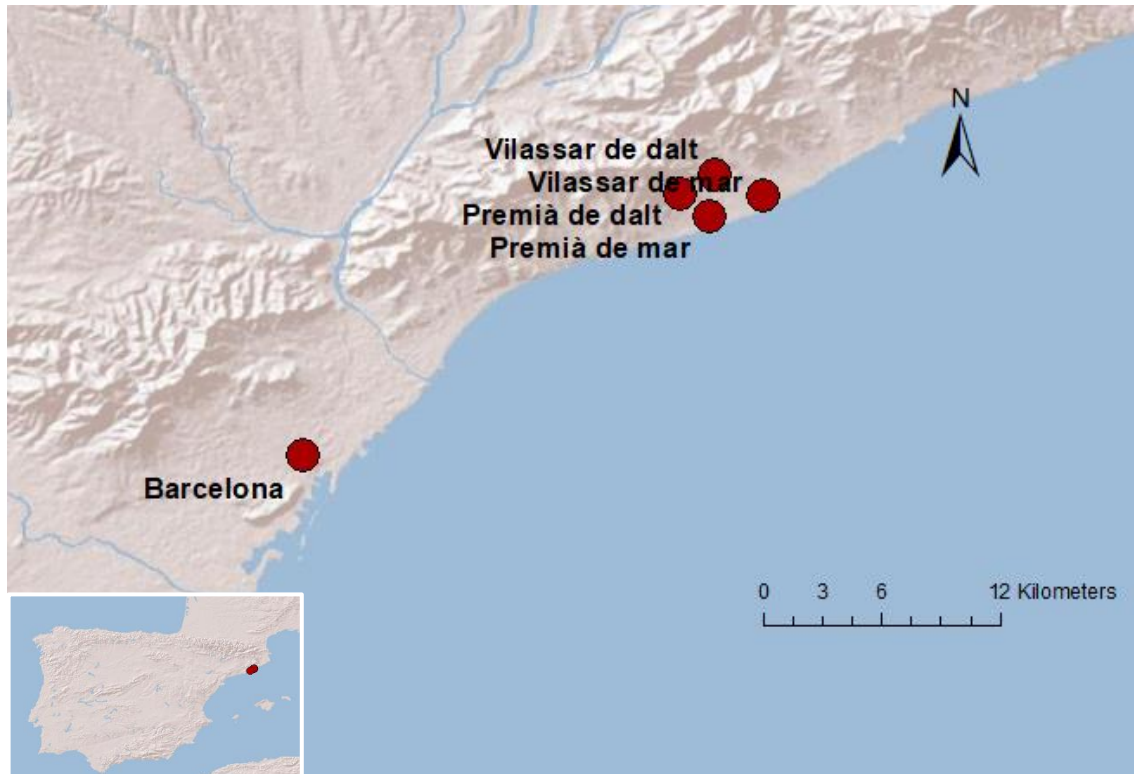
Figure 11. The towns of Premià and Vilassar moved inland for safety

This same process seems to be recorded in *Stadiasmus*, 305a. That paragraph reports a town called Palaia, which I have not been able to locate within the area covered by that part of the *Stadiasmus*.[116] However, Palaia means 'old', therefore it could be the old town as opposed to the new town of a certain community. For example, in a case like Falerii Veteres and Falerii Novi, it would be as if we had lost the Falerii part of the name, and therefore we were only left with Veteres, 'old' (in this case, Palaia). This would also explain why Palaia is a κώμη, a village, rather than a πόλις, because the πόλις would be the new town.

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[115] For a brief summary of the history of the towns, see Enciclopèdia.cat, ss.vv. Premià de Mar and Vilassar de Mar. For further discussion and documental details: Coll Monteagudo (2004), Moragas i Botey (1995), and Casanovas i Vilà (1978).

[116] Incidentally, there is another Palaia noted by Strabo, 14.6.3, but in a different place. It could be that one of the two authors has misplaced this location due to its generic name.

4.1.4.3 Good port, bad port: the quality of the λιμήν

A recurrent concern of the sources is the quality of the λιμήν/limen, and whether the anchorage capability and shelter that it offers are sufficient or not. Linguistically, the specification of the quality of the port can be made my means of adjectives (e.g. "a deep harbour") or by turning the noun λιμήν/limen itself into an adjective by means of prefixes. The results of that are ἀλίμενος/alimenos ("no-port", "harbourless") and εὐλίμενος/eulimenos ("good port"). While ἀλίμενος/alimenos appears remarkably often, εὐλίμενος/eulimenos is less frequent. In the whole Greek literary corpus, there are respectively, 168 vs. 98 occurrences.[117] In fact, after personal inspection of the texts, one has the impression that if the λιμήν/limen was of good quality, authors would specify why, rather than just say it is εὐλίμενος/eulimenos. For example, Pausanias, 9.23.7, defines the λιμήν/limen as ἀγχιβαθής (ankhybathes), i.e. having sufficient inshore depth. Similarly, Strabo notes in several occasions that a λιμήν/limen is κλειστός/kleistos, meaning that the basin is closed or closable (e.g. 12.8.11, 14.2.3, 14.6.3, 17.1.6). Toponymy might also be interesting to study as it can furnish clues in relation to why ports are considered good. A paradigmatic case is documented by the *Suda*, κ, 2310, of the λιμήν/limen in Troezen, which is nicknamed Kophoteros, or 'very deaf', because it has such a long and narrow access that it mitigates the impacts of the sea – and its sounds with them (**Error! Reference ource not found.**):

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[117] *TLG* search on 23rd May 2017, not taking into account derivates and comparative and superlative forms of the adjectives.
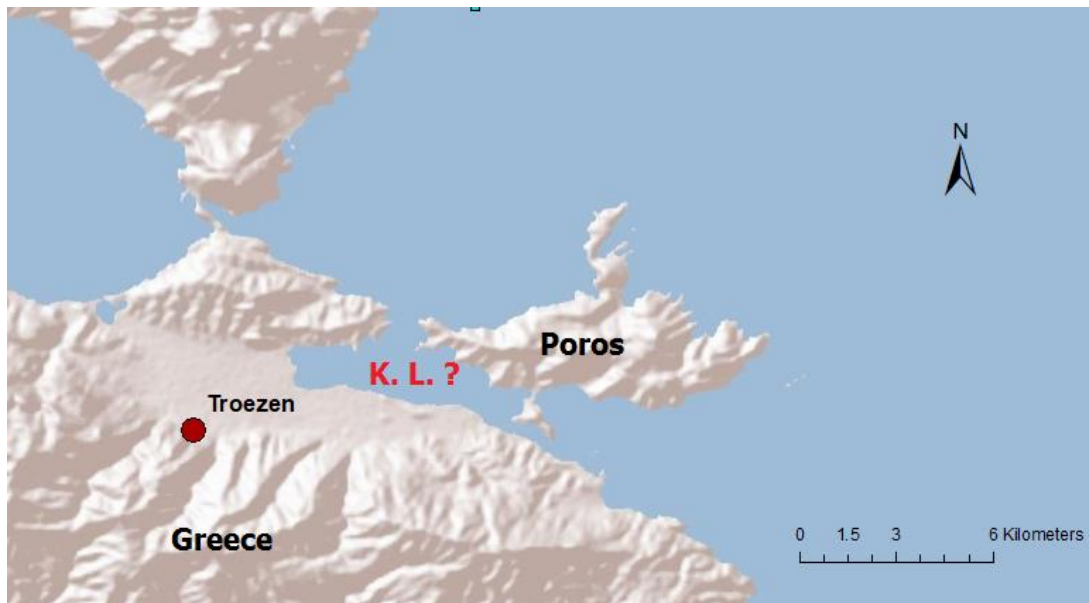
Figure 12. Possible location of the Kophoteros Limen (K.L. in the figure)

The adjectives κλειστός/kleistos and ἀγχιβαθής/ankhibathes stand out. Evidence, however, is quite scanty, with roughly 9 instances of ἀγχιβαθής/ankhibathes and 15 of κλειστός/kleistos in authors within the period (although there are a few more cases before and after the period covered here). The case of κλειστός/kleistos is particularly interesting: κλειστός means 'closed'. However, in the instances attested it seems to include the possibility that the port can be closed by artificial means (such as with a chain or a boom). An obvious case is reported by Cassius Dio, 74.10.5. There exist also instances that are less clear, like Strabo, 13.2.2, which states that the south harbour in Mytilene is "closed (κλειστός) and military". The southern harbour of Mytilene is indeed very closed (**Error! eference source not found.**), but this does not exclude a possibility that it could have been additionally barred by artificial means, such as a chain or a boom, particularly if it did house the navy.[118]

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[118] The Epaphorate of Underwater Antiquities confirmed to me that there have been no underwater excavations at the harbour of Mytilene, but there is an ongoing project to map the port, called Mapping the Harbours of Ancient Lesvos (email communication, 12th July 2017).

Figure 13. Mytilene and its southern λιμὴν κλειστός/limen kleistos

Note as well that the expression λιμὴν κλειστός/limen kleistos occurs in Strabo only in books 12-17, referring to the Eastern Mediterranean and beyond. However, this speaks more for the nature of Strabo's sources rather than for geomorphology. Western ports like those of Massalia, Messana in Sicily, or Tarentum could also be considered κλειστοί/kleistoi, yet Strabo does not employ this term when he describes these locations. Similarly, one could argue that other adjectives like ὀρυκτός/oryktos ('formed by digging, excavated') also collocate with λιμήν/limen, but their testimony is marginal: this phrase only appears twice in Arrian (*Anabasis of Alexander*, 19.4.8-9 and *Indica*, 29.1, as well as six times in Strabo, but all of them refer to the Kibotos basin at Alexandria).

A more complex case is posed by ἀγχιβαθής/ankhibathes,[119] even though this is not at all a frequent term, particularly for the period selected in this thesis. In fact, the only clear example of the combination λιμὴν ἀγχιβαθής/limen ankhibathes that falls within the period of this thesis is Pausanias, 9.23.7. Arguably, Strabo, 5.4.5 (κόλπος ἀγχιβαθής − kolpos ankhibathes) would also be of interest. The texts refer respectively to Larymna[120] and Lake Avernus. Because this example only occurs once − arguably twice − in the corpus, rather than being a type of port it is more likely that this is a port with a certain characteristic. In other words, there is no ἀγχιβαθής/ankhibathes type of λιμήν/limen, only *some* λιμένες/limenes that happen to be ἀγχιβαθεῖς/ankhibatheis. What we must

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[119] I would like to thank J. Whitewright, C. El-Safadi, and P. Tsakanikou for their comments on this point.
[120] For the topography of Larymna, Oldfather, 1916.

ask ourselves is why ἀγχιβαθής/ankhibathes occurs so few times in relation to ports, since it seems to be an advantageous feature of the harbour basin.

This adjective is a compound of the two terms ἀγχι+βαθής. The latter refers to the depth. Ἄγχι/ankhi, in its standalone form, is an adverb that means 'near, close'. A quick look at the dictionaries (*LSJ*, *Bailly*, *DGE*) demonstrates that, while the meaning of the adverb is generic (e.g. *Iliad*, 8.117: Ἕκτορος ἄγχι, 'next to Hector'), this adverb is employed with a relative frequency in contexts relating to the sea, as shown in the following table:

reference	original text	translation
Homer, *Iliad*, 9.42-44	εἰ δέ τοι αὐτῷ θυμὸς ἐπέσσυται ὥς τε νέεσθαι // ἔρχεο· πάρ τοι ὁδός, νῆες δέ τοι ἄγχι θαλάσσης // ἑστᾶσ',	if your spirit compels you to return, go! The road lies in front of you, and your ships stand by the sea.
Homer, *Iliad*, 10.161	οὐκ ἀΐεις ὡς Τρῶες ἐπὶ θρωσμῷ πεδίοιο //εἵαται ἄγχι νεῶν, ὀλίγος δ' ἔτι χῶρος ἐρύκει;	Do you not know that the Trojans on the top of the plain are encamping next to the ships, and only a small stretch of land keeps them away?
Aeschylus, *Persians*, 467	ὑψηλὸν ὄχθον ἄγχι πελαγίας ἁλός	a high hill by the salty sea.
Apollonius Rhodius, *Argonautica*, 1.553-556	αὐτὰρ ὅγ' ἐξ ὑπάτου ὄρεος κίεν ἄγχι θαλάσσης // Χείρων Φιλλυρίδης, πολιῇ δ' ἐπὶ κύματος ἀγῇ // τέγγε πόδας, καὶ πολλὰ βαρείῃ χειρὶ κελεύων // νόστον ἐπευφήμησεν ἀπηρέα νισσομένοισιν·	Chiron, the son of Phillyra, came down from the summit of the mountain to the sea, he bathed his feet in the grey, shaky waves and waved his hands greatly as he shouted: " I wish a safe return to you sailors!"

Dictionaries generally translate the compound ἀγχιβαθής as that place which is "deep inshore", or the coast which is "deep close to the land". This is based on the etymology, and possibly also on the surviving epitome of the *Lexicon Homericum* of Apollonius the Sophist (1st century AD), who provides the same definition s.v. ἀγχιβαθής. The *Suda*, s.v. ἀγχιβαθής, provides only the contemporary version ἐγγύβαθος, based on the same structure, simply replacing ἄγχι for ἐγγύς, which had a more widespread use. Contrary to that, the mid-12th century AD *Etymologicum Magnum*, s.v. ἀγχιβαθής, explains that this is a coast without surf. This suggestion that ἀγχιβαθής refers to calm seas is not transparent from the ancient construction, and it is thus unclear whether we are dealing here with a case of semantic evolution (i.e. a change in meaning caused by the speakers' perception that the main characteristic of an ἀγχιβαθής port would no longer have been that of "depth" but "lack of surf", because the latter is a consequence of the former), or instead the medieval scribe was unable to understand the word in its original meaning.

However, one fails to grasp the original use of the word. It is true that some coastal areas are deep right until the shoreline, while in other areas the sea floor slopes, so that it becomes shallow relatively far from the land. This characteristic seems sufficiently important for the term ἀγχιβαθής to have had a significantly higher presence in the corpus. Unfortunately, I have not been able to find bathymetry studies that are detailed enough in order to draw more exact conclusions on this point. For example, an *a priori* sloping sea floor could be located in the area of Egypt and the Levant, but bathymetry models do not show those areas to have visible differences from Greece.[121]

For comparison, the *Periplus of the Red Sea* is the only text of this kind that employs the adjective βαθύς regularly. Yet this text is still unhelpful for the meaning of ἀγχιβαθής, because the *Periplus* generally makes use of the adjective βαθύς to signify that a bay extends largely inwards into the continent (e.g. 32), rather than in the sense of "long distance to the sea floor". Although there are a few cases, like paragraph 29, which present some ambiguity, the only clear instance of βαθύς in the sense of water depth is paragraph 44. This paragraph explains that boats are stationed at basins consisting of deeper zones within the river Barygaza. Yet this comparison is still not unequivocal, and ἀγχιβαθής is better understood in the traditional way ("deep inshore") from its etymology, since evidence speaks clearly against this term being in widespread use.

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[121] For bathymetry, cf. http://www.emodnet.eu/geoviewer/#!/. Last accessed 23rd June 2018.

Ports regarded as favourable include those where the basin is large (Strabo, 5.2.5, 17.1.14, 17.3.12), have multiple basins (Strabo, 10.2.16; *Stadiasmus*, 3; Appian, *Punic Wars*, 347),[122] have favourable winds (*Stadiasmus*, 297), a favourable coastal morphology (Polybius, 10.1), or are safe enough for ships to winter in (Polybius, 1.24.8-9).[123] In some cases, the port is described as θερινός, or "for the summer season", such as in *Stadiasmus*, 325. I leave it to the reader to judge if this quality is good or bad.

In the case of bad quality λιμένες/limenes, usually authors content themselves with describing the coast as ἀλίμενος/alimenos. We have to understand this adjective as meaning that the coast is open, and therefore exposed to winds and strong water currents. The case is particularly evident in fragments from Polybius, where the adjective ἀλίμενος/alimenos is set in opposition to somewhere else: Polybius, 1.54.6-8, with the place where the Carthaginian ships do *not* wreck, and in 10.1.1, with the ports at Tarentum. As shown in Figure 14 below, the coast described as ἀλίμενος/alimenos is open, in opposition to the place where the Carthaginian ships may have taken refuge and to the ports of Tarentum. In both cases, the other place consists of bays or indentions of some sort into the land. The same is true for the Mediterranean coast of Egypt bemoaned by Flavius Josephus, *Jewish War*, 4.605-609:[124] it has no bays or shelters apart from Pharos-Alexandria.

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[122] 11.75 in other editions.

[123] Some passages in the *Stadiasmus* are misleading because the Greek verb for 'spending the winter' and the verb 'to storm' are the same, both derived from the noun for 'bad weather' (χειμάζω < χεῖμα). This is a polysemic verb with the basic sense of 'there is bad weather'. In a first meaning acception, then, the sense of the verb derivates to: 'bad weather appears'. In a second sense, it refers to 'staying somewhere for the duration of the bad weather'. While paragraph 125 does note that the port has a space for the ships to winter, 309 and 314 warn about storms.

[124] 4.10.6 in other editions.
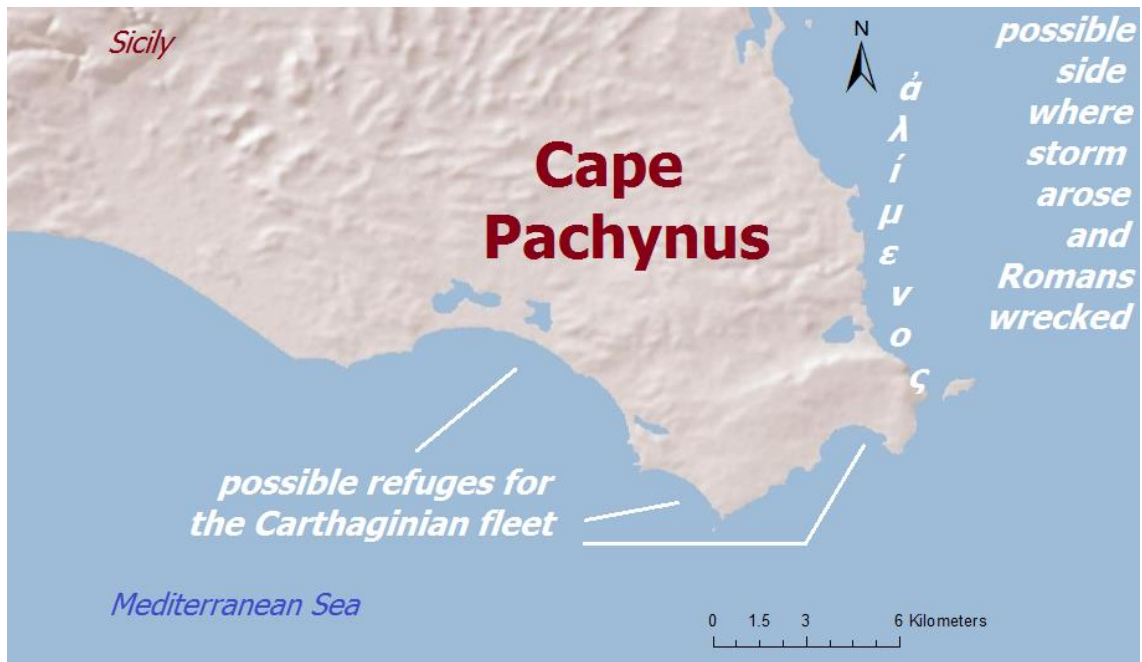
Figure 14. ἀλίμενος/alimenos shores

The texts note it explicitly if the unsuitability of the port was due to a condition other than the coast being open and exposed to the elements. For example, the *Stadiasmus* indicates restrictions of size on several occasions (paragraphs 2, 86, 112, 343).

4.1.4.4 Infrastructure

As noted above, λιμένες/limenes are generally found in towns and inhabited areas. As such, they offer some elements of infrastructure. Yet, a note of caution is due here. The issue with the literary sources is that they have very clear interests. For example: the historians focus on the ports in the context of wars, the geographers show quasi-touristic routes, the *Stadiasmus* records only those facilities that can help or hinder the naval journeys, etc. Because of this, it is difficult to develop a systematic list of the facilities included within the λιμήν/limen, because every text is partial in some way, and authors will only record what is extraordinary, useful or relevant to context, rather than provide a full picture.

Surprisingly, essential port facilities such as landing quays and storehouses for the merchandise are documented only rarely in the literature. This is probably due to the

partial nature of our textual evidence noted above. One text where both landing quays and storehouses are noted is Cassius Dio, 60.11.1-5. Interestingly, the term for the landing structure in that text is κρηπίς/krepis. This suggests a permanent structure of durable material (cf. Herodotus, 1.185, 2.170 and Polybius, 5.37.8). At least one inscription, *IG* 11(2).203 A 95, from 3ʳᵈ century BC Delos, employs the term to refer to the seats of a theatre. This could suggest that the κρηπίς/krepis type quay had the shape of steps in order to accommodate ships of different tonnage, or perhaps also changes in water level.

By contrast, lighthouses are widely documented thanks to their monumentality. They are generally referred to as towers that warn of the dangers out to sea, like submerged rocks – the beacon in the tower is usually implicit. In the literature revised for this chapter, only Cassius Dio above documents a specific word for the beacon (φρυκτωρία). Texts documenting only "towers" include Strabo, 3.1.9, and the *Stadiasmus*, 101, 102, 345, and 349. The latter being a technical guide, it also indicates whether or not ports offer drinking water (e.g. *Stadiasmus*, 16 and 338).

Another essential installation for a port, especially those of a larger size, is the dockyard. Docks appear attested in the literature by means of two terms: νεώρια and νεώσοικος. This would translate literally as "shippery" and "ship-house" respectively. A search for both terms in *TLG* yields 423 results, including ancient and Byzantine Greek.[125] Not all results, however, are equally significant. Some of the literature is extremely fragmentary and not much context can be extracted from it. Because of this, only a significant sample has been selected for a quick overview of these two terms, as represented in Figure 15:

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[125] The search was performed on 16th May 2017, with the criteria: νεωρι 'or' νεωσοικ. This rendered the full declension, as well as some extra results. The 423 results taken into consideration for this search correspond to: νεώρια, νεωρίοις, νεώριον, νεωρίῳ, νεωρίων, νεώσοικοι, νεωσοίκοις, νεωσοίκοισι, νεώσοικον, νεώσοικος, νεωσοίκου, νεωσοίκους, νεωσοίκῳ and νεωσοίκων.

number of mentions of νεώρια and νεώσοικοι in the major Greek authors from the Classical to the Byzantine periods
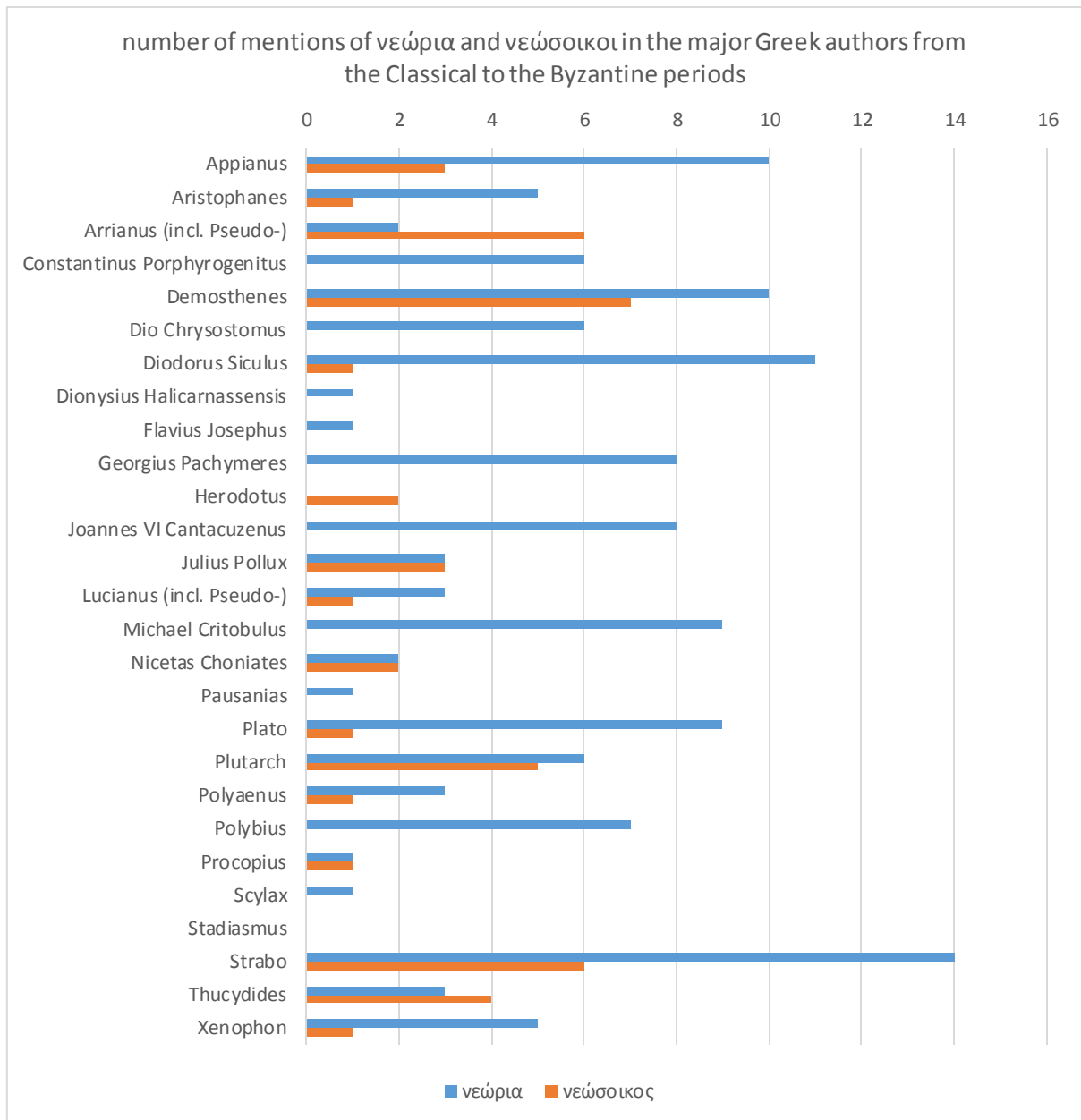
Figure 15. Quantitative usage of νεώρια and νεώσοικος in selected authors

In Figure 15, it is obvious at first sight that the preferred term is νεώρια (with a total 135 occurences), rather than νεώσοικοι (45 appearances). In fact, νεώσοικοι eventually falls out of use and does not seem to survive to the Byzantine period. Perhaps it is due to the confusion between the two terms, as featured in some of the medieval lexica:

	Greek	English	attested in…
1	Οὑρούς: ὀξυτόνως. τὰ νεώρια. καὶ τὰ περιορίσματα τῶν νηῶν.	*Ourous*: oxytone. The *neoria*. And the anchorages of the ships.	Suda, o, 957; Ps.-Zonaras, o, 1479, 17; *Etymologicum Gudianum*, o, 442, 22; συναγωγή λέξεων χρησίμων, o, 227, 1; *Lexica Segueriana*, ν, 282, 3
2	Νεώρια καὶ Νεώσοικοι: μήποτε νεώρια λέγεται ὁ τόπος ἅπας, εἰς ὃν ἀνέλκονται αἱ τριήρεις καὶ πάλιν ἐξ αὐτοῦ καθέλκονται, ὡς ὑποσημαίνουσι Λυκοῦργός τε καὶ Ἀνδοκίδης.	*Neoria* and *neosoikoi*: in no way is the whole place where the triremes are towed out of and back into water called *neoria*, as Lycurgus shows, and Andocides.	Suda, ν, 235; Ps.-Zonaras, ν, 297, 4; Photius, 162
3	Νεώσοικοι: οἰκήματα παρὰ τῇ θαλάσσῃ οἰκοδομούμενα εἰς ὑποδοχὴν νεῶν, ὅτε μὴ θαλαττεύοιεν. ὅτι Πολυκράτης ὁ Σαμίων τύραννος τῶν ὑφ᾽ ἑωυτῷ ὄντων πολιητέων τὰ τέκνα καὶ τὰς γυναῖκας ἐς νεωσοίκους συνειλήσας εἶχεν ἑτοίμους, ἢν ἄρα προδιδῶσιν οὗτοι πρὸς τοὺς κατιόντας, ὑποπρῆσαι αὐτοῖσι τοῖσι νεωσοίκοισι.	*Neosoikoi*: the sheds by the sea built for the maintenance of the ships when they cannot be at sea. Policrates, the tyrant of Samos, after taking the children and the women of the citizens that were with him to the *neosoikoi*, he had them ready, in case they surrendered to the enemies, they would set fire to their own *neosoikoi*.	Suda, ν, 240; Photius, ν, 167
4	Νεώσοικοι: Καταγώγια εἰσὶν ἐπὶ θαλάσσης οἰκοδομημένα πρὸς ὑποδοχὴν τῶν νεῶν· νεώρια δὲ, ἡ τῶν ὅλων περιβολή.	*Neosoikoi*: these are berths by the sea, built for the maintenance of ships. The *neoria*, instead, is the whole perimeter.	Etymologicum Magnum, 601, 18; *Lexica Segueriana*, ν, 282, 3
5	Νεώρια: ὁ ναύσταθμος τῶν νεῶν.	*Neoria*: the fleet of the ships.	Suda, ν, 234

From the lexical compilations above, we can see that the νεώρια and the νεώσοικοι were two distinct concepts (esp. definition 2). Definitions 3 and 4 stress that the νεώσοικοι are places for the maintenance of ships. Contrary to that, definition 1 is very clear in conjoining the νεώρια with the περιορίσματα, or anchoring points for the ships when they are not at sea. This would prove that the νεώρια are simply spaces where to keep the ships when they are not sailing (e.g. when they are wintering), so that the entrance of the harbour is still free for smaller craft, like ferries, fishermen's boats or perhaps even smaller vessels that sail along the coasts, rather than on the open seas. Considering the ships in the νεώρια would be probably military, it is reasonable that definition 5 identifies the νεώρια with the fleet.[126] Definition 4 identifies the νεώρια with "the whole perimeter", which might be a reference to the specific space where the ships are kept when they are not in use, and it coincides with the distinction in definition 1 between the νεώρια and the anchoring points proper, or περιορίσματα. Another passage can be adduced here, namely *Suda*, κ, 483, which corresponds to fragment 168b in the edition of Polybius by Büttner-Wobst. That *Suda* entry states that 50 ships were built, while another 50 were towed "from the existing νεώρια", thus confirming that ships (especially military ships) were kept in those νεώρια while not in use and towed back to the deep sea when they were needed again.

Finally, some ports had unique elements of sailing infrastructure. A good example of that is the *diolkos* in Corinth,[127] which permitted communication between both the basins of Kenchreae and Lechaeum on either side of the isthmus, and in this way it spared the ships a long and arduous journey all around the Greek peninsula. The *diolkos* is documented in Strabo, 8.6.22. Another example are the causeways that Alexander built in several sites, like Alexandria or Tyre. The latter is documented even in fiction, like Chariton's *Callirhoe*, 7.2.8-9. Other facilities are mentioned only occasionally. An example of this is the bell announcing to the people at the port that the market-place in the agora was open, attested by Strabo, 14.2.21.

Fishing facilities, such as huts for the fishermen or a fish market, are generally not recorded, unless it is through the presence of fishermen, such as Chariton, *Callirhoe*, 3.4.11. In addition, mosaics and iconographic evidence tend to depict fishermen in a harbour environment, usually at the edges of the port, particularly on moles (see the mosaic of the

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[126] After that, the text (not reproduced here) continues with a bizarre scene about a beetle. That scene seems to be a reference to a joke in Aristophanes, *Acharnanians*, 919-921.

[127] Cf. Werner (1997).

Santa Cruz Museum in Toledo, Spain; cf. also the mosaic in the church of Santa Maria in Trastevere, Rome).[128]

Since the port was not always right by the city, on many occasions, roads had to be built connecting the λιμήν/limen with the settlement. Roads appear, for example, in Strabo, 10.2.12 and 14.1.37; or Appian, *Hannibalic War*, 142-143. While cities offered all sorts of amenities, some facilities were strategically built on the site of the λιμήν/limen itself. These were especially accommodation services, such as inns, mentioned by Chariton, *Callirhoe*, 1.7.1-3, but they could include leisure buildings like baths (as in Strabo, 10.5.16) and theatres (Pausanias, 2.29.11). The practice of placing leisure buildings by the port is also documented archaeologically, but perhaps they are more linked to the town than to the port proper. For example, Tarraco, in Hispania, had an amphitheatre adjacent to the sea-side, with a circus on the hillside overlooking. Similarly, one can remember the Terme della Lanterna, a bath complex at Portus, standing at the harbour wall separating the Claudian basin from the Canale dell'Imbocco.

Λιμένες/limenes also accommodated public spaces for commemoration and religious activities, including oracles (Stabo, 3.1.9), sacred precincts (Strabo, 10.2.21), tombs (Chariton, *Callirhoe*, 4.1.5) and honorific monuments, like the one to Nicocles, five times winner of the races in the Olympic Games in Pausanias, 3.22.5. Nevertheless, the type of building with the most mentions are temples (ἱερόν or ναός), possibly because they served a second purpose, that of geospatial reference points. Indeed, the *Stadiasmus* records them as indicators for the orientation of the sailors, such as in *Stadiasmus*, 338. Other texts documenting temples are: Strabo, 12.8.11 and 10.5.6; Appian, *Mithridatic War*, 103;[129] Pausanias, 2.29.6; 2.29.10-30 and 3.23.10. For comparison, in the present day, the Admiralty Pilots still note if there are buildings such as chapels visible from the sea, as they provide a visual aid for the orientation of sailors.

Finally, the widespread focus upon warfare in ancient historical texts ensured that a number of defensive installations are recorded. These are remarked upon often than the peaceful, ornamental or commercial facilities. Defensive structures recorded in the authors selected for this chapter include walls creating a passage from the town to the harbour (Strabo, 13.1.22), or just generic-purpose walls (Appian, *Mithridatic War*, 303-304),

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[128] I thank S. Mailleur for making me aware of these references.
[129] 4.26 in other editions.

walls that surround the harbour but include a gate to shut it off from the city in case of an enemy attack (Polybius, 8.30.6; Chariton, *Callirhoe*, 7.2.8-9); palisades (Philostratus, *Heroicus*, 33.23) and booms or chains to bar access to the harbour (Strabo, 14.1.37 and 14.2.3; Appian, *Mithridatic War*, 303-304). Ports could combine several of these defensive strategies, as illustrated by Cassius Dio, 75.10.

It is surprising that, while historians very frequently report about wars, so little attention is directed towards explaining how the features of the port are adapted for war. Generally speaking, texts only say that a certain port was attacked, or that a camp was established near the port (e.g. Appian, *Punic Wars*, 360). [130] Even in a rare case like Appian, *Mithridatic War*, 94,[131] where it is stated that the Rhodians, anticipating the attack of Mithridates, reinforced their walls and harbours, the author still does not provide specific details as to the equipment of the harbour. Examples of the operational aspects of the attacks on or in harbours are also rare. One such example is provided by Appian, *Mithridatic War*, 315:[132] two quinqueremes are brought into the port of Cyzicus. A tower is built on top of them, from which a bridge is deployed by means of a mechanism so that the invaders can reach the city walls from the top. The city, or at least its walls, must have been very close to the harbour if the usage of such a strategy was possible. The word λιμένας/limenas is in the plural, perhaps referring to the two separate berthing spaces, one for each quinquereme.

In addition, both before and after the wars, the documentation shows that ports played an important role in the foreign treaties. For example, Polybius, 18.1-4 exposes the demands of the Rhodians in an assembly, including that Philip of Macedon abandons their ἐμπόρια/emporia and λιμένες/limenes. Flavius Josephus, *Antiquities of the Jews*, 14.147[133] summarises the treaty of the Jews with the Romans, including the petition that the territory and the harbours of the Jews may be at peace. Later in the same work, in 14.249-250, the Decree of Pergamon states that it should be unlawful for the Romans to

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[130] 11.78 in other editions.
[131] 4.24 in other editions.
[132] 11.73 in other editions.
[133] 14.8.5 in other editions.

export from the Jewish ports.[134] Appian, *Punic Wars*, 408-414 reports how Sicily was compelled to surrender her harbours.[135]

4.1.4.5 Economic activity in the port

Although the literature is heavily biased on the military aspect, the primary function of ancient ports was related to the economy. Not only did they serve the purpose of feeding the empire, but ports also formed strategic markets for the import and export of different merchandise. While the commercial aspect is recorded under the term ἐμπόριον/emporion (see section 4.3), texts sometimes report that such or such merchandise arrived or can be obtained from such or such λιμήν/limen. More rarely, texts attest to the presence of harbour workers in charge of something specific related to the conservation of the merchandise, like the officers at Cyzicus mentioned by Strabo, 12.8.11, whose task was to prevent the grain from spoiling by mixing it with Chalcidic earth (probably soil containing lime carbonate).

Comparatively few texts report on economic activities, unless they are in some way extraordinary or relevant. For fiscal issues, for example, we would probably do better to study everyday objects, like tituli picti, papyri, or ostraca.[136] Literary sources only report the unusual phenomena, like the tax exemptions at Delos (Strabo, 10.5.4). Similarly, it is seen as shocking that it took a town 300 years to establish customs at their port (Strabo, 13.3.6), since taxes were an essential source of revenue to the cities that had the advantage of a port. Proof of that is adduced by Flavius Josephus, *Antiquities of the Jews*, 14.249-250,[137] where he explains the terms of the decree of Pergamon, including the prohibition of exporting anything from the Jewish harbours without due payment of tax. Control over the markets dependant on harbours is also emphasised in Chariton, *Callirhoe*, 1.11.6-8, where the pirates decide not to go Athens to sell their booty due to the sycophants, and

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[134] Flavius Josephus, *Antiquities of the Jews*, 14.249-250 (or 14.10.22 in other editions), in fact, states that it shall not be lawful "for them" to export from the harbours. Some editors and translators delete the "not" thinking that "them" refers to the Jews. However, the text from the manuscripts makes sense taking into account that "them" can also refer to the Romans. Since the Jews seem to be re-gaining control of their land, it seems reasonable to exclude the Romans from the usage of the ports without due payment of customs tax, which is in fact what the whole sentence reads.

[135] 12.87-88 in other editions.

[136] Evidence of this kind has been reviewed within the Portus Limen Project in the forthcoming thesis by E. Mataix Ferrándiz.

[137] 14.10.22 in other editions.

instead travel to Miletus, where they avoid tax (1.14.3-5) by selling their slave outside the λιμήν/limen.

In the same way, few economic activities are related to the λιμήν/limen. Examples include the metal mines and fish preserve industry at New Carthage reported by Strabo, 3.4.6. Fishing is also documented at Iasos, but only because the land is not fertile (Strabo, 14.2.21). Industry might also be purposely placed on port locations to facilitate the process of export. A good example of that is the textile industry at Padua reported by Strabo, 5.1.7. Yet commercial imports and exports are only recorded at an anecdotic level, generally as a background to the main action in the text, such as the statues of gods discussed as impious to sell by Philostratus, *life of Apollonius of Tyana*, 5.20; or the fact that the timber for the reconstruction of the temple of Jerusalem was brought from Jaffa, in Flavius Josephus, *Antiquities of the Jews*, 11.78.[138] Piracy is another concern for most authors, such as the reports in Strabo, 14.1.32, Appian, *Mithridatic War*, 261-263,[139] or Pausanias, 4.23.7.

Finally, places suitable for a port are targets for colonisation. A very clear example of this is Massalia, where colonists arrived purposely to found a new city. The relationship with their metropolis is materialised in that the Massilians keep a cult of Artemis Ephesia, as recorded by Strabo, 4.1.4, because the Phocean colonists had first sailed to Ephesus for godly advice. Incidentally, the text implies that the location for the city was chosed based on its natural harbour potential, because the Phoceans had set sail purposely seeking somewhere to colonise, and they found a good anchorage on that site. It was not always the case, though, that cities were founded ex nihilo. For example, Strabo, 5.1.11 states that Ariminum was a foundation of the Umbri, but it received Roman colonists later. Incidentally, the port of Ariminum was at the mouth of the river of the same name (present-day fiume Marecchia).

Toponymy might sometimes provide clues in relation to the colonisation of a territory via its ports. For instance, Strabo, 3.1.9, documents a certain Port of Menestheus in Iberia.[140] This port is named after a Greek mythical character, thus hinting at contacts between the colonists and the native population. However, the majority of the mythical toponymy is based either on gods or honorific legends and characters (such as Pausanias, 2.2.3 or

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[138] 11.4.1 in other editions.
[139] 9.63 in other editions.
[140] The exact location is uncertain, but out of the context of the literary sources, it was somewhere near present-day Cádiz.

3.25.4; more generically the Port of the Gods, in Strabo, 17.3.9). Incidentally, Limen can become a toponym itself. For example, a location called the Limen of the Achaeans appears repeatedly in the literature (e.g. Strabo, 13.1.32; Appian, *Syrian War*, 112-113;[141] Appian, *Mithridatic War*, 333-334).[142] That town was said to be the place where the Greeks had their camp in the war against Troy.

4.1.5 Further information to be found in ancient literature:

4.1.5.1 Harbours as places for imperial glorification: the Sebastos port

A number of texts show λιμένες/limenes as monuments in honour of the Roman emperor or other ruler. A paradigmatic example of that is Caesarea Maritima in Judaea.[143] Herod built this port in the Graeco-Roman way, and in so doing, he was clearly seeking to please his Roman patrons, who had made him client king of Judaea. The descriptions provided by Flavius Josephus are more than clear in this aspect, and it is particularly significant that Herod included a Caesareum within the port.[144] This is not so much relevant for the type of building (there were other *Caesarea* in the Empire, including that at Alexandria), but for the cultural zone within which it was established. Indeed, it was a temple in honour of a deified foreign ruler within *the* monotheistic territory. The two concepts might seem difficult to reconcile, but as the story of Rabban Gamliel in the baths of Aphrodite goes (*Mishnah Avodah Zarah* 3:4), "that which is treated like a god is prohibited, but that which is not treated like a god is permitted". The Jews must have considered the temple more like an honorary distinction to Caesar Augustus rather than an actual place for religious cult. Veiled praise to the emperor is implicit in the name of the port complex itself: Sebastos (the Greek adaptation of the title Augustus). The construction of such a magnificent harbour was certainly a motive for self-glorification, and it was certainly displayed, for example, when Herod was visited by Agrippa (Flavius Josephus, *Antiquities of the Jews*, 16.13).[145] The name Sebastos is recorded by the same author in *Jewish War*, 1.613.[146] Another case of imperial self-glorification taking place at a harbour is the

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[141] 5.23 in other editions.

[142] 11.77 in other editions.

[143] For Caesarea Maritima, Holum et al. (1999).

[144] The Caesareum was originally a temple in honour of the deified Julius Caesar, but later on it became by extension a celebration of the Julio-Claudian dynasty.

[145] 16.2.1 in other editions.

[146] 1.31.3 in other editions. The same passage is recorded as well in *Antiquities of the Jews*, 17.87, or 17.5.1 depending on the editions.

narration of the triumph of Pompey, where 700 ships were brought into Ostia for the celebrations (Appian, *Mithridatic War*, 569).[147]

4.1.5.2 λιμήν *meaning market-place*

One regional variation in meaning stands out: it is documented that in Thessalian Greek λιμήν/limen signifies 'market-place', as an equivalent of ἀγορά. This can be seen in the inscription *IG* 9.2.517, ll. 41-42 (Larissa, 214 BC), and potentially also in *SEG* 37:494, preserved lines 2, 6 and 11 (Itonion, 230-200 BC although the inscription is quite broken), as well as Dio Chrysostom, 11.23b (40-120 AD).

Figure 16. Locations of Larisa and Itonion in Thessaly.

At least one example of the same semantic swap is documented with the term ἔνορμος/enormos in Thessaly (Hesychius, epsilon, 3252) and at least one case of λιμήν/limen meaning ἀγορά is also documented in Paphos (Hesychius, lambda, 1033). Helly (1991) and García Ramón (1997) provide discussion in this aspect. García Ramón (1997 : 531-532) discusses this by drawing a comparison of dubious relation with the Λιμναί square in Sparta, and concludes that «originally, the square or meeting place must have been located near a wet zone, either a pool or a lido, or simply next to the port». While the pool hypothesis may be valid for the particular case of Sparta (Λιμναί < λίμνη

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[147] 17.116 in other editions.

'pool, lake, lagoon') I certainly do not believe that this was the general case. The 'pool' statement cannot be generalised without stronger evidence, because it risks falling into the field of an unfounded folk etymology. Instead, the semantic change must have happened by virtue of a metathesis, as shown in the diagram below:

ἀγορά = 'market place'   λιμήν = 'harbour'

                              λιμήν = 'market-place'

ἀγορά = 'that which is brought through the harbour to be sold in the market, supplies'

Indeed, while the original meaning of the word ἀγορά was referring to the market place (the best example being Xenophon, *Economics*, 8.22), the term is also documented with the meaning of 'food supplies brought in through the harbour', as in Plutarch, *Pompei*, 76.1, because these supplies would then be sold in the market-place (cf. Philostratus, *Life of Apollonius*, 5.20, where the merchant is accused to bring the statues to the λιμένες/limenes and thence to the ἀγοραί/agorai). Therefore, it is easy that speakers felt the need to differentiate the ἀγορά/agora 'supplies' from the ἀγορά/agora 'market', and resorted for the latter case to the other public space where the supplies were dealt with, i.e. the λιμήν/limen, resulting in λιμήν/limen taking over the semantic space of 'market-place' from ἀγορά in some regions.

4.2 EPINEION

4.2.1 Introduction

Together with ἐμπόριον/emporion, ἐπίνειον/epineion has a function-based sense. Rougé (1966 : 107-108) explained the term in the following way: *«… [sc. ἐμπόριον/emporion and ἐπίνειον/epineion] have a sense in some sort economical and not technical. […] The ἐπίνειον/epineion is a harbour that is economically dependent on another town, or that, in addition to its own economic activities, it is the trading harbour of another town. […] For [Strabo, Pausanias, Cassius Dio], when they employ this term, it always corresponds to a harbour located at some distance from a town, that uses it for its maritime relations».* Rougé also recalls the definition found in the *Suda*, which I will discuss below. I would label the relationship between the ἐπίνειον/epineion and its related town as political, rather than economical, but Rougé's observations are certainly correct.

4.2.2 An etymological note:

The etymological dictionary of Chantraine quotes the word under the lemma ναῦς, but it provides little more information than mentioning its appearance in Herodotus and Thucydides.

Indeed, the main lexeme is that of ναῦς 'ship'. There are many ancient instances of this root with e-vocalism.[148] Chantraine thus hypothesises an original root *ναF- that would have evolved into *νη(F)-. Although he is right in his interpretation, this issues may need some further explaining.[149]

The starting point is an Indo-European noun *nāw, which is also present in other languages, like Latin *nauis* or hindi *nau-*, etc. Of the many ancient Greek dialects, the word ἐπίνειον/epineion belongs to Attic (i.e. from the region of Athens). In this dialect, as well as in Ionic (i.e. the Mediterranean coast of present-day Turkey), $\bar{a}$ results in $\bar{e}$, and is therefore spelled η. This explains forms such as those we can find in the Homeric poems (e.g. νῆες). Still, the word ἐπίνειον/epineion is spelled with an epsilon, so a short vowel.

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[148] For example, in Homer: νηΐ, νηῷ, νῆες, νῆας, νηῶν, νήεσσι, etc.
[149] I thank Prof Ignasi Xavier Adiego Lajara, from the University of Barcelona, for his valuable feedback on the change between alpha and eta vocalism.

Why this change? In the case of pre-historic Greek (and also Indo-European), we have to postulate a rule (Osthoff's Law)[150] by which a long vowel followed by a sonant (i, u, r, l, m, n) plus another consonant would become shortened. Thus, we have in historic Greek a nominative ναῦς with a short alpha. The correct process for the word 'ship' would be that the shortening of the vowel takes places first, and this is why the nominative ναῦς has not suffered the vowel change due to Osthoff's law. Osthoff's law, however, does not apply to all dialects, and thus we have an Ionic nominative νηῦς.

Let us examine now the –νειον lexeme in the compound ἐπίνειον/epineion. The starting point is now and adjectival root *nāwyo-, which in Greek would result in *νᾱϝιο-. However, the digamma was lost, thus producing the word *νᾱιο-.[151] At this stage, in the case of the adjective, and in the case of the Attic and Ionic dialects, the rising of the vowel would take place. In other words, alpha would become eta. Then because of contact with the iota, the eta would be shortened to epsilon, thus resulting in the adjectival form –νειον, which is however only preserved in compounds like ἐπίνειον/epineion. Figure 17 should help visualise the process:


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Indo-European adjectival root:

        *nāwyo-
          │
          ▼ Greek
                                                    Osthoff's law
                                              long vowel  +  sonant
                                                    │         │
                                                    ▼         ▼
*νᾱϝιο-  [loss of digamma]  *νᾱιο-  [vowel change]  νήιος
                                                        │
                                                        ▼
                                              (ἐπί)νειον
```
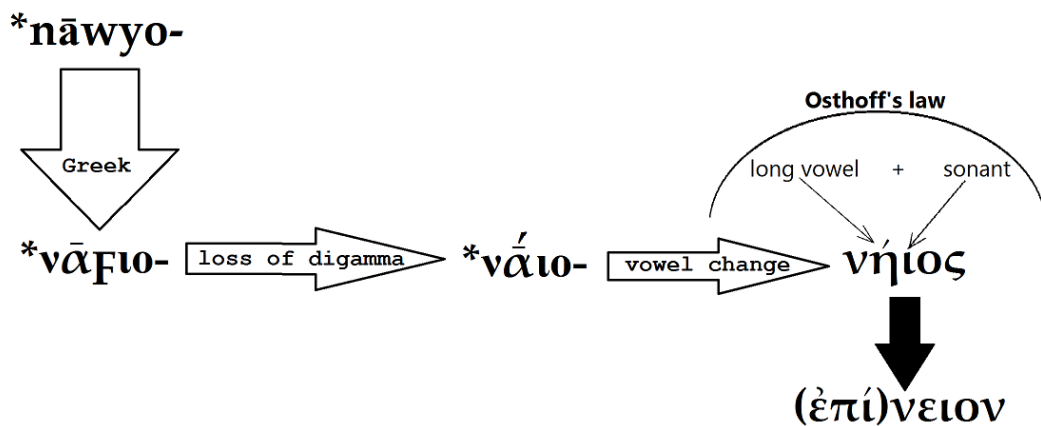
Figure 17. Etymology of ἐπίνειον/epineion

With this summary, I believe that the second part of the word is clear. Why the preposition ἐπί would be added to it is more difficult to explain. In fact, defining the exact meaning of

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[150] The rule nowadays commonly known as Osthoff's Law was not originally adscribed to any scholar. However, nowadays it has acquired this name in honour of Hermann Osthoff, who first formulated it in 1879, 1881, and 1884. The definitive formulation of this law can be found in Osthoff (1884), pp. 84-85. For further discussion, Collinge (1985) pp. 127 ss.

[151] Incidentally, this is the resulting form in the Dorian dialect, where ᾱ does not result in η.

a preposition is highly complicated in any language. Prepositions being function words, their usage (rather than meaning) may be pure logic to the native speaker but in fact, when we look them up in the dictionary, we find an extremely wide range of possible definitions. The possibility that seems most plausible as to the use of ἐπί in ἐπίνειον/epineion is its meaning as 'on', as we can see for instance in verse 265 of the third book of the *Iliad*:

Homer, *Iliad*, 3, 264-266
Ἀλλ' ὅτε δή ῥ' ἵκοντο μετὰ Τρῶας καὶ Ἀχαιούς,   ἐξ ἵππων ἀποβάντες ἐπὶ χθόνα πουλυβότειραν   ἐς μέσσον Τρώων καὶ Ἀχαιῶν ἐστιχόωντο.
When [Priam and Antenor] arrived with the Trojans and the Achaeans,   they dismounted their horses and stood on the fertile ground   in the midst of the lines of the Trojans and the Achaeans.

Let's not forget that the −νειον root is an adjectival form, so the word could have started as something like going or trading or mooring or even governing "ἐπὶ τὸ νείον", i.e., "on the naval (area)". From there the whole expression would be contracted to ἐπίνειον/epineion and employed in reference to the whole harbour site.[152] The formation ἐπίνειον/epineion might have existed since very ancient times as a compound on its own, in a similar word-structure to other forms that we still use in modern languages, such as English *offshore* or Italian *lungomare*.

Appian employs the term ἐπίνειον/epineion with adjectival value a couple of times (*Prooemium*, 61[153] and *Punic Wars*, 470 [154]), which is significant. This proves that a fortress by the sea would be marked as an "ἐπίνεον-fortress", rather than, for example, a "λιμήν-fortress", because ἐπίνειον/epineion was at one point perceived as an adjective as well as a noun. Cf. κακός 'bad, evil, disastrous' − τὸ κακόν 'badness, the evil, disaster'.

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[152] Other relevant values of ἐπί are those of immobility and accumulation/distribution. Cf. respectively Homer, *Il.* 6. 354 and Thucydides, 2.90.1. Another relevant detail is that many maritime verbs employ ἐπί as a prefix thus slightly changing their meaning to "to sail to one specific place" or even "to come to mooring". See, for example, ἐπιπλέω or ἐπινήχομαι.

[153] Edition by E. Gabba, A.G. Roos, and P. Viereck. Instead, this is passage 15 in the editions by Mendelssohn and White. According to Dr Hopkins, «Appian used φρουρά for abstracts like garrison or guard duty, and the word commonly means men who serve in this role. […] This unique phrase therefore suggests something like a coastal or port watch.»

[154] 470 in the edition of Gabba, Roos and Viereck; 100 in the editions of Mendelssohn and White.

4.2.3 Ancient definitions of the term ἐπίνειον

Three documents explaining the word ἐπίνειον/epineion are extant. The first one is a definition in the *Suda* that Rougé also used:

Suda, epsilon 2489	
Ἐπίνειον: παρὰ τὸ ἐν αὐτῷ νήχεσθαι τὰς ὁλκάδας καὶ ὀκέλλειν. ἢ πόλισμα παραθαλάσσιον, ἔνθα τὰ νεώρια τῶν πόλεων εἰσιν· ὥσπερ Πειραιεὺς τῶν Ἀθηναίων καὶ Νίσαια τῆς Μεγαρίδος. δύναται δὲ ἐπὶ παντὸς ἐμπορίου καὶ παραθαλασσίου χρήσασθαι τῷ ὀνόματι τούτῳ, ὃ νῦν οἱ πολλοὶ κατάβολον καλοῦσιν.	*epineion*: in this [place] cargo ships float and run aground. Or else, maritime village where the shipsheds of the cities are, like Piraeus for the Athenians and Nisaia for the region of Megara. You can use this name for any maritime *emporion*, this is what now most people call *katabolos*.

The other cases are found in scholia, two from Thucydides and one from Aristophanes. Note, though, that the *Suda* seems to be an expanded copy of the scholia to Thucydides or else the scholia were copied from the *Suda*.

scholion to Thucydides, 1.30.2[155]	
ἐπίνειόν ἐστι πόλισμα παραθαλάσσιον, ἔνθα τὰ νεώρια τῶν πόλεων εἰσίν, ὥσπερ Πειραιεὺς τῶν Ἀθηναίων καὶ Νίσαια τῆς Μεγαρίδος· δύνασαι δὲ ἐπὶ παντὸς ἐμπορίου καὶ παραθαλασσίου χρήσασθαι τῷ ὀνόματι τούτῳ, ὃ νῦν οἱ πολλοὶ κατάβολον καλοῦσιν.	An *epineion* is a maritime village where the shipsheds of the cities are, like Piraeus for the Athenians and Nisaia for the region of Megara. You can use this name for any maritime *emporion*, this is what now most people call *katabolos*.

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[155] Thuc. 1.30.2 reads as follows: ὕστερον δέ, ἐπειδὴ οἱ Κορίνθιοι καὶ οἱ ξύμμαχοι ἡσσημένοι ταῖς ναυσὶν ἀνεχώρησαν ἐπ᾿ οἴκου, τῆς θαλάσσης ἁπάσης ἐκράτουν τῆς κατ᾿ ἐκεῖνα τὰ χωρία οἱ Κερκυραῖοι, καὶ πλεύσαντες ἐς Λευκάδα τὴν Κορινθίων ἀποικίαν τῆς γῆς ἔτεμον καὶ Κυλλήνην τὸ Ἠλείων ἐπίνειον ἐνέπρησαν, ὅτι ναῦς καὶ χρήματα παρέσχον Κορινθίοις.

scholion to Thucydides, 2.84.5[156]	
ἐπίνειον καλεῖται πᾶν ἐμπόριον, ἢ παρὰ τὸ ἐπινήχεσθαι αὐτὸ τῇ θαλάσσῃ, ἢ παρὰ τὸ ἐν αὐτῷ τὰς ὁλκάδας νήχεσθαι ἢ ὀκέλλειν.	*epineion* is the name for every *emporion*, either the very fact of floating on the sea, or the fact of ships sailing into it or are towed aground.

Scholion to Aristophanes's Peace (scholia vetera et recentiora Triclinii) *Argumentum-dramatis personae-scholion sch pac,* verse 483b [157]	
ἢ ὅτι εἰς πολιορκίαν κατέστησαν αὐτοὺς οἱ Ἀθηναῖοι τὴν Νισαίαν τειχίσαντες, ὅπερ πρὸς τῇ θαλάττῃ τῶν Μεγαρέων ἐπίνειον ἦν ἀπέχον οὐ πολὺ διάστημα ἀπὸ τῆς τῶν Μεγαρέων πόλεως.	the fact that the Athenians put them under siege by building walls around Nisaia, the very place by the sea where there was the *epineion* of the Megarians, which was not very far away from the city of the Megarians.

From the previous quotes we can infer the following:

➤ The *Suda* and the scholia to Thucydides clearly state that the word ἐπίνειον/epineion can be applied to any maritime ἐμπόριον/emporion, thus highlighting a commercial function.

➤ The *Suda*, the first scholion to Thucydides and the scholion to Aristophanes also confirm that an ἐπίνειον/epineion is situated away from the city that effectively profits from it.

➤ The *Suda* and the first scholion to Thucydides use the examples of Piraeus-Athens and Nisaia-Megara. These examples recur in other sources, as shown later.

➤ The second scholion to Thucydides makes a clear point that in an ἐπίνειον/epineion ships can either ride at anchor in the sea (here expressed with the idea of "floating": ἐπινήχεσθαι) or else get into the port if they need to (literally "swimming" – νήχεσθαι and "towing into port" – ὀκέλλειν).

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[156] The relevant sentence in Thuc. 2.84.5 reads as follows: παρέπλευσαν δὲ καὶ οἱ Πελοποννήσιοι εὐθὺς ταῖς περιλοίποις τῶν νεῶν ἐκ τῆς Δύμης καὶ Πατρῶν ἐς Κυλλήνην τὸ Ἠλείων ἐπίνειον.

[157] Ar. *Pax* vv. 481-483 read as follows: ΤΡΥΓΑΙΟΣ: οὐδ' οἱ Μεγαρῆς δρῶσ' οὐδέν: ἕλκουσιν δ' ὅμως // γλισχρότατα σαρκάζοντες ὥσπερ κυνίδια – // ΕΡΜΗΣ: ὑπὸ τοῦ γε λιμοῦ νὴ Δί' ἐξολωλότες.

> From the scholion to Aristophanes we can deduce that an ἐπίνειον/epineion was a strategic point to besiege as a matter of priority during a war. If we read the passage in Aristophanes, we will see that the Megarians are "dying of hunger" (ὑπὸ τοῦ γε λιμοῦ νὴ Δί᾽ ἐξολωλότες.). One cannot help wondering, though, if ἐπίνεια/epineia had any defensive structures due to their obvious relevance as points for commerce (and hence food and supplies distribution).

The definition of Hesychius is inexact in its relationship to the rest of the literary corpus. It could be that ἐπίνεια/epineia were considered smaller than λιμένες/limenes, but that is not a sine qua non condition. Even if the ἐπίνειον/epineion was small, this could also be due to its condition as a subordinate port:

Hesychius, *Lexicon*, epsilon 5008	
ἐπίνειον· μικρὸς λιμὴν	*epineion*: a small *limen*.

4.2.4 Main characteristics of the ἐπίνειον

As mentioned above, during this research I reached the same conclusions as Rougé (1966), partly because we used the same sources, as we are focusing in the same time period. If the study was focused on earlier harbours or later ports, the results might have been somewhat different, although probably not significantly so. In this sense, one wonders when the term ἐπίνειον/epineion penetrated the regular vocabulary. There are no results in Homer or Hesiod when searching for this term. In Herodotus, ἐπίνειον/epineion appears only once (6.116). It also appears only once in the periplus of Pseudo-Scylax (109), although that text sometimes employs such expressions as: "port X, but going inland there are other towns" (e.g. 26, 34, 35). That port could be considered an ἐπίνειον/epineion of the inland towns, since those would have had no direct access to the sea and would have been supplied by the first port, even though the specific term ἐπίνειον/epineion does not figure in the original text of Pseudo-Scylax.

Before examining the maritime data, it should be noted that an ἐπίνειον/epineion is not exclusively located by the sea. There are a number of documents referring to ἐπίνεια/epineia ports situated by the side of lakes or rivers, such as Strabo, 14.5.10 or

Appian, *Hannibalic war*, 30.[158] The basic characteristic of a port called ἐπίνειον/epineion is its relation of dependence, while it is also nearly always a civilian centre.

4.2.4.1 The ἐπίνειον-type harbour as dependent on another town some distance away from it

Ancient literature establishes a clear difference between the ἐπίνειον/epineion and the city that actually profited from it. This is shown by means of distinct toponyms (Kenchreae – Corinth; Ostia – Rome) or by simply explaining that the port was elsewhere, as in Dionysius of Halicarnassus, 9.56: a πολίχνη τις ἐπιθαλάττιος containing an ἐπινείῳ τε καὶ ἀγορᾷ which was eventually destroyed by the Romans.

A few examples will suffice as further illustration of this dependent relationship. We can read in several passages explicit distinctions between coastal towns (the ἐπίνεια/epineia) and the cities controlling them. These include: Pausanias, 1.1.2 (Piraeus and Phaleron in respect to Athens); Strabo, 8.1.13 (Nisaia in relation to Megara), 8.3.4 (Cyllene to Elis) and 8.3.12 (Gytheion and Sparta). I would also like to point out the occurrence of phrases like τῶν πόλεων καὶ τῶν ἐπίνειων δηλώσομεν (e.g. Marcianus, *Periplus Maris Exteri*, 1.10 and 2.46: 'we will show the cities and the *epineia*') and even πόλεων παραθαλαττίων καὶ ἐπινείων ('the cities by the sea and the *epineia*', ibidem, 1.2), as these suggest that there is some distance between the harbours and the towns that were the final destination of the merchants.

The question of why a certain town would need an ἐπίνειον/epineion is usually best explained because the town is situated somewhat inland. Athens, Megara and Sparta are all at a distance from the coast. The same thing is noted in many other passages. As further examples, see Appian, *Civil War*, 4.10.81-82 (Patara-Xanthos) or Appian, *Syrian War*, 123-124 [159] (Elaia-Pergamon), as shown in Figure 18.

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[158] Ed. Gabba, Roos and Viereck; but passage 7 in the editions of Mendelssohn and White.
[159] Passage 124 in the edition of Gabba, Roos and Viereck, but 26 in the editions of Mendelssohn and White.

Figure 18. Maps indicating the positions of ἐπίνεια/epineia.

Similarly, in some cases, the major town is already situated by the sea, but it still makes use of an ἐπίνειον/epineion. This may be due to several reasons. First and foremost, if the major town does not have good geographical conditions for a port, as in the case of Arados in Strabo, **16.2.12-13** (present-day Arwad in Syria). On other occasions, the ἐπίνειον/epineion is situated at a more advantageous location than the controlling town, which itself has a port. This is so that it allows to expand the physical space of the harbour at the controlling town. That would be the case in the system Eribolon-Nicomedia, in present-day Turkey (Cassius Dio, **78.39.3**). Finally, in other instances the ἐπίνειον/epineion could guarantee a stopover before reaching the main port, for example to unload part of the cargo or because the ἐπίνειον/epineion has better geographical

facilities than the main port, or simply in case of bad weather or adverse winds. Such might be the situation of Misoua-Carthage (Procopius, 4.14.40, Figure 19).
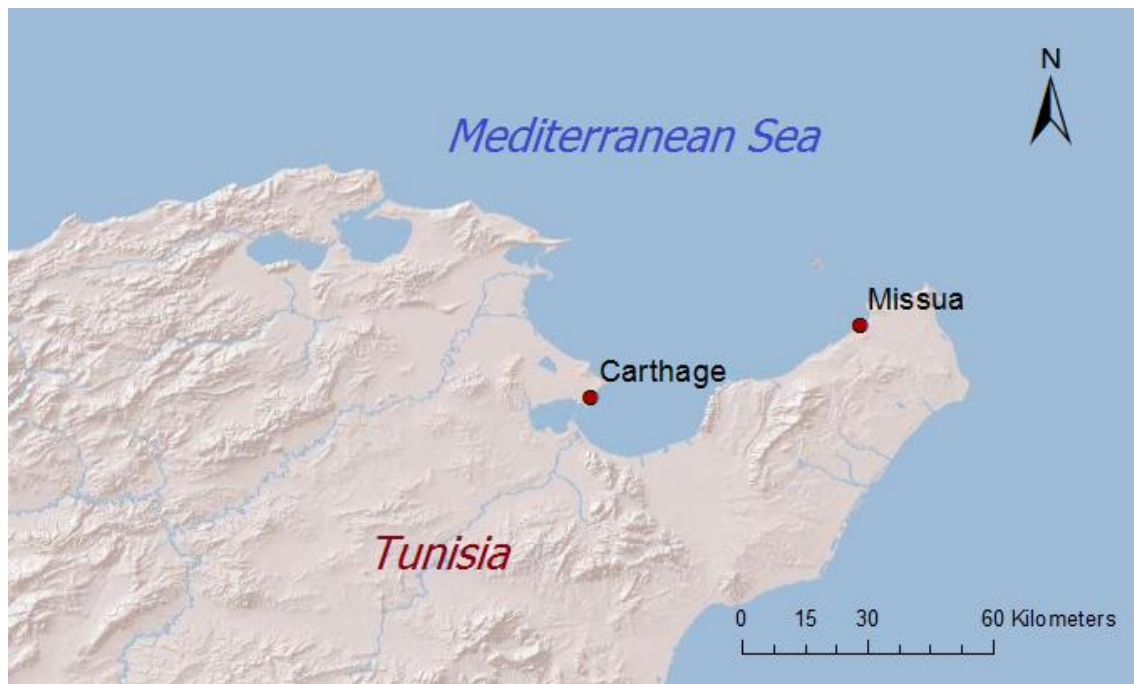
Figure 19. Locations of coastal towns with ἐπίνεια/epineia.

Finally, it is interesting to note that in some cases the ἐπίνειον/epineion is so strongly dependent on the city controlling it that only the name of the major city or its inhabitants is given instead of that of the harbour location. Several passages are illustrative of this:

- Pausanias, 8.10.4: "the *epineion* of the Mylasians".

- Pausanias, 8.14.12: "the *epineion* of the Elaeans".

- Strabo, 9.2.28: "Thisbe … has an *epineion*".

- Pausanias, 7.26.1: "the *epineion* of the Aigeiraeans – both the city and the *epineion* have the same name" (note that in this case Pausanias wants to disambiguate that he is referring to the port and not to the whole town of Aigeira).

Pausanias, 1.44.3 is less obvious. It documents an acropolis in the ἐπίνειον/epineion town of Nisaia.[160] As seen above, Nisaia was the ἐπίνειον/epineion of Megara, which in this case is implicit. This probably has to be understood as a clue to the crucial importance achieved by port towns. The same idea is found in the case of ἐπίνεια/epineia linked to towns that used to be of certain importance, but that in time have become abandoned. But, contrary to that, the ports of those towns were by no means forsaken thanks to their continuous economic activity (e.g. Strabo, 5.2.6: Poplonium). Sometimes they also document changing power centres, like Pausanias, 2.36.2, explaining that Mases used to be autonomous, but in his time it was an ἐπίνειον/epineion.

Surprisingly, geomorphological features are rarely made explicit. Amongst all the material chosen for this thesis, only marginal and late sources, such as etymological compilations and scholia, refer to this. For example, the *Etymologicum Magnum*, s.v. *Γέραστος*, where the site is defined as a promontory and an ἐπίνειον/epineion, or the *Scholion to Demosthenes*, 9.37, reporting an ἐπίνειον/epineion called "the Strait".

4.2.4.2 The ἐπίνειον as a civilian, not military, function port

Some passages are so ambiguous as to the function of ἐπίνεια/epineia, to the point that one might wonder if ἐπίνεια/epineia were military installations. However, this question is due to the nature of our sources: historical sources tend to record major events, like wars, rather than everyday ordinary activities like the transport of foodstuffs and other cargoes. Yet it is still possible to find explicit mentions of cargo ships, thus making the commercial function of the ἐπίνεια/epineia obvious. Despite a possible military presence, I would

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[160] Paus. 1.44.3: ἐς δὲ τὸ ἐπίνειον, καλούμενον καὶ ἐς ἡμᾶς ἔτι Νίσαιαν, ἐς τοῦτο κατελθοῦσιν ἱερὸν Δήμητρός ἐστι Μαλοφόρου [...]. καὶ ἀκρόπολίς ἐστιν ἐνταῦθα ὀνομαζομένη καὶ αὐτὴ Νίσαια, "To the epineion, which is called Nisaia still in our times, going down to that place there is a temple to Demeter Malophoros [...]. And there is an acropolis in there, which is also called Nisaia".

argue that an ἐπίνειον/epineion was not a port primarily intended for the uses of the army, but as a commercial facility.

For example, Strabo, 3.2.6, lists explicitly exports from Turdetania (a region in present-day Southern Spain), that were exported to Ostia, the ἐπίνειον/epineion of Rome. In this way the ἐπίνειον/epineion at Ostia is revealed as the place that received the commercial exports. Similarly, Dionysius of Halicarnassus, 9.56.5-6 , puts the ἐπίνειον/epineion in relation to an ἀγορά, a market-place. At the same time, the fact that ἐπίνεια/epineia were potential targets for military action is proof of their wealth, commercial might and strategic location. Less explicitly, Philo Judaeus, *Against Flaccus* 155 refers to a ferry that transports people from Kenchreae (the ἐπίνειον/epineion of Corinth) to Piraeus (incidentally the ἐπίνειον/epineion of Athens). In his text, he refers to the place where the "guards" (*phylakes*) are. This is a clear example, not of military occupation, but rather of police: indeed, ports where large commercial activity took place would have required a security corps to avoid conflict and ensure payment of taxes. In the same sense, Strabo, 4.1.12 shows that the commercial function of an ἐπίνειον/epineion was of extreme relevance, not only to the city using it, but even to the whole region: he describes Narbo as the ἐπίνειον/epineion of the whole Gaul.

Therefore, trade must be put at the centre of the function of ἐπίνεια/epineia. This involves a number of things. First and foremost, apart from the obvious mooring facilities, a physical space for commerce is needed. Texts discussed above mention the words ἐμπόριον/emporion and ἀγορά/agora. But since the ἐπίνειον/epineion is just a satellite for the maritime access of a larger town, means of transportation of these goods to their final destination needed to have been on place. Thus, good roads, transhipment zones or other kind of infrastructure are likely to be present. The literature, however, is not very prolific in documenting them.

Given that taxes on wares such as those transacted in the ἐπίνεια/epineia had been existing since very ancient times, tax offices are to be expected. For instance, Aristophanes (*Frogs*, 362-364) speaks about taxes on trade resulting in smuggling, thus providing an example *a contrario* that those taxes were effectively in place.[161] Indeed, a tax system meant that there

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[161] […] ἢ τἀπόρρητ' ἀποπέμπει // ἐξ Αἰγίνης Θωρυκίων ὢν εἰκοστολόγος κακοδαίμων, // ἀσκώματα καὶ λίνα καὶ πίτταν διαπέμπων εἰς Ἐπίδαυρον. "[he who betrays the state] or sends contraband from Aegina, like Thorycios, that damned tax-collector, sending leather pads [for the rowlock] and sails and pitch to Epidauros".

needed to be customs in the port to control the goods and collect the money. Unfortunately, this kind of infrastructure is not easily identifiable from archaeological excavations. Some epigraphical documents do provide evidence for tax collection at ports,[162] but it was difficult to find any reference to them in the written sources selected for this project. The main problem is that such technical terms as εἰσφορά (which roughly translates as "contribution") are not sea-faring specific,[163] and in those cases where the sources refer to ports, our project is restricted to the Mediterranean area, something that quite narrows the scope, as a comparison with other maritime environments is not straightforward.[164]

Trade played a huge economic role in port contexts, but it was not the only source of activity. It is not often, however, that ancient authors provide indications of fishing facilities, but Strabo documents look-outs for tuna fish in a couple of ἐπίνεια/epineia, namely Poplonium (5.2.6) and a so-called Heracleus Limen, below Cosa (5.2.8).[165] Those were places where one of the fishermen would set himself to watch out so he could signal to his fellow fishers when the tuna arrived.

As the ἐπίνειον/epineion was the port used by a different town from the one it is located in, two interesting questions arise:

1.   Can one same town have more than one ἐπίνειον/epineion?
2.   Can one same ἐπίνειον/epineion be used by more than one town?

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[162] See, for instance, the following inscriptions from Ephesus documenting the presence of τελωνεία: Firstly, the one to be found in Curtius, Hermes 4, 1870, 186-189, no. 5; Wood, App. 8, no. 12; GIBM 503; OGIS 496; Vidman, Syll. 301; Hüttl 352; Hölbl, Zeugnisse p. 52, no. 6; *IEph 1503: Ἀρτέμιδι Ἐφεσίᾳ] / καὶ Αὐ[τοκράτορι Τ(ίτῳ) Αἰλί]ῳ /Ἀδριανῷ Ἀντωνείνῳ / Καίσαρι Σεβαστῷ Εὐσεβεῖ / καὶ τῇ πρώτῃ καὶ μεγίστῃ / μητροπόλει τῆς Ἀσίας / καὶ δὶς νεωκόρου (sic) τῶν Σεβαστῶν / Ἐφεσίων πόλει καὶ τοῖς ἐπὶ τὸ τελώνιον τῆς ἰχθυϊκῆς / πραγματευομένοις / Κομινία Ιουνία / σὺν τῷ βωμῷ τὴν Εἶσιν / ἐκ τῶν ἰδίων ἀνέθηκεν· /πρυτανεύοντο[ς Τιβ(ερίου) Κλ(αυδίου) Δ]ημ[οσ]τ[ρ]άτ[ου.]. Secondly, Vetters, AAWW 114, 1977, 211; Vetters, AAWW 116, 1979, 133; Engelmann & Knibbe, EA 8, 1986, 19-32; SEG 36, 1027; *Engelmann & Knibbe, EA 14, 1989, 10-31: ἐνεχύρου λῆψις ἔστω. ἐν οἷς ἂν τόποις κατὰ τον τὸν νόμον τελώνιον δημοσιώνου ὑπάρχῃ, ἐν τοῖς τόποις τούτοις τέλος ἢ μισθὸν.
[163] For εἰσφορά, cf. Plato, Laws, 744b; Dinarchus, Against Demosthenes 69.
[164] There is, for instance, a τελώνιον documented in Schedia, in Egypt, but that is a river port.
[165] I am aware that the word in the text is λιμήν, not ἐπίνειον. But note the previous statement that Cossae is some distance from the sea.

4.2.4.3 One town, many ἐπίνεια?

Let us start with the first question. Athens did use several ἐπινεια: Piraeus, Phaleron and Munychia (see Pausanias, 1.1, partially quoted above, although Munychia could arguably be considered part of Piraeus). The case of Rome is less clear, as Ostia and Portus are very close to one another and Portus is sometimes included as a part of Ostia in the ancient literature. However, the existence of a larger system including Centumcellae and Puteoli is highly probable as well.[166] Corinth has an ἐπίνειον/epineion on either side of the isthmus: Kenchreae in the East and Lechaeum in the West (Pausanias, 2.2.3). Similarly, Pausanias, 4.3.10 reports of Messenia having several of them. A similar passage is to be found in a letter by Synesius (epistle 148), a bishop of Ptolemais in Cyrenaica who died ca. AD 414. In this passage, the ἐπίνεια/epineia are those of the whole region of Cyrenaica, something that emphasises the economic activities and benefits in relation to the whole territory, in line with Strabo's comment on Narbo on 4.1.12.

Finally, Achilles Tatius, 2.17.3 seems to suggest that, in the case where a town has an ἐπίνειον/epineion *besides of* its own port, the latter might be devoted to piracy or illegal market.

4.2.4.1 Many towns, one ἐπίνειον?

With the cases that we have read above it is clearly possible for one town to make use of several other ports. But is the reverse situation possible? A priori, the situation is not impossible. If a port is situated in a suitable location and within a reasonable distance of two or more towns, it is difficult to see why only one of them would use it. In this sense, Strabo, 5.4.8 reports on the situation of Pompeii in relation to Nola, Nuceria and Acherrae, shown on Figure 20 . The coastline in Pompeii has now changed, but proof that it used to be a good port is provided by the find of mooring rings on site.[167]

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[166] Keay et al. 2012.
[167] For an image, see Beard (2008), p.17.
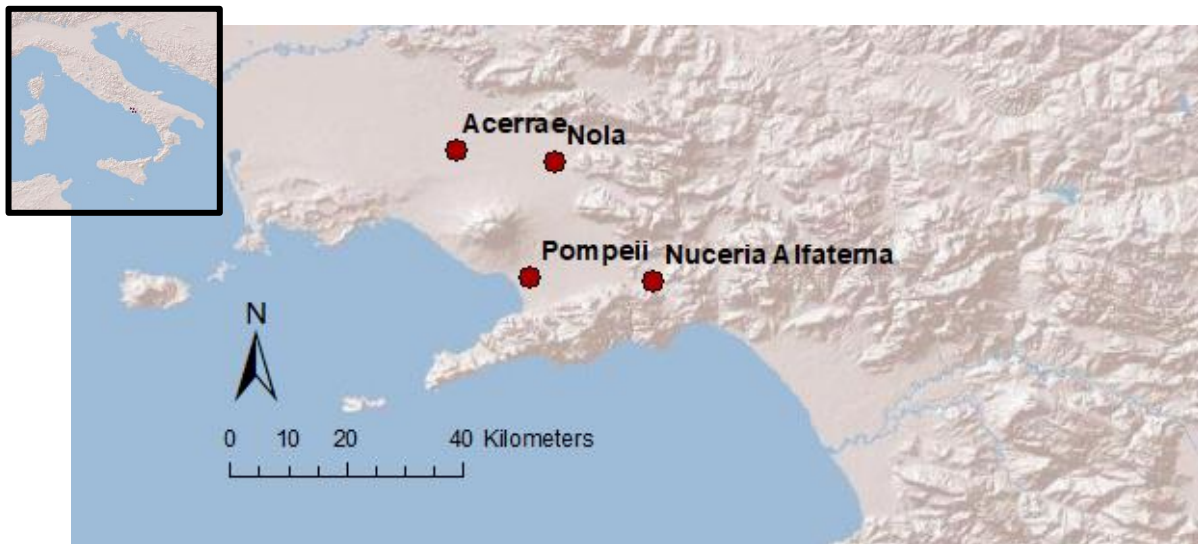
Figure 20. Towns benefitting from the ἐπίνειον/epineion at Pompei

Another example is Strabo, **5.4.2**, but it is somewhat more complicated because here Strabo mentions tribes rather than cities: the Vestini, the Peligni and the Marrucini. The coastal town that he refers to, Aternum, is present-day Pescara in Italy.

I have been unable to find any more literature documenting one same ἐπίνειον/epineion being used by different towns explicitly, but I believe that the textual evidence adduced so far is sufficient to demonstrate that this did occur.

4.2.5 Further information to be found in ancient literature:

4.2.5.1 Distances

Distances are an issue that is worth some attention. Indeed, an ἐπίνειον/epineion is dependent on a different town, but how far apart are the two locations? A few passages inform about the distance between the ἐπίνειον/epineion and the town that used it. Distances are given in the several authors in stadia.

It is not the purpose of this thesis to discuss how long a stadium is in meters or kilometres,[168] so I will keep on referring to the distances in the ancient unit. Indeed, the value of the stadium depends on too many difficult variables, and it is not clear that it was a fixed

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[168] The modern equivalent of a stadium is a major issue, see Hultsch (1862 : 31-32) and Arnaud (1993; and id. 2005 : 84-87) for wider discussion. The *LSJ* gives an equivalent for a stadium of 606 ¾ English feet. Bailly's dictionary provides an equivalence of 1 stadium = 177,6 meters, roughly the same as its counterpart in Imperial measurements. Whenever equivalents are provided, I shall follow the indications of Bailly, as they are given in the international system.

amount. Perhaps because of this reason, in some occasions the ancient sources give their values with a ὅσον, roughly meaning "as much as / up to [number] stadia".

The following chart summarises the distances observed for some significant passages, ordering the places from closest to farthest:

stadia	Place A	Place B	source
12	the ἐπινειον	the city above	Pausanias, 7.26.1
15	Opus (metropolis)	the coast	Strabo, 9.4.2
18	Nisaia (the ἐπινειον)	Megara (the capital city)	Strabo, 9.1.4
20? 12?	Sicyon (new city)	Sicyon (ancient city with port)	Strabo, 8.6.25
20	Pasgae, an ἐπινειον	Iolcos	Strabo, 9.5.15
20	Phaleron	Athens	Pausanias, 8.10.4
25	Ceos (tetrapolis)	the sea-shore	Strabo, 10.5.6
30	Pyrgi	the ἐπινειον of the Caeretani	Strabo, 5.2.8
60	Opus (metropolis)	Cynos, its ἐπινειον	Strabo, 9.4.2
60	Pellene	its ἐπινειον	Pausanias, 7.26.14
60	Delphi	Cirra, its ἐπινειον	Pausanias, 10.37.4
80	Mylasa (ἐπινειον)	Mylasa (town)	Pausanias, 8.10.4
90	Pasgae, an ἐπινειον	Pherae, the city using it	Strabo, 9.5.15
120	Elaia (an ἐπινειον)	Pergamon	Strabo, 13.1.67
120	Aegeira	Donussa	Pausanias, 7.26.14

The chart illustrates that a half of the passages show the ἐπίνεια/epineia was relatively close to the city using it (12-30 stadia, ca. 2-5.5 km). Others are somewhat further (60-90 stadia, ca. 10.5-16 km). These would be two levels of shorter distance. However, we can clearly see three cases where the distance is stated as 120 stadia (ca. 21 km), considerably far compared to the lowest level. Unfortunately, I have been unable to locate Donussa with precision, but the distance provided for Elaia-Pergamon is remarkably accurate if we check the two locations on present-day maps. This highlights the great importance of having access to the sea: Pergamon is not close to the coast, but it procured itself an access to the Mediterranean by means of Elaia. The economic benefits of having a gateway to the sea are thus made obvious.

4.2.5.2 A closer look: Pyrgi

At this point I would like to emphasise that the wealth of the ἐπίνεια/epineia transformed these ports into potential military targets. We have seen above the fragment by Dionysius of Halicarnassus (9.56.5-6), reporting the Roman seizure of an ἐπίνειον/epineion after an attack from the Volscians. This action, however, is quite ancient: compare, for example, Thucydides, 1.30.2, where he informs us that Athens destroyed Cyllene, the ἐπίνειον/epineion of Elis, because it had supplied money to their enemy Corinth. Interestingly, Diodorus Siculus, 15.14.3-4 reports of an intentional attack to obtain wealth: Dionysius, the tyrant of Syracuse, was in need for money and attacked Pyrgi in Tyrrhenian Italy, the ἐπίνειον/epineion of Agylle.

In that passage there are two points worthy of notice. Firstly, the name of the place. This ἐπίνειον/epineion is called Pyrgi, which clearly comes from πύργος, the Greek word meaning the tower of a fortification. Thus, the toponym 'Towers' is an indicative that the place must have had defensive walls with towers to watch for enemy ships and protect the population accordingly. Indeed, toponymy is a good indication of the facilities of places. We can compare this passage, for instance, with Strabo, 5.4.2, where he documents places named after the Latin words *castrum* and *castellum*, i.e. fortresses.

The second relevant item in the passage by Diodorus Siculus is the reference to wealth. The booty obtained by Dionysius was considerable indeed: over a thousand talents from the temple and five-hundred more when he sold the booty. Because of the same reason, an ἐπίνειον/epineion was a potential target for piracy,[169].

Diodorus states that the wealth of the ἐπίνειον/epineion at Pyrgi was kept in a temple. In relation to the presence of temples on the coast, it is quite frequent, especially as it was customary for seamen to make votive offerings to the gods begging for a good journey or thanking the divine for a safe arrival at land. In this case, the temple that is mentioned was dedicated to Eileithyia, the goddess of child-birth and home affairs in general (cf. Strabo 5.2.8). Other instances of temples near ἐπίνεια/epineia, can be found, for example, in Strabo, 10.4.8 (this temple is also to Eileithyia), and 10.4.14; Pausanias 1.44.3 or 2.12.2. Thus, the presence of holy shrines near harbours is a fact, in order to suit the religious necessities of sailors, anglers and travellers. Temples sometimes perform the functions of a

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[169] See, for example, Strabo, 16.2.28, and Plutarch, *Life of Pompey*, 24 ss. The opening of 25.1 is especially illustrative of the problem: Ἐπενείματο δὲ ἡ δύναμις αὕτη πᾶσαν ὁμοῦ τι τὴν καθ' ἡμᾶς θάλασσαν, ὥστε ἄπλουν καὶ ἄβατον ἐμπορίᾳ πάσῃ γενέσθαι - *their force was deployed all over the Mediterranean, so that the whole sea became unnavigable and a no-go area for commerce.*

treasury as well. The best-known cases are probably Delphi and the acropolis of Athens in Greece, but it is not surprising that smaller religious buildings should also have minor scale riches kept inside them.[170]

In addition, temples had sometimes a much more essential function for mariners apart from their spiritual well-being: as big structures that could be seen from afar, temples sometimes acted as reference points for mariners. Prove of this is that periploi, such as the *Stadiasmus*, sometimes indicate religious landmarks along their routes. Whether we are speaking of ἐπίνεια/epineia or the ports of large towns, it is clear that temples were sometimes built in strategic places, for instance, as orientation landmarks. This usage of the temple as a geographical indicator can well be illustrated by the temple of Heracles Melkaart, which was located on the Island of Sancti Petri offshore from Gades,[171] and possibly also the temples close to the sea in Leptis Magna. However, depending on the perils of the coast, sometimes other infrastructures were used, especially lighthouses, the best-known one being that of Alexandria,[172] and of course at Portus.

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[170] For the economy of temples, see the interesting work by Dignas (2004). She states, however, (p. 15) that banking activities in temples may have been seen as not conscious or deliberate. Note also p. 16: «Well known is the fact that the Athenians regarded the sacred treasures of their temples, including the votive offerings, as a reserve from which they could draw in the time of need during the Peloponnesian war. Although this picture simplifies matters, it is true that Greek cities borrowed money from their gods». See also Tomlinson (1976) pp. 49-54 and Pedley (2005) pp. 100-118.

[171] Present-day Cádiz in Spain. For details, García Bellido (1964).

[172] Strabo, 17.1.6-7, where he writes a eulogy of the city of Alexandria, explains that the lighthouse was built due to dangerous rocks in the sea. The trouble with the identification of lighthouses is that quite often they are simply referred to as πύργος ('tower'), and it is quite difficult to prove if they had a beacon, particularly if they are no longer extant. I am also aware of ongoing work by J. Christiansen to produce a catalogue of ancient lighthouses, but no information has been published yet.

4.3 EMPORION

4.3.1 Introduction

Ἐμπόριον/emporion is a very common word in ancient Greek. Indeed, this noun has transparent connotations, as it derives from the verb πορεύω, meaning 'to carry goods', 'to transport merchandise' and ultimately, 'to trade'. However, this term originated in Classical and Hellenistic Greece, and the Roman *emporium* has little to do with its Greek original.

4.3.2 An etymological note:

The etymology of this word is significant and crystal clear in its connotations as a commercial hub. As has been explained above, the word ἐμπόριον/emporion comes from the verb πορεύω/poreuo 'to carry', 'to transport goods' and ultimately, 'to trade'. The lexeme has been nominalised by the attachment of the suffix –ιον, with a meaning related to place (cf. ἐπίνειον/epineion). This has been further modified by prefixation with the preverb ἐν- (naturally with assimilation of the nasal with the bilabial plosive). The prefix ἐν- means 'inside' or 'inwards', much in the manner of *im-port*, so an ἐμπόριον/emporion might be defined as the 'imports-place':

$$ἐν + πορ + ιον → ἐμπόριον$$

Note that the accent is in -πόρ- and not earlier (i.e., not *ἔμποριον) because the accent has already retracted in respect to the verb πορεύω/poreuo.

Casevitz, in Bresson and Rouillard (1993 : 10) proposes that the verb ἐμπορεύομαι/emporeuomai is derived from ἐμπόριον. This is linguistically not plausible (the appearance of the semi-consonant υ would be impossible to explain). Ἐμπορεύομαι/emporeuomai is clearly a derivate from the simple πορεύω/poreuo with the preverb ἐν-. These words relate to those words with the Indo-European root *per-*, as previously asserted by Pokorny (1959 : 816, s.v. *per-*).

It will be worth mentioning here Knorringa's research (1927) on the word ἔμπορος/emporos, where he highlights several times that the original meaning of the term

is that of a traveller. Thus, p. 7: « The word ἔμπορος […] means in Homer "passenger on another's ship"» (see *Odyssey*, 2.319 and 24.300). Most significantly, p. 114: «There where ἔμπορος, in the authors discussed by me, is not used in the sense of "traveller", it always means "travelling trader", so "foreign trader", or "trader to foreign parts". […] The foreign trader naturally conveyed his goods nearly always by sea; this is however something accidental, not inherent in the meaning of the word», and note 4, where he reminds that overland-trade, too, may be indicated by this word. Further discussion on the status of ἔμποροι/emporoi is provided by Reed (2004[2]).

The marginal short-term use of the word in Latin is certainly due to the word *emporium* being borrowed from a foreign language, whereas its progressive abandonment in Greek might perhaps be explained by it designating a reality that no longer existed: the commerce was no longer seen as between different communities. The concept of "foreign" was lost, potentially replaced not by a political "foreign-ness" as much as a geographical one (in line with the idea of "long-distance trade". For comparison, the word ἐμπορία/emporia, deriving from the same root, is used as a generic term for "commerce", although it is true that in later times there arises a need to specify if it is carried out by sea or by land (cf. the *Lexica Juridica Byzantina*, epsilon 47 and iota 81), so even the essential connotation of "sea-borne" is lost at one point. In fact, the word εμπόριο has survived in Modern Greek with the simple meaning of "trade, commerce". To my knowledge, *emporium* has not been preserved in the Romance languages.

4.3.3 Ancient definitions of the ἐμπόριον

Although the *Etymologicum Magnum* is a medieval compilation, it furnishes us with an explanation of the ancient term:

Etymologicum Magnum, Kallierges p. 336 ll. 20 ss.	
Ἔμπορος: Ὁ πραγματευτής· καὶ ὁ τόπος αὐτὸς ἐμπόριον λέγεται, ὁ κατάβολος· ὁ ναύλου πλέων ἐπ' ἀλλοτρίας νεὼς, ἢ πραγματείας· ἤγουν, ὁ διὰ παντὸς τοῦ βίου τὴν πορείαν ποιούμενος.	*Emporos*: the businessman. And that place is called *emporion*, the sea-shore. [An *emporos* is] he who sails for a fare on the ship belonging to someone else, or for business. That is to say, he who does the travelling all his life.

The commercial element in the previous entry is explicit. It is also relevant to note an entry in the *Suda*, which hints at different types of ἐμπόρια/emporia, according to citizenship, although that probably still refers to the Greek concept of ἐμπόριον/emporion:

Suda, *Lexicon*, xi, 32
Ξενικὸν ἐμπόριον· ὅπου οἱ ξένοι ἐμπορεύονται· ὥσπερ ἀστικόν, ὅπου οἱ ἀστοί.	Foreigner's *emporion*: Where the foreigners trade. Like the citizens', where the citizens [trade].

4.3.4 The ἐμπόριον as a Greek term

In the Greek Archaic, Classical and Hellenistic world, an ἐμπόριον/emporion is technically speaking a legal place for *international* sea-borne trade, the place for the activity of ἔμποροι/emporoi, i.e. sea-traders travelling long distances. It originally referred to the port, then by extension to the business carried out in this port. For the Archaic and Classical Greek periods, I have found no evidence of the term ἐμπόριον/emporion applied to inland cities which do not have a port. In this sense, Ardaillon's assumption on the evolution of the word is wrong.[173] When the term is applied to inland cities, these have fluvial ports. There are, though, few examples of the word ἐμπόριον/emporion referring to continental centres in the more ancient literature, such is the case of Naucratis in Herodotus, 2.179.[174] What that text proves through, rather than the emphasis on the commercial centre, is that an ἐμπόριον/emporion was a space with a singular legal status. In any case, it might be more exact to speak of ἐμπόρια/emporia with the original meaning of places of large-scale "ship-borne" commerce, rather than identifying them directly with maritime ports, although the vast majority of these ports were, of course, by the sea. Indeed, transport by ship, either by sea or by river, was more efficient in terms of quantity of product and speed

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[173] According to Ardaillon (1898) p. 59 n. 3, the term ἐμπόριον referred first to a merchant city, secondly to a "maritime station" where trade was carried out, thirdly to the whole port, finally to the whole city. However, according to modern research the term evolved as described above, firstly and mainly referring to a port city where large-scale commerce was performed, and only in later times, to inland redistribution centres. This linguistic process from "sea-centre / water-centre" to "land-centre" is also logical provided that the larger quantities of products were transported by ship.

[174] The fact that ἐμπόρια can be also in river ports is documented elsewhere, e.g. Polybius 34.10.6, Strabo 4.2.3, 3.6.9 and 16.1.9; also in lakes, e.g. Strabo, 15.3.4.

than transport by road.[175] Consequently, the fact that the commerce is waterborne, and therefore long distance, implies that there are members of different political communities performing the transactions. Indeed, the Greek system of πολεῖς independent from one another resulted in the trading operations seen as performed by members of different citizenship affiliations.[176]

Trade by sea is documented since our very first literary evidence (see esp. Hesiod, *Works and Days*, 617-694), and in fact, Aristotle emphasises this function and the role of the state as a controller and regulator of the market (*Politics* 6.1321b). Ἐμπόρια/emporia are usually hailed as generators of wealth. A few examples will suffice to illustrate this point. Strabo, 17.1.13 emphasises the commercial contacts in Alexandria on account of its good ports and the confluence of the Nile and the sea. Strabo, 14.1.24 refers to Delos as once having been the common ἐμπόριον/emporion of all Greece.[177] Pausanias, 8.33.2 depicts the ἐμπόριον/emporion in Ephesus as *the* factor of growth of the city. More generally, Julius Pollux, *Onomasticon*, 8.132 illustrates the wealth generated by taxes.[178]

Corps of police-like officers are also documented for the Greek period inasmuch as the ἐμπόριον/emporion was a space granting legal security in the trade deals. Modern research like that of Bresson and Rendall (2016), which is based on the sources for Classical Athens, assumes that the standard security corps was that of the ἐπιμεληταί/epimeletai of the ἐμπόριον/emporion, i.e. the curators of the market. As so often happens, this body of officers is not usually mentioned explicitly, and when it is, it can appear under different

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[175] For further information on the issues of transport, see de Soto Cañamares (2011). For inland ἐμπόρια related to other water bodies, see for example Strabo, 12.8.15, 15.3.4 and 16.1.9. Cf. also the archaeological remains of the fluvial Emporium of Rome (Keay, 2012, pp. 34-39, with map on p. 35) or the river port of Narona (Mayer, forthcoming). The paper by Vélissaropoulos is an outstanding study on the workers of the ἐμπόριον, and I encourage its reading for the human aspect, which will not be highlighted in this thesis.

[176] For discussion on the *poleis*, see Pomeroy et al. (1999), pp. 84 ss., 349 ss. and 446 ss.

[177] For details on Delos, see Bresson and Rouillard (1993), pp. 113-125 (paper by H. Duchêne: *Delos, réalités portuaires et* emporion).

[178] Blackman (1982b, p. 194) affirms that ἐμπόρια were "duty free zones", which is clearly not the case, since merchandise was indeed taxed in the harbours. See Bresson and Rendall (2016), esp. pp. 102 ss.; Bresson and Rouillard (1993), especially the paper by Étienne (although a larger explanation and the presentation of the relevant sources of evidence would be desireable); Vélissaropoulos (1977). For general discussion on taxes at the Mediterranean harbours, see also Purcell (2005). It is true, however, that in special cases individuals could be awarded the privilege of tax exemption.

regional variations.[179] For example, the inscription *IC*I xxiii 1* [180] offers regulations on the slave trade. It documents explicitly that the security officers in Miletus are the ἐπιμεληταί, whereas in Phaistos, they are called κοσμοί. This proves that an entity supervising and regulating the purchases made in the ports (people, in the case of that inscription, but also goods in general) had a constant presence, although it is certainly incorrect, as some modern researchers do, to use a specific case as support for a general situation. Specifically, the ἐπιμεληταί of the ἐμπόριον/emporion were in charge of policing the area where the transactions took place, help resolve conflicts and possibly also supervise the prices to keep them at reasonable levels (Bresson and Rendall, 2016). [181] There were other specialised groups of officers at the port, most notably the σιτοφύλακες, or corn-inspectors, who where in charge of controlling the quality of the corn imported and registering the imports.[182]

Due to their commercial importance, larger cities founded colonies in strategic places for commercial purposes.[183] For instance, Strabo, 3.4.8, hints at the strategic commercial and economic importance of ἐμπόρια/emporion in relation to the foundation of new towns specifically for this purpose, and in particular Emporion (present-day Empúries, Spain). The text also denotes a certain relationship between the colony and the metropolis: in Emporion they worshiped the goddess Artemis, as did their founders from Massalia (Marseille).[184] In this sense, it is not surprising that later scholars, such as the scholiast to Aeschines, use ἐμπόριον/emporion purely as a synonym of "colony" (scholia in Aeschines, *oration against Ctesiphont*).

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[179] There were no explicit results in a search in *TLG*. Results among the Greek inscriptions in the PHI epigraphic corpus usually mention only the rank of the ἐπιμεληταί in general. See: http://epigraphy.packhum.org/search?patt=%CE%B5%CF%80%CE%B9%CE%BC%CE%B5%CE%BB%CE%B5%CF%84. The modern research assumes by extension the presence of these officers in all ports.

[180] Thanks to the mention of Demetrios in the charge of *stephanophoros*, this inscription can be dated either 260/59 or 232/1 BC.

[181] One would also wish to see much more ancient evidence used by modern scholars to formulate the hypothesis of the functions of the ἐπιμεληταί.

[182] See Bresson and Rendall (2016) pp. 306-338.

[183] The founding of colonies would offer other advantages to the metropolis apart from the purely economic one. For example, it helped ease cases of overpopulation. For Greek colonisations, see: Mossé, 1970.

[184] Cf. Strabo, 4.1.4, where a legend is narrated according to which, the Phoceans who set sail to found a colony in present-day Marseilles, got help and guidance from Artemis of Ephesus, and so they dedicated her a temple in the newly founded town. For a concise summary of the history of Empúries and the remains on site: Arquillué et al. (2007²).

Finally, guilds are also recorded in these ports, but their evidence is mostly epigraphical or in papyri, and as such, outside the scope of this thesis[185]. The extant literary and epigraphic data does prove, though, that ἐμπόρια/emporia were a central meeting point for all the peoples in the same region. In fact, expressions like τὸ κοινὸν ἐμπόριον/emporion ('the common *emporion*'), appear in scholia to ancient literature in order to define such places.[186]

Further consideration on the Greek ἐμπόριον/emporion is not necessary for the purposes of this thesis. For more details, I refer to Bresson and Rouillard, 1993; Bresson and Rendall, 2016; Vélissaropoulos, 1977.[187]

4.3.5 Main characteristics of the Roman ἐμπόριον

4.3.5.1 Emporium as a Latin term and a note on semantic evolution

There is not much to add to what has already been said for the Greek term in Roman age. As a borrowed word, the meaning of *emporium* in Latin was the same as that of the Greek ἐμπόριον/emporion: a limited space within a harbour or near a relevant production centre used for waterborne, wholesale trade. However, for the Romans the space of the *emporium* seems to be much more restricted. For instance, Livy, 41.1.3-5, mentions an *emporium* "inside the port". Later on, the same Livy, 41.27.8, notes the renovation of the very specific site for the *emporium* in the city of Rome. The same is documented in epigraphy. Inscriptions suggest that an *emporium*, at least for Latin speakers, was a restricted, well-defined space. For example, in *CIL* 10 1698 (1) = 1² 3131 (2), Julius Fronto, a curule aedile, boasts that he funded a road into the *emporium* of Puteoli. *CIL* 3 2922, from Iader, is a memorial from Melia Anniana to her husband Quintus Laepicus

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[185] Probably the foundational study on this topic is Waltzing (1895). In the present date, I suggest van Nijf (1997), and Tran (2006; and 2011). More generally, Verboven and Laes (2016). See also Gabrielsen (1994) for the specific case of the Rhodian documents honouring Dionysodorus of Alexandria, and Meijer and van Nijf (1992), pp. 75-76, for P. Mich. V 245, detailing the the statutes of the association of the salt merchants from Tebtynis, an Egyptian village in the present-day Al-Fayum province.

[186] See the scholion to verse 363 of Aristophanes's Frogs, compare also the scholion to Homer's Iliad, 2.570 and Odyssey, 4.355. See also Rouillard, p. 37 in Bresson and Rouillard (1993), on the classification of ἐμπόρια according to the extent of their territory.

[187] For further case-studies, see Lehmann-Hartleben (1923) pp. 28-45. Although the text does not really follow a logical order, and his archaeological research is now outdated.

Bassus stating that she funded an extension of the *emporium*. Finally, *AE* 1934 234 = InscrAqu 1 265 mentioned above records the *emporium* at Aquileia.

In Roman times, the word ἐμπόριον/emporion is borrowed and adapted as *emporium*, but its use becomes greatly marginal. This is due to two reasons: firstly, the literary context itself and secondly, the new political situation. Indeed, the Empire transforms the land into a political continuous unit, as opposed to the grouping of very different city-states. This unity of the Roman Empire favoured the establishment of legal infrastructure in every port, as attested by laws like the *Customs Law of Asia*, and therefore the distinction between the legally restricted space of the *emporium* as opposed to the neighbouring harbours became less prominent. At the same time, when the term *emporium* is employed outside the limits of the Empire, the connotations of exchanges with foreign elements remain, as in Pliny the Elder.[188] Nevertheless, this use may be due to authors not producing data of their own, but relying on previous chronicles. Pliny, for instance, made use of the texts of explorers such as those who accompanied Alexander the Great, and therefore belonged to a different cultural context.

To sum up, in Greek we can reasonably state that the word ἐμπόριον/emporion and those of the same lexical root have in their origin very precise connotations (commerce, long-distance, legality, large quantities, sea-borne, different political communities), which are only adapted to the new circumstances in the transition to the Roman Empire, particularly the Latin speaking part. In this way, one could think that from Strabo onwards (including the Roman authors and more especially Livy), an *emporium* becomes simply a first-rank port of trade or a major commercial hub.

4.3.5.2 Common characteristics with the Greek concept

As I mentioned above, the distinctive feature of the Greek ἐμπόριον/emporion is its commercial function for interstate trade. This is still true for the Roman period, but only to a certain extent. In fact, while the commercial function is still a prevalent indicator of the ἐμπόριον / *emporium*, nothing supports the extrapolation of the Greek features into

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[188] for example, 6.105, where he narrates about the port / *emporium* of Modura.

the Roman period. This also entails that the data published up to date cannot be relied on for this thesis, as publications focus on the Hellenistic age.

The function of ἐμπόρια/emporia as trade centres is still clear in the Roman age. However, the word can be used in two different ways: firstly, merely to designate a harbour for lack of a better expression (see below); but more specifically, to refer to a place of legal commerce outside of the space of the Mediterranean Sea, as in the *Periplus of the Red Sea*. Such a use is documented since Thucydides (e.g. 4.102.3) and Herodotus (e.g. 4.24), both writing in the 5th century BC, and it continued into the Roman period. Indeed, a salient feature of the ἐμπόρια/emporia is precisely this condition of a place of contact and exchange with foreign ethnic groups. This is a motive that repeats itself in Greek literature, but less frequently in Latin (see e.g. Livy, 34.9). This is due to the notion of "foreign-ness": i.e. between different Greek city-states, or between the Roman Empire and the outside (e.g. with the Red Sea).

The focus on trade lingers on from the Greek concept into the Roman one. This is especially well documented at Carthage and Piraeus. The port of Carthage is documented in a description by Appian (*Punic Wars,* 452-455 ed. Gabba-Roos-Viereck)[189] where he reports that, of the two harbour basins, the first part was for merchant vessels and the second half was military. In the case of the Athenian port, a set of boundary stones marks the limits of the commercial space very clearly: *IG* I² 887 A and B, which both read: ἐμπορίο καὶ hοδô hόρος ('boundary of the *emporion* and the road').[190] Opposed to those stones, there is another set of boundary markers, *IG* I² 890 A and B, that reads πορθμείον hόρμο hόρος ('boundary of the ferry anchorage', where the πορθμείον would indicate that it is a port for travelling people: πορθμείον: 'ferry', although they could also convey goods, but only on the "national" scale). These sets of stones thus establish a clear distinction between the mercantile activity and the area for travellers. Finally, There is always a clear distinction between the zone of the ἐμπόριον/emporion and the rest of the πόλις, or between the zone of the ἐμπόριον/emporion and other parts of the port, as we can see in the work of lexicographers such as Julius Pollux (*Onomasticon,* 9.34). In this sense, the ἐμπόριον/emporion being one part of the harbour complex, it is possible to find

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[189] The same passage corresponds to paragraph 96 in the edition of Mendelssohn and the translation by Horace White.

[190] cf. also Demosthenes 35.28 and Xenophon, *Hellenica,* 5.2.16.

places not situated by the sea that are named in this way, such as Dionysius of Halicarnassus, 7.20.2.[191]

In the Roman period, ἐμπόρια/emporia continued to act as a meeting point for peoples outside the organised space of the Empire, and particularly outside of the Mediterranean space, as Strabo 11.2.3 and 3.4.2 attest. Here he documents a number of nomadic tribes all uniting in the same places in order to exchange their goods. However, in order to facilitate the imports and exports from the land to the sea and vice versa, some infrastructures, such as roads, were required. See, for example, Strabo, 3.4.9 for the road system of Iberia leading to Corduba and Gades, "the two greatest of the *emporia*".[192]

4.3.5.3 Wholesale trade and redistribution hubs

Starting possibly during the late Republic, what the word ἐμπόριον/emporion seems to stress is the point of commercial contact between waterborne wholesale merchandise and smaller, local consumption centres. Thus, Narbo is an ἐμπόριον/emporion for Strabo (4.1.12), despite it being situated somewhat inland and only accessible through the étangs and the river Aude.[193] One wonders if Strabo documents the turning point in this respect.[194] Because of the new political organisation, the connotations of the word relating to "international" exchanges are abandoned for the Roman period, as the transactions are no longer seen as foreign. Instead, the linguistic feature "large quantities of products" becomes more prominent, and the fact that the trade is waterborne is maintained. We can see this in several Latin texts as well, such as Livy, 38.30, 39.25, or 38.18. Thus, the word was not forgotten, but its meaning was adapted to the new circumstances.[195]

In this sense, the term ἐμπόριον/emporion is applied frequently to any port involved in wholesale trade that does not fit in the other harbour categories: i.e. it is not an ἐπίνειον/epineion because it does not depend on a major hub further inland; it is not a beach (αἰγιαλός/aigialos) but nor is it a major port complex (λιμήν/limen), or else the

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[191] For further details see the paper by Counillon in Bresson and Rouillard (1993), pp. 47-57, esp. pp. 50-51.

[192] Bear in mind that Strabo never visited the Iberian península himself, so this passage is borrowed from some other autor, possibly Posidonius or Artemidorus, as explained above.

[193] Cf. above the excursus on river ports. For Narbo, see: Grenier (1959), Sánchez-Jézégou (2011) and Sánchez-Jézégou-Pagès (2012).

[194] Some ἐμπόρια in Asia Minor are only known from inscriptions documenting emporiarchs (see 4.6.1 below).

[195] In fact, this is also what Bresson and Rendall (2016) seem to suggest.

author does not wish to be generic in terms of functionality (λιμήν/limen) but the port is not used by the army (ναύσταθμον/naustathmon). Therefore, being a *harbour* that does not fit into any other taxonomy, but which has a certain *commercial* element, as is the case for almost all ports, it seems that the preferred designation for this non-classifiable ports is ἐμπόριον/emporion; the concept of "porto diffuso" in Medieval Venice is similar. An example of this "lack of a better word" could be the *Periplus of the Red Sea*. The compiler of this *Periplus* may not believe that the infrastructure in the ports it described can be considered a λιμήν/limen but also not a simple αἰγιαλός/aigialos. The term ἐμπόριον/emporion also seems to be employed in this way in relation to Genoa (Strabo, **4.6.2**), which receives produce from the neighbouring Ligurian tribes, since the region is ἀλίμενος/alimenos, having only a few shallow ὅρμοι/hormos and ἀγκυροβόλια/ankyrobolia. Since Genoa is neither a λιμήν/limen, nor an ὅρμος/hormos nor an ἀγκυροβόλιον/ankyrobolion, and it has a clearly strong commercial element, it is named in this way.

This last point of the term ἐμπόριον/emporion used for lack of a more specific category is particularly true for ports with a very strong commercial activity in the wholesale trade, and that as such act as major hubs for and to the towns in the surrounding area. For example, the sunken ship Culip IV, found off the coast of Empúries, was travelling with a mixed cargo from Gaul. The cargo of this ship consists of products from Baetica and Italy, but it was travelling from present-day France, probably from Narbo. This shows that there were major ports, such as Narbo in this case, where larger quantities of products would be gathered from many different places. From these centres, smaller-scale traders would buy all the various goods that they believed valuable and re-sell them in the minor ports where they came from, in this case probably Empúries.[196] In consequence, due to its strong function of re-distributing supplies from farther regions to a wider area relatively close by, authors probably felt that Narbo was not necessarily or not just a λιμήν/limen, and referred to it as an ἐμπόριον / *emporium*. The same is true for Arles, which is another possible location for regional redistribution. In this sense, it is interesting to note how Arles forms part of the final destination in one of the segments of the *Itinerarium Maritimum*. Another case of an ἐμπόριον/emporion on a river is that on the Tanaïs documented in Strabo, 11.2.11.

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[196] Nieto, 1997.

In its quality of a major re-distribution centre, the term ἐμπόριον/emporion maintained its expectations of a large number of services from the Greek period into the Roman. As a market-place, an ἐμπόριον/emporion required a number of specialised occupations, practices and architectural elements. Sadly we have little or no indications of those in ancient literature, but we do find data in much later sources, such as the work of Julius Pollux or the *Suda*. We can read the following entries, many of which refer to administrative or juridical practices:[197] Julius Pollux, 7.132, 8.47-48, 8.63, 9.34; *Suda,* delta 300, epsilon 2465, epsilon 2830, ny 86. For a more ancient period, see also Aristotle, *Athenian Constitution*, 51.4; Demosthenes, *Against Lacritus*, 51. Xenophon, *ways and means*, 3.12 details some of the infrastructure necessary for shippers at the port, whereas 3.13, hints at the connections with the local retail market, where tax can be extracted on the imported goods. It will also be illustrative to note the *Customs Law of Asia*, which details the provision for customs offices and guard posts (lines 29-38, esp. 31-33, and 36-38).

Surviving texts can be illustrative of the commercial influence of ἐμπόρια/emporion. For instance, Strabo notes that Lugdunum (Lyon) had the greatest population in Gaul after Narbo, as it was used as an ἐμπόριον/emporion (4.3.2). He also informs us about the exchanges between the local and foreign produce in the ἐμπόριον/emporion of Charax (17.3.20). Thirdly, the commercial element is highlighted in the case of Aegina in that it had to start minting coins and it gave its name to wares, originally local produce (Strabo, 8.6.16). The bay of Puteoli (Pozzuoli) is described as a major re-distribution centre in the literature. Diodorus Siculus, 5.13.2 further adds that the ἐμπόριον/emporion of Puteoli acted as a first workshop for the manufacture or processing of raw materials.[198]

It is also important to comment upon the difference between an ἐμπόριον/emporion and an ἀγορά. I believe it is important to highlight this distinction as I have found that both concepts are often confused in modern research and in translations. As discussed, the ἐμπόριον/emporion refers to a commercial port infrastructure, while the ἀγορά is a market-place inside the city for the everyday needs of the local population. We can see clearly the distinction between ἐμπόρια/emporion and ἀγοραί in Dionysius of

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[197] For a concise summary of the main aspects of the fiscality of Greek cities, see Chankowski (2007). For discussion on the juridical infrastructure, see especially Bresson and Rendall (2016) pp. 306-338.

[198] At present, Meijer and van Nijf, 1992, pp. 93-129, offer a long list of literary passages illustrating what goods were traded.

Halicarnassus, 7.20.2, where he states that envoys were sent to buy large quantities of corn to the ἐμπόρια/emporion, and when they came back, they were received by the people who traded in the ἀγοραί/agorai. In the same way, Plautus, *Amphitruo*, 1009-1014 makes a clear difference between the *emporium* and the *macellum*, that is, between the place for wholesale commerce brought in from afar and the market for everyday necessities. As a general rule, the ἐμπόριον/emporion was the place for wholesale commerce between traders / producers and local sellers, whereas in the ἀγορά the sales were retail, presumably to private individuals. This is very clearly visible in the following papyrus:[199]

P. Oxy. 59 3989 (2nd century AD)	
καλῶς ἐποίησας τὸν οἶνον ἐμπ[ο]ρ[ι]κῶς πωλήσας καὶ μὴ κοτυλίσας.	You made the wine well and sold it wholesale (*emporikos polesas*) and not retail (*kotylisas*).

Another issue would be whether the ports involved in annonarian trade can be considered ἐμπόρια/emporia, because the concepts of the *annona* system and the ἐμπόριον/emporion ports belong to different chronologies. However, I would argue that, at least in the Hellenised East, the concept of ἐμπόριον/emporion did not cease to exist during Roman occupation, the Egyptian ports are a good example of that.[200]

4.3.5.4 *The ἐμπόριον and the civic space: porticoes and the forum*
As a port with a specialised function, namely trade, an ἐμπόριον/emporion needed to have some specific infrastructure. The literary sources, however, do not seem to provide a

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[199] Similarly, Knorringa (1927, pp. 66 ss.) discusses the difference between ἔμποροι and κάπηλοι. He argues from various textual evidence that "wholesale dealer" is not an exact translation for the term ἔμπορος. While it is true that ἔμποροι were likely to trade in much larger quantities than, for example, κάπηλοι, this is due to the fact that they work on long-distance, rather than local, commerce. Thus, Knorringa suggests, the expression "foreign-trader" is more exact a concept than "wholesale dealer", but still the conveying of large quantities of product(s) is obvious. It is also worth mentioning that the term ἔμπορος specialises in some contexts to refer precisely to the merchants who supply the army with victuals (e.g. Xenophon, see Knorringa, 1927 p. 65). Since they were supplying a whole army (or navy), it is evident that they were trading in large amounts of victuals or tools. However, bear in mind that during the Roman Republic, the word ἐμπόριον (and by extension its whole semantic field) changes meaning to relate to the confluence of seaborne commerce into inland centres.

[200] For discussion on the Annona, and particularly the Praefectus Annonae, see: Pavis d'Escurac (1976), Rickman (1980) and Sirks (2010²)

comprehensive catalogue of such infrastructre. Ardaillon (1898 : 59-66), seeks to list the various elements associated with this type of port. The author provides references to texts, but those do not refer to the port as an ἐμπόριον/emporion, but as a λιμήν/limen or a *portus*. Also, his list is misleading in that he mixes Greek terms with Latin ones, even if all the items he lists were present at the ports. Personally, I have found that the literature refers mostly to porticoes (e.g. Diodorus Siculus 20.100.4, Strabo 14.1.37, Pausanias 1.1.3, Thucydides 8.90.3), probably because those were the physical structures in which the deals took place. Vitruvius, 1.7.1, places the *emporium* close to the *forum*. While the *forum* is a complex term itself, it is interesting to note the connection of the port with the political and civic centre of the town.

4.3.5.5 Collection of taxes and money in the ports

The literature from the Roman period depict ἐμπόρια/emporia as hubs of wholesale trade intended for re-distribution. It is therefore reasonable to assume that these hubs were also the place where tax would be collected. However, documents referring to the collection of taxes or the officers performing customs-related tasks are rare in the literature. Material evidence is also scarce, but this is probably due to the fact that structures may not have been fixed, or not situated strictly in the port. In fact, there are good grounds to suppose that the customs posts could be anywhere. At Ostia, one such post has been found inside the city, namely in the *Horrea Epagathiana*.[201] Nevertheless, this *horrea* are located in the commercial part of the city, quite close to the connection with the Tiber, something that may complicate matters: was tax paid upon arrival? Upon departure? Upon the sale of the merchandise? Iconographic and epigraphic evidence seems to show that under the Empire the declaration of the goods took place with the unloading of the cargo, but very little survives in the literary texts in relation to the customs posts.

A very good example of this is the relief of the *Tabularii* now preserved at the Torlonia Museum (number 338 in the museum catalogue). The relief represents two men unloading amphorae from a ship, with three further men behind a table, one of whom seems to be

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[201] The inscription documenting the customs post is *CIL* 14, 4708, which is slightly broken on the right-hand side. Calza (1923, p. 399) expands the inscription as: *Stat(io) Anto(nini) Aug(usti) N(ostri) XXXX G(alliarum) et Hispaniar(um) hic.* For a hypothesis on the nature of the tax, see Calza (1923, pp. 399-402).

writing a register. There is a building resembling a warehouse in the background. It has been suggested that this is a scene depicting the officers of the *portorium*, or customs-office. If this interpretation is correct, it would prove that the customs officers worked from mobile desks and facilities, and performed their activities directly by the side of the ships. Even though it could also be argued that major places would have had the commodity of a permanent office or building, as suggested by the *Customs Law of Asia*, mobile facilities would explain why material evidence on the location of tax officers is largely missing, in spite of a significant number of documents such as ostraka or wax tablets containing their registers.[202] Also, note that the identification of a building specifically as a tax office is extremely difficult purely from the archaeological remains. For example, *AE* 1934 234 = InscrAqu 1 265 records that a certain Eutyches, an imperial officer involved in the collection of tax, funded the enlargement and restoration of both *stationes* at the *emporium* of Aquileia. These *stationes* are probably the buildings where tax money was collected or safeguarded, given Euthyches's job. If such buildings were found in the excavations, it would only be possible to identify their function by the presence of this inscription on site, but generally it is not the case that an explicit indication is preserved identifying the function of the buildings.

Indeed, the *Customs Law of Asia* is an interesting document (Cottier, Crawford and Wörrle, 2008). Throughout this law, three main types of officers in charge of the customs are mentioned: the τελώνης, the δημοσιώνης, and the ἐπίτροπος. The ἐπίτροποι are procurators, officers who undertake the tasks of the first two when they are not available. The difference between the first two charges is not very clear, as both names designate in this case the authority in charge of collecting tax, but in this context it might perhaps be the case that the τελώνης was collecting the tax specifically related to customs (like *portitores* in Latin) and the δημοσιώνης was levying general tax (similar to the Latin *publicani*). It shall be noted, too, that τελώνης occurs in the first part of the law, whereas δημοσιώνης is used in the latter part.[203] The same law states on a couple of occasions (lines 40-42 and 120) that whoever deals with imports or exports in places where there is no customs-office has to continue to the nearest city and register the goods with the highest authority there. Of course, it is to be expected that all major ports had customs officers,

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[202] For a broader discussion on the wax tablets s end the relief, see France and Hesnard (1995).

[203] There are, however, other denominations for officers collecting tax. See, for example, the terms found by Capponi in her Egyptian documentation (Capponi, 2005, pp.126-132).

but it is certainly interesting to note that the law also provides for those cases where the officers might be absent.

Other literary documents on customs, like Alfenus Varus's note on whether slaves need to be taxed in the ports of Sicily (*Digest*, 50.16.203)[204] are not as informative. In recent times, Jones (2006 : 213) suggests that the relationship between merchants and tax collectors worked in both ways when he states that the *publicani* made use of merchants in order to sell the goods that they received as taxes paid in kind, in order to turn that tax into money.

The Athenian law on silver coinage also provides substantial information on the staff involved in monetary and control operations at the port, although it dates back to a much earlier period than this thesis (4th century BC). This law, which is preserved in an almost complete marble stela (Agora Inventory I 7180), is transcribed, translated and discussed by Stroud (1974). It highlights the role of the officer who tested the validity of the coins, as well as other officers connected to him, like the σιτοφύλακες, to whom one had to report offences in the grain market. The place of this public coin-tester was "among the tables" (i.e. the tables of the bankers, where money circulation would be at its highest). Despite the early date of the Athenian document, it is reasonable to accept the presence of officers of this kind in the ἐμπόρια/emporion during the Roman period (at least in the major towns), and particularly in the Greek speaking parts of the Empire and in Egypt, in order to ensure that transactions were carried out with legal, not counterfeit, currency, especially in those cases where foreign currency had to be exchanged.

4.3.6 Further information to be found in ancient literature
4.3.6.1 The missing authority of the emporium
Equally important is the issue of who controlled the ἐμπόρια/emporia, if it was a special authority or else the ports were simply included within the regular authorities of each town. In the literary texts there is no information relating to this topic, a concern shared by

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[204] Book 50 of the *Digest* deals with the meaning of words and expressions. The issue raised by Alfenus Varus is the following: according to the Sicilian Law, you do not need to pay tax on slaves if you are taking them home for personal use, as opposed to selling or exporting them abroad. However, what happens if someone buys slaves in Sicily and "takes them home" to the Italian mainland? Is it still personal use and slaves can go tax-free? Or is it an export, and therefore these slaves must be taxed?

Arnaud (2015a : 62-63): we do not know who the harbour master was. Five inscriptions document the term ἐμποριάρχης/emporiarkhes, or emporiarch, but this data is insufficient in order to generalise. In addition, all of the inscriptions are located in Asia Minor and the Black Sea: IK Side 76 (Side, in Pamphylia), JÖAI 55, 1984, 143-44, 4371 (Ephesos), IK Iznik 1071 (Nikaia in Bithynia, present day Iznik), MAMA VI List 147,117 (Apameia), and GBulg III.2 1690, from Augusta Traiana. Their Eastern location should warn against a generalisation of this data. Incidentally, note also that all these cities lie on rivers, most of them inland, as shown in Figure 21.
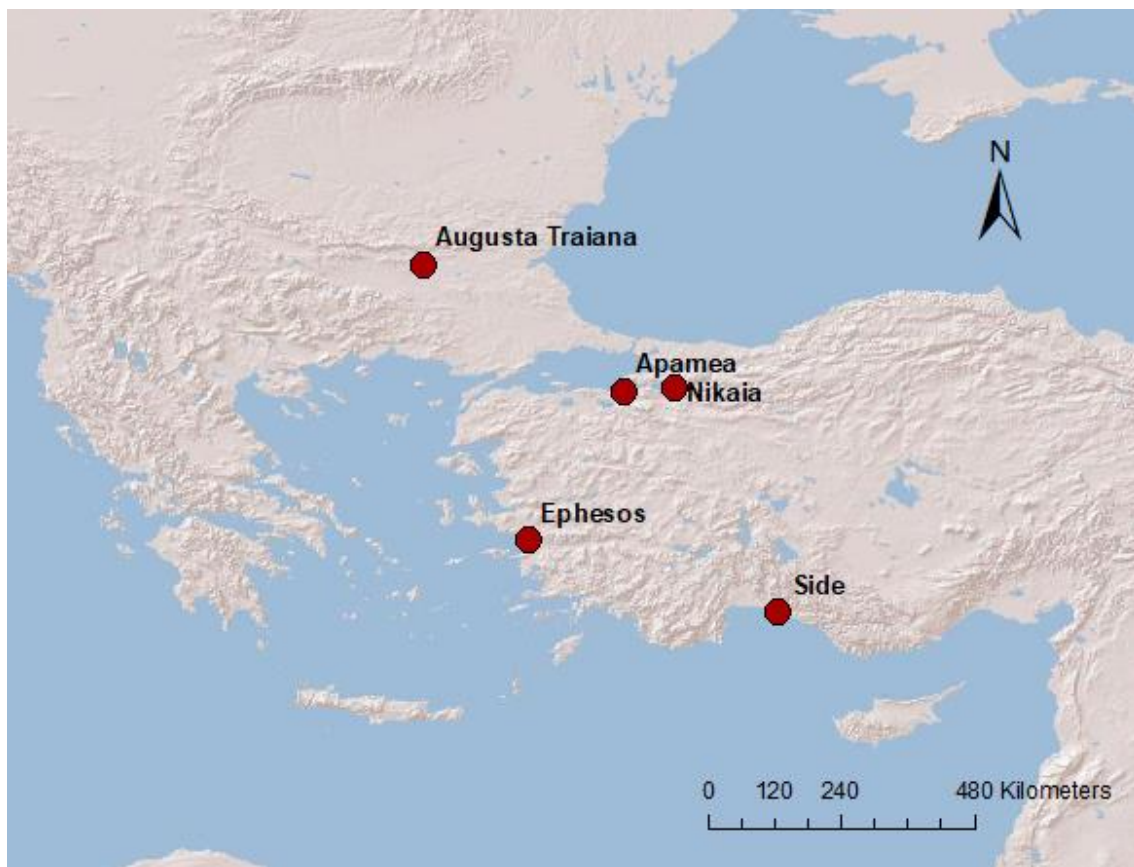
Figure 21. Locations where an emporiarkhes is documented epigraphically

4.3.6.2 Small sales in the ἐμπόριον

It was still possible to buy small quantities of goods in the ἐμπόριον/emporion, particularly in those cases where the merchandise was somewhat special. As we have seen above, the ἐμπόριον/emporion is the place of contact with foreign elements, whereas the ἀγορά is the market-place of the citizens. But citizens may still recur to the ἐμπόριον/emporion when they needed specific wares that they could not find elsewhere, as in the following case:

P. Cair. Zen. 1 59025 (258 – 256 BC)	
Ἀρχέλαος Κρίτωνι χαίρειν. χρέ- αν ἔχομεν κεραιῶν δύο πηχῶν μ ἀνὰ π(ήχεις) κ καὶ σκάφης τρισ- κάλμου. πρὸς Διὸς οὖν καὶ θεῶν μὴ ὀ- κνήσῃς διελθὼν εἰς ἐμπόριον καὶ ἀγορά- σας.	Archelaus greets Criton. We are in need of two beams of forty cubits, twice twenty cubits, [205] and a boat with three tholes. Indeed, by Zeus and the gods, do not hesitate to go to the *emporion* and buy them.

Similarly, although the ἐμπόριον/emporion was always a separated space, and most of the times frequented by foreign traders, we cannot apply as a systematic rule ἐμπόριον/emporion = foreigners, ἀγορά/agora = locals. We have seen the existence of ἐμπόρια/emporia "for the citizens" in the *Suda* passage above (xi, 32).

4.3.6.3 Emporion as a toponym
The function of commercial ports has led to towns being called by the same name as the port, i.e. Ἐμπόριον/Emporion or Ἐμπόρια/Emporia, in a clear case of metonymy (i.e. the name of one part becomes the name for the whole entity). Strabo, 3.4.8 reports the founding of the colony in present-day Empúries (note that this is one of the rare instances where *Emporion* as a toponym has survived). The same place is reported by other authors such as Appian, especially concerning the Punic Wars (e.g. 25 and 161 ed. Gabba-Roos-Viereck; 2.7 and 8.40 ed. White). Some places, however, are documented in literature but they are difficult to locate them on the map. It is the case with a certain Emporion in Syrtis Minor, present-day Libya (Polybius, *Histories*, 3.23.2; Strabo, 17.3.2), and another place of the same name in Italy, near Salapia (Strabo, 6.3.9). Other known places are shown in Figure 22:

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[205] I.e. they need two beams, each of 20 cubits (40 cubits in total between the two). The beams will probably be used to take the sail.
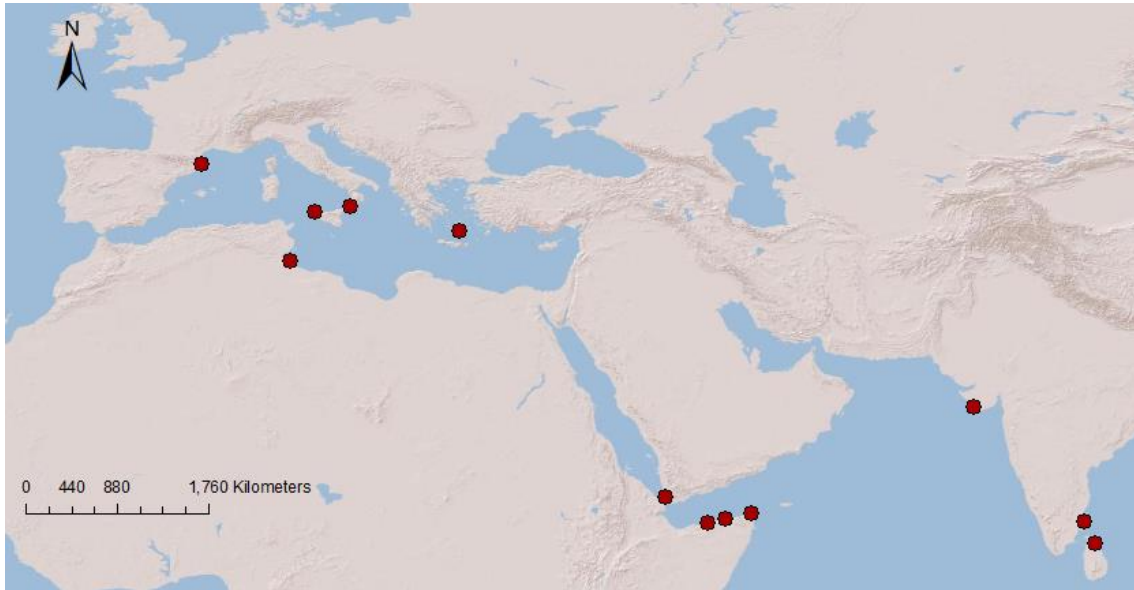
Figure 22. Known placces named Emporion. After the Pelagios Project's Peripleo Map

4.3.6.4 Ἔχρῶντο ἐμπορίῳ

In the linguistic sphere, I would like to highlight an expression that has called my attention. While the verbs are usually conditioned by context, with the copulative being the most used in general, we find some instances of the expression "ἐχρῶντο ἐμπορίῳ" ('they used as *emporion*') in Strabo, 4.3.2, 17.3.20, and 17.1.18. This highlights no doubt the use of the harbour installations that were for large traffic of ships, and for deals *en masse*. Especially in the first passage, it seems as if the speaker has in mind that the harbour is one thing, and the market a different one, and still by saying that the inhabitants of a place "ἐχρῶντο ἐμπορίῳ" a certain port, points at the fact that the commercial infrastructure could be transferred for convenience to the logistical venue, in a similar way perhaps as Rome – Ostia/Portus or Athens – Piraeus. Arguably, the expression that one town "used" another as an ἐμπόριον/emporion might have some political meaning in that the first town would dominate or be responsible for the second. It should also be noted that Strabo 17.3.20 also hints at a black market (λάθρα παρακομιζόντων). In a similar way, Cicero, *Letters to Atticus*, 5.2.2, speaks about the *emporium* "of the inhabitants of Puteoli" (not "in Puteoli"),

4.3.6.5 Temples

Similar to the guild posts, which are documented archaeologically in spaces like the Piazzale delle Corporazioni at Ostia, a research question for the future could be the deep

assessment of the role of temples in *emporia* during the Roman period. In particular, temples are known to have been used as banks, especially for the operations of storing money, but also as places for granting credit or exchanging currency, because they were public neutral zones. Marginally, respect for the gods may also have meant that the trading contracts were somehow protected by common beliefs, but the idea of common space and neutrality played a bigger role than religious scruple, cf. Pausanias, 3.23.3-4, describing the sack of a temple for the valuables stored in it, regardless of its sanctity.[206] Again, temples played an important role during the Greek period with the system of different city-states, with the most paradigmatic case being Delos.[207] But one wonders if temples still played a role during the Roman period, particularly in the smaller harbours servicing a very limited area, and without space for the guilds or corporations.[208]

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[206] Bogaert, 1968.

[207] Particularly, in Delos a large amount of data is preserved about the products traded and their prices. For discussion, Reger (1997). Also, Strabo, 14.5.2, points to Delos as an official market for the slave trade. In this passage, he states that slavery was a very profitable business, so people were easily compelled to capturing slaves and selling them in the nearby market of Delos, where they would soon be bought. This success in the slave trade by the pirates is attributed to the Roman victories over Carthage and Corinth, which encouraged the buying of more slaves. The Cilician pirates noticed this increase in the trade and turned to selling slaves in Delos, an ἐμπόριον which was close to them, according to the same Strabo. It is interesting to note as well how the pirates played an important role on supplying slaves and other commodities (see Gabrielsen, 2001).

[208] For further information on the relationship between the religious and mercantile aspects, see: Gauthier (1972), Purpura (2013), Chankowski (2014), Marotta (1996), and Chapinal Heras (2014) with a case-study on Dodona.

4.4 HORMOS

4.4.1 Introduction

The word ὅρμος/hormos is a homonym that also referred to necklace, or similar-shaped jewel (e.g. a bracelet). This can be observed in several sources, such as Pausanias 9.41.5 and 10.29.7, scholion in Pindar, ode O 2 scholion 135e. An ὅρμος/hormos is, however, also a type of harbour. How the word came to designate an anchorage is unclear. A theory that has long been commonly accepted since Rougé published it (1966 : 113) is that the circular shape of an ὅρμος-collar is metaphorically applied to a round bay. However, as is shown in the discussion below, this theory is contradicted by Finzenhagen's and Chantraine's explanation that the ὅρμος/hormos is simply a place to moor. Ὅρμος/hormos also forms derivates such as ὕφορμος/hyphormos and πρόσορμος/prosormos, discussed below.[209]

4.4.2 Caveat

As shown in the etymology section below, the ὅρμος/hormos is the place where you can moor the ship (ὅρμος: 'ring, set of rings, chain'). In essence, ships would moor by dropping their anchors on the approach to the harbour and, once inside, they would attach their cables to mooring rings to stay put.[210] In this sense, the term ὅρμος/hormos seems to act on two levels. Firstly, to refer to the exact point of contact between the land and the sea, the place for the *mooring ring*. Secondly, by extension, it becomes the whole place where the mooring rings are, i.e. the whole harbour basin. The acception of "mooring-ring place", however, appears more rarely, and especially when authors feel the need to distinguish the ὅρμος/hormos from the λιμήν/limen, and yet not always (sometimes the ὅρμος/hormos is a sub-basin within a λιμήν/limen, see Flavius Josephus below). In the following sections, I shall attempt to investigate if the ὅρμος/hormos as a basin in itself has some special characteristics.

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[209] In some cases, the use of ὅρμος / anchorage is more metaphorical. See, for example, in the *Suda*, alpha 1227: <Ἀλίμενον:> τὴν τέλος οὐκ ἔχουσαν, οὐδὲ ὅρμον; '<*Alimenon*>: which has no end [*telos*] or destination [*hormon*]." In other rare cases, an ὅρμος might refer to the means for anchoring the ship (see LSJ, s.v. ὅρμος, III, and cf. the etymology section below).

[210] For details on anchoring practice, Votruba (2014).

4.4.3 An etymological note:

As noted in the introduction, an ὅρμος/hormos is a homonymic word for either a necklace or an anchorage. Rougé (1966) attaches the name of the jewel to the name of the harbour on the grounds of morphology. However, personally, I am reluctant to accept the shape relation for two reasons. Firstly, because this metaphor is semantically problematic. Apart from the fact that we have no connection between necklaces and harbours in ancient literature (only marginal notes in medieval lexica and scholia), why would the ancient Greek speakers think of a necklace, however rigid, to indicate a rounded bay? Why would they not choose something more obvious, such as a half-moon like in the passage from Longus (2.25.1-2) below, or the horns of some animal?[211] That would also be supported by the existence of the term χηλή, oringally referring to the pincers of a crab, but later it designated a sea basin enclosed by two projecting tongues of land or two artificial moles.[212] Moreover, if an ὅρμος/hormos, whether the necklace or the bay, was intrinsically rounded, why does Longus need to specify the half-moon shape?

Secondly, I cannot find any strong geographical evidence that an ὅρμος/hormos has to be a circular bay as opposed to any other type of port, especially in comparison with λιμήν/limen and in regards to its derivate ὕφορμος/hyphormos, as in the case of Leuke Akte below. The fact that ὅρμος in modern Greek does mean 'bay' as well as 'place to lay at anchor' is rather weak evidence because the former meaning could have simply appeared by metonymy with the latter. Certainly, the preferred site for harbours is in bays or gulfs, rather than on an open shore. But still, this is the case for both ὅρμοι/hormoi *and* λιμένες/limenes. Also, a χηλή/khele consisting of two tongues of land forming a shape like a hoof (hence the name), would also form a more or less circular bay. One could argue that a λιμήν/limen is not necessarily in a bay and that a χηλή might be elongated rather than rounded, but geography still shows that this was not always the case (cf. the ὅρμοι/hormoi in section 5.2). In addition, ὅρμος/hormos is not as widely used a term as is λιμήν/limen, and this causes strong doubts as to whether the definition of ὅρμος/hormos as a '(circular) bay' is unequivocal. If that were the case, why are the

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[211] Cf. Philostratus, *Vitae Sophistarum*, 1.515, where a port is mentioned in Lemnos that is called The Horns. Although the text does not specify, from this toponym it is highly probable that the place called the Horns is a very well enclosed bay between the present locations of Kalliopi and Agios Alexandros, on the eastern coast.
[212] For an illustrative example, cf. Plutarch, *Solon*, 9.3, referring to a place in Salamis on the side facing Euboea, probably the area around present-day Spithari and Ampelakia.

ὅρμοι/hormoi constantly connected with a headland (ἄκρα) and almost never with a bay (κόλπος)? Why aren't Munychia and Zea, for instance, named as such? Why does Misenum on the the bay of Naples only appear as an ὅρμος/hormos once?[213] Why are many of the sites called Panormos in "open", not circular, bays, when they are in bays at all?[214] And we will see the passage about Joppa (Flavius Josephus, *Jewish War*, 3.419-423) below, where the ὅρμος/hormos is by no means protected, but completely exposed to the winds and the swell, the shore is clearly described as completely straight (πᾶν ὀρθίῳ), and the curving of its two sides towards each other as shallow (βραχὺ).

My third reason to doubt that the necklace gave name to the harbour is the high productivity of the term ὅρμος/hormos when it comes to forming verbs, all of which mean "to put in", regardless of the place where this action is performed. Apart from the list below, Finzenhagen (1939 : 144) very correctly states: «It (i.e. ὅρμος/hormos) does not really mean bay, but anchoring-place for the ships, and it is only used in opposed to λιμήν/limen in connection with ships». Finzenhagen does not give further argumentation, but relates ὅρμος/hormos to the verb ὁρμέω/hormeo. It is obvious that ὁρμέω/hormeo is a denominal verb and not the inverse.[215]

Chantraine (1999) attempted to explain why an ὅρμος/hormos could become an anchorage. According to him, an ὅρμος/hormos would be understood as a kind of chain.[216] Thus a necklace if it is in a small format, or, in a bigger format, the chain of the anchor. Then, ὁρμέω/hormeo, ὁρμίζω/hormizo and all other derivate verbs would literally refer to the place to "chain" the ship (i.e., drop the anchor). Ὅρμος/hormos, by

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[213] Lycophron, *Alexandra*, 737. Cf. also the scholion to this verse.

[214] For places called Panormos, see the Barrington Atlas: 47 C2; 49 B3; 51 B4; 55 E4; 57 B2; 58 B1; 60 C2; 61 A3, A4, B4, C2, C4, D3, D-E 4 and E3.

[215] In addition, the verb created from ὅρμος is ὁρμέω 'to lie at anchor', and not ὁρμάω, 'to set in motion', the latter being related to the noun ὁρμή, 'impuls'. Instead, the dictionary of Babiniotis (modern Greek, s.v. ὅρμος) records the possibility of ὅρμος being derived from ὁρμή (< ὁρμάω), but this is implausible due to a considerable psycholinguistic effort as well as a complete shift in meaning: from ὁρμάω 'to set in motion', ὅρμος would be 'the place where the ship is set in motion', although later speakers would have perceived that in those places the typical activity for a ship was 'to lie at anchor' (hence ὁρμέω) and after this change, ὅρμος would become an 'anchorage'. Ὁρμάω is however also documented in connection with ships. The clearest case is found in Julius Pollux (1.123), where he describes the activities that one has to do with a ship, including ἐξορμᾶν τὴν ναῦν ('to send the ship forth'). In more ancient times, Sophocles (Philoctetes, 526-527) also documents the term ὁρμάω when Neoptolemus urges Philoctetes to sail with him: ἀλλ' εἰ δοκεῖ, πλέωμεν, ὁρμάσθω ταχύς· // χἠ ναῦς γὰρ ἄξει κοὐκ ἀπαρνηθήσεται; 'but if you like, let us sail, let us set forth at once: // for the ship will carry [you] and it will not abandon [you]'.

[216] A couple of passages relate ὅρμος with εἱρμός 'sequence'. The passages are namely the scholion in Homer's *Odyssey*, 18.295 and *Etymologicum Gudianum* s. v. ὅρμος. Although the relation might be a late-date folk etymology, it just comes to prove the fact that the primary meaning of ὅρμος is that of a 'ring', or a 'sequence of rings linked together'.

metonymy, would evolve from being the chain of the anchor to the place for it, so the anchoring point. This also explains why the λιμήν/limen is described as the whole harbour complex, while the ὅρμος/hormos is the specific pier. However, this theory has one important flaw, namely that anchors were only rarely attached by means of chains.[217] The issue with the chains is best explained by Frost (1963 : 16 ss.) especially in pp. 16-17, Frost, quoting Commandant Cousteau, demonstrates that the configuration of anchors is such because the ancients did not have chains for attaching them, but ropes.[218] After that, p. 18, she adduces a passage from Caesar (*Gallic War*, 3.13),[219] which indicates that the tribe of the Veneti did use iron chains *in the Atlantic*. But next, p. 19, comparing that with the example of the Nemi ships, probably constructed by Caligula, she concludes that «chains had not become current in the Mediterranean by the first century A. D. At Nemi, a length of rope was found attached to the iron anchor». The same has been corroborated in many other shipwrecks around the Mediterranean. Thus, the etymology of ὅρμος/hormos by comparison with the links of a chain is strongly doubtful from the perspective of the *realia*.

A more convincing theory has been presented recently. Beeks and van Beek (2009, s.v. ὅρμος 2) first suggest an Indo-European root **sor-mo-* meaning 'string', although they note this as doubtful, while emphasising that there is no certain etymology. I completely agree with these researchers when they reject a relationship with ὁρμή/horme 'impulse', while connecting ὅρμος/hormos with the verb εἴρω/heiro 'to string', as well as with the

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[217] Morrison (2001, p.272) after discussing the differences between Atlantic and Mediterranean ships, concludes: «Thus, few, if any, Greek ships featured the oak, the thick beams and iron nails, the leather sails, or the metal anchor chains which were incorporated into the robust ships of the Veneti. Anchors in Greek ships, made of stone in the Homeric period, later of lead, bronze or iron, were instead secured by ropes». In note 15 to this passage, the author explains that chains may have been introduced during the 3rd century BC, although none have so far been reported. Cf. also Campbell (2017).

[218] For photos of anchor remains, see Empereur (1998 : 204, 242, and 244). For the wrecks off the coast of Alexandria, pp. 243 ss.

[219] Caes. *BG*, 3.13.1-6: *Namque ipsorum naves ad hunc modum factae armataeque erant: carinae aliquanto planiores quam nostrarum navium, quo facilius vada ac decessum aestus excipere possent; prorae admodum erectae atque item puppes, ad magnitudinem fluctuum tempestatumque accommodatae; naves totae factae ex robore ad quamvis vim et contumeliam perferendam; transtra ex pedalibus in altitudinem trabibus, confixa clavis ferreis digiti pollicis crassitudine; ancorae pro funibus ferreis catenis revinctae; pelles pro velis alutaeque tenuiter confectae, [hae] sive propter inopiam lini atque eius usus inscientiam, sive eo, quod est magis veri simile, quod tantas tempestates Oceani tantosque impetus ventorum sustineri ac tanta onera navium regi velis non satis commode posse arbitrabantur.* 'For their ships are made and prepared like this: the keels are somewhat flatter than those of our ships, so that they can man them more easily in the ebb and flow of the tide; the prows are raised very high, and so are the sterns, adapted to the greatness of the waves and tempests; the ships are completely made of oak, in order to bear whatever force and violence; the benches for the rowers, which are made of planks a foot in height, are joined by iron nails with the thickness of a thumb; the anchors are attached by iron chains instead of ropes; and for the sails, skins and thin dressed leather, those either because of scarcity of linen and their inexperience of its use, or (which is more plausible) because they considered that sails would not resist easily the great tempests of the Ocean and the great impact of winds and the great burdens of the ships.

identification of the ὅρμος/hormos 'anchorage, point of attachment of the ship' with the ὅρμος/hormos 'necklace' (a necklace, therefore, understood as some kind of cord or cord-like thing tied around the neck). This string / rope / cord hypothesis would also fit well with the ὅρμος/hormos of Olympia discussed below. Since that would have been a fluvial ὅρμος/hormos, it is a priori more feasible that the ships would have been fastened to the pier, rather than that anchors would have been dropped.
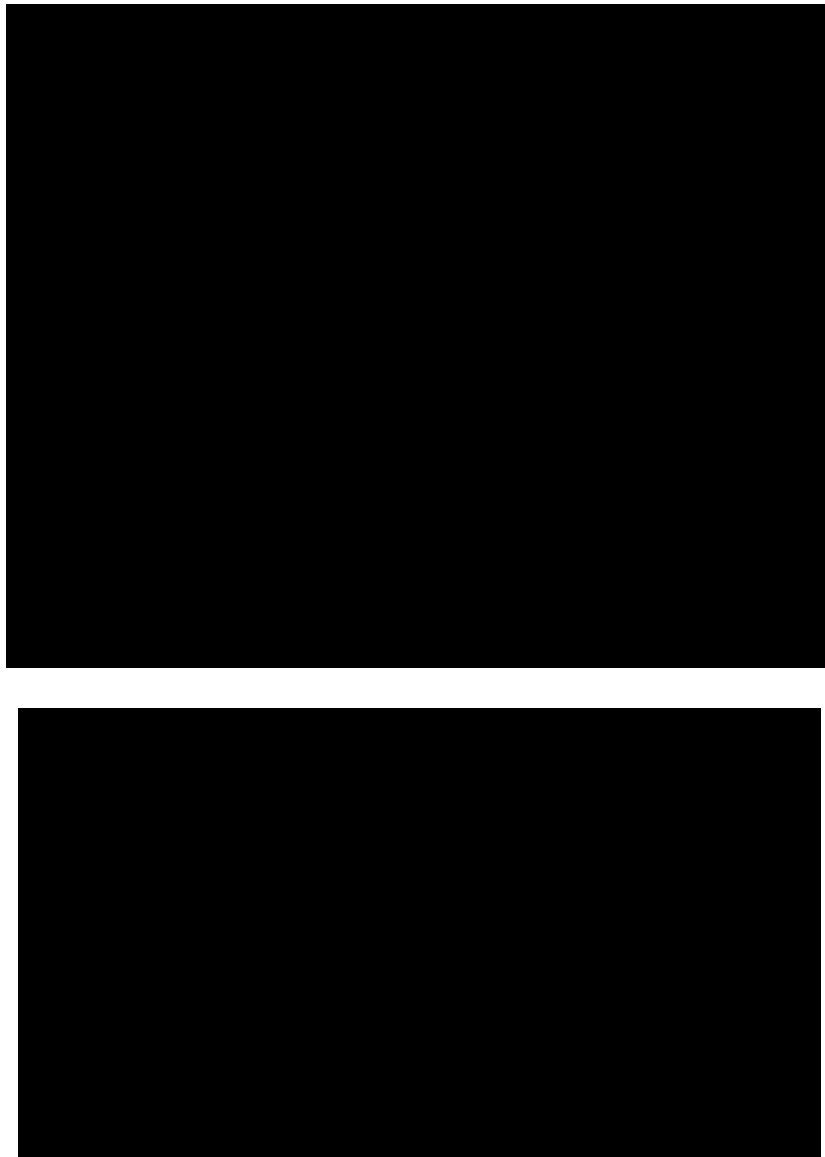
Figure 23. Necklace, full view and detail view, from the so-called Ganymede Jewellery (ca. 330-300 BC) Source: The Metropolitan Museum of Art, http://www.metmuseum.org/toah/works-of-art/37.11.8-.17/, accessed 29th June 2017

Beeks and van Beek also suggest a comparison with ἕρμα/herma in the plural, 'supporting stones', but they note that this is unclear, and I personally must say that I have not found any ἕρμα/herma in the context of the harbourly literature that I am reading. In fact, there have been found in places like Pompeii and Caesarea Maritima some mooring structures

that are solid cubical blocs with round holes inside, where the rope would be tied to attach the ship.[220] That also explains those cases when texts say that the ὅρμος/hormos is only the inner part of the harbour, whereas the λιμήν/limen is the whole. Therefore, probably an ὅρμος/hormos originally designated an anchorage in the sense of a place where one can drop anchor or attach the ships (perhaps in a small location?), rather than a port complex proper.

Further confirmation of this could probably be provided by the examination of the papyrological evidence. That body of material, however, is too numerous and its analysis is too complex to be carried out in the framework of this thesis. The anchoring-point hypothesis seems also reinforced by the existence of an indirect derivate of ὅρμος/hormos, this time a deverbal noun through ὁρμέω/hormeo, the ὁρμητήριον/hormeterion.[221] It usually appears in the plural and seems to indicate specific anchoring points within a larger harbour unit, perhaps to avoid the ambiguity that the ὅρμος/hormos might be both the mooring post or the entire basin. See, for example:

- Plutarch, *Timoleon* 10.8; *Titus Flamininus*, 16.3; *Nicias*, 12.2; *Pompey*, 10.1; *Caesar*, 53.1; *Cato Minor*, 42.1; *Ciciero*, 11.1; *Dion*, 22.8

- Diodorus Siculus, 14.47.4; 16.34.4; 19.72.9; 19.78.2; 20.104.4

- Dionysius of Halicarnassus, 3.38.1; 3.57.2; 6.3.1

- Strabo, 3.3.1; 3.4.6; 5.2.5; 5.4.2; 6.2.3; 6.4.2; 7.1.5; 7.4.7; 7.5.2; 8.5.4; 8.6.11; 9.1.17; 11.2.4; 12.3.41; 12.8.9; 14.3.2; 16.1.11; 16.2.18; 16.2.25; 17.3.13

- Cassius Dio, 36.21.3; 40.38.3, 47.27.1; 71.3.1,2; 74.14.4

- Pausanias, 1.6.6; 1.11.6; 4.5.9; 4.23.7; 4.26.1; 7.7.6; 7.13.6

- Flavius Josephus, *Jewish Antiquities*, 13.215, 16.275, 16.347; *Jewish War*, 1.168, 1.399, 3.141, 3.414, 4.262

- Polybius, 1.17.5, 2.51.6, 2.52.4, 3.15.13, 4.59.5, 4.71.2, 5.3.9, 13.8.2

- Appian, *Iberian Wars*, 75; *Hannibalic War*, 242; *Mithridatic War* 445 and 555; *Civil War*, 3.8.52

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[220] For an image, Blackman (1982).

[221] This noun is built in the same structure as other deverbal nouns. Cf. for example, βουλεύω 'to want, to decide' > βουλευτήριον 'government see, assembly, i.e. place where decisions are made'.

Finally, I would like to add that Christian writers may use the word in a metaphorical sense in order to refer to the salvation offered by Christ. See, for example, Clement of Alexandria, *Exhortation to the Heathen*, 10.107.2.

4.4.4 Ancient definitions of the term ὅρμος

The simplest definition of the term is that found in a scholion to Oppian:

Scholia in Oppian's *halieutica*, Hypothesis-book 2, scholion 684	
ὅρμος· στέφανος, λιμήν, κόσμος, τάξις.	*Hormos*: crown, *limen*, ornament, position.

That scholion defines an ὅρμος/hormos -anchorage as a λιμήν/limen. This is probably due to λιμήν/limen being the core word, or umbrella term, for any kind of harbour. In other words, when providing a definition of a specific term like ὅρμος/hormos, which is ambiguous, the scholiast recurs to the superordinates, as those are easier to separate. A similar example in English would be *glass*: 'material' or 'cup'. The stress on differentiating the harbour from the collar coincides with a scholion to Lucian:

scholion in Lucian. Scholion 80.5	
[ὅρμος] ὁ παραθαλάσσιος [τόπος], ἐν ᾧ καὶ ναυλο[χεῖν ἔξ]εστι, βαρυτόνως, [ὁρμὸς δὲ ὀξυτόνως ὁ γυναι]κεῖος κόσμος.	*Hórmos* is the place by the sea, in which it is possible to lie in the harbour, barytone; but *hormós*, oxytone,[222] is the womanly ornament.

There exist other passages which show the relationship between an ὅρμος/hormos and a λιμήν/limen, most of them stating that the ὅρμοι/hormoi are the spaces for particular ships inside a λιμήν/limen:

Scholion in Lycophron, 737	
ὅρμων Μισηνοῦ· Μισηνὸς δὲ ὅρμος ἤτοι λιμὴν Νεαπολιτῶν. καταχρηστικῶς δὲ ὅρμος λέγεται ὁ λιμήν· λιμὴν γὰρ	Of the *hormoi* of Misenum: Misenum is a *hormos*, or rather a *limen* of the Neapolitans. The *limen* is wrongly called

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[222] A barytone word is the one that has no accent in the last syllable. An oxytone word, that which bears the accent in the final syllable.

| λέγεται τὸ ὅλον πλάτος καὶ ὁ κόλπος, ὅπου καταίρουσιν αἱ ὁλκάδες, ὅρμος δὲ ἡ στάσις μιᾶς ἑκάστης ὁλκάδος. | hormos. For the *limen* refers to the whole extension [of sea] and the bay, where the cargo ships put in, the *hormos* is the space for each of those cargo ships. |

Scholion in Homer's *Iliad*, 1.432	
λιμένος πολυβενθέος: […]. διαφέρει δὲ λιμὴν ὅρμου· λιμὴν μὲν γάρ ἐστι τὸ πᾶν, ὅρμος δὲ τὸ πρὸς τὴν γῆν.	of the very deep *limen*: […]. The *limen* is different from the *hormos*. For the *limen* is the whole, and the *hormos*, the part next to the land.

Scholion in Aelius Aristides, *Panathenaic*, 96.7	
παντοδαποὺς δὲ ὅρμους καὶ λιμένας] τινὲς λέγουσι λιμένας εἶναι ἀχειροποιήτους, ὅρμους δὲ τοὺς ᾠκοδομημένους. […] λιμὴν γὰρ γίνεται ἐν τῷ τέλει τῆς θαλάττης. […] ὅπου γὰρ μόνη θάλασσα, οὐκ ἔστι λιμὴν οὐδὲ ὅρμος. λέγεται γοῦν ὅρμος καὶ ὁ λιμὴν, ὅτι τέθεικε τοῦτο ἐκ παραλλήλου. ἄλλοι δέ φασιν ὅτι ὅρμος μὲν καλεῖται ἔνθα προσοκέλλει τις τὸ πλοῖον, λιμὴν δὲ ἔνθα μετέωρος ἐπὶ τῶν πελαγῶν φέρεται. ὅρμος καὶ λιμὴν διαφέρει. ὅρμος μὲν γὰρ λέγεται ὁ τόπος ἐν ᾧ βάλλουσι τὸ ἄγκιστρον, ὡς ἀσφάλειαν τῆς νηός, λιμὴν δὲ ὁ χῶρος πᾶς ἐν ᾧ ἵστανται τὰ πλοῖα.	All sorts of *hormoi* and *limenes*: some say that the *limenes* are not artificial, but the *hormoi*, built. […] For a *limen* appears at the end of the sea. […] Wherever there is only sea, there is neither *limen* nor *hormos*. Indeed, the *limen* is also called *hormos*, as if they were put in parallel. Others say that the *hormos* is called there where one runs the ship ashore, and the *limen*, there where it is brought to the high seas. The *hormos* is also different from the *limen*. For the *hormos* is called the place where they drop the fish-hooks, so that the ship is secure, but the *limen*, the whole place where the ships stand.

4.4.5 Main characteristics of the ὅρμος

As noted above, the texts show that an ὅρμος/hormos can refer both to a "whole" anchorage location, but also to the specific berthing points. The semantic space of this word, therefore, acts on two levels, depending on the context. Possibly, the term ὅρμος/hormos referred in its origin to a berth, and then by metonymy to the whole complex of berths. This may have occurred through ambiguous passages, like the idiom in Flavius Josephus, *Jewish War*, 2.396. That text records a speech of Agrippa to the Jews, encouraging them not to wage war on the Romans. Agrippa uses the following expression meaning 'to avoid foreseeable problems': *it is good, while the boat is still at* hormos*, to foresee the coming storm and not sail out helplessly into the heart of the thunderstorms.*

In relation to the ὅρμοι/hormoi as "whole" anchorages, many ancient sources coincide in the fact that an ὅρμος/hormos is near an ἄκρα, or sheltered by an ἄκρα. The word ἄκρα is generally understood as a cape, a tongue of land stretching out into the sea.[223] The *Stadiasmus* is the source that best attests this feature, e.g. in passages 18, 34, 81, 95. Fiction texts also attest to this fact, for example Apollonius of Rhodes, *Argonautica*, 2.727-751; [224] Longus, *Daphnis and Chloe*, 2.25.1-2.

However, the fact that an ὅρμος/hormos is related to a specific natural formation (the ἄκρα/akra), does not necessarily entail that it is a natural harbour. Although few, we have instances of some ὅρμοι that are human-made, as we can see in the following texts. For example, *Stadiasmus*, 30 informs us about an ἄκρα which has to its right side a σάλος/salos (i.e., the means for anchoring on the sea, cf. section 4.5) and a lagoon, whereas on the right side, an ὅρμος/hormos was artificially arranged. In addition, Pausanias, 6.19.9 reports about the ὅρμος/hormos of Olympia, which, according to him, was built by Emperor Hadrian. Yet this text is problematic. Firstly, it is unclear at this point as to which port is mentioned here. Olympia does not lie by the sea, so the ὅρμος/hormos may refer to some anchorage point in the river Kladeos, a tributary of the

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[223] Finzenhagen (1939, p. 78) puts the word ἄκρα in relation with the semantic field of the summits and the mountains. This may well be the case when we have a land context, but in the context of the coastline, an ἄκρα refers to a more or less elevated headland projecting into the sea. Further evidence of this is the fact that surveillance structures are set on the ἄκραι, as we can see in *Stadiasmus*, 18 and 34. Cf. also *LSJ* and *Bailly*, s. v. ἄρκα.

[224] Cf. the scholion to this verse: ἠῶθεν δ' ἀνέμοιο <διὰ> κνέ<φας>: νυκτὸς δέ, φησί, τοῦ ἀνέμου λήξαντος, περὶ τὸν ὄρθρον εἰς τὸν περὶ [εἰς] τὴν Ἀχερουσίαν ἄκραν [εἰς] ὅρμον κατήχθησαν; '*having ceased the wind, through the dark*: at night, he says, when the wind had ceased, about daybreak, they put in at the *hormos* in the Acherousian cape.' Cf. also scholion in Xenophon's *Anabasis*, 6.2.2: Ἀχερουσιάδι] ὁ Ἀπολλώνιος ἐν τῷ δευτέρῳ ποιήματι, ἀσπασίως ἄκρας Ἀχερουσίδος ὅρμον ἵκοιτο; '*Akherousiadi*: Apollonius in the second book, he would arrive gladly in the *hormos* in the cape (*akra*) of Akherousia'.

Alpheios, which flows near the complex, or else on a nearby harbour town. However, attempts to trace Hadrian's routes based on the benefactions that he granted to the areas he visited are unsuccessful in this case, as no remains are known specifically for either Olympia or Elis.[225] To make things worse, when the sanctuary of Olympia was first excavated with scientific techniques, it was covered by a layer of sediment 4-6m thick.[226] In other words, while there may have been an artificial anchorage on the river Kladeios, we do not know what form it took – or indeed where it was, for excavations have not found any remains. It is possible that the ὅρμος/hormos was considered artificial because it consisted of some sort of human-made piers for attaching the fluvial boats that transported the pilgrims and the goods to the sanctuary of Olympia, although this is only a hypothesis: as I said, to my knowledge no archaeological remains of this type have been found.

In a couple of cases (*Stadiasmus*, 14 and 57), though, the morphological contour is not an ἄκρα but an ἀκρωτήριον, a summit or promontory. This geological formation would still shelter the harbour from the elements. In fact, one wonders what the difference between the ἄκρα and the ἀκρωτήριον may have been. Perhaps the latter put the emphasis on the height, whereas the former stressed projection into the water?[227]

Another feature of the ὅρμος/hormos is that it is usually in an inhabited place. This, however, does not mean that the human settlement is a large city: in some cases it is only a village. The *Stadiasmus*, for instance, documents a πόλις in 313, 319, 329, 330 and 336, but a κώμη in 78 and 53. Other times we are not informed of settlements, but there are anthropogenic elements in the landscape that suggest the closeness to an inhabited place. We have seen in passage 34 of the *Stadiasmus* above the presence of towers (or perhaps lighthouses?),[228] but the periplus also documents temples (38, 49) or fortresses (63, 78).

The fact that the places are inhabited makes it clear that ὅρμοι/hormoi offered the possibility of obtaining water and victuals. Only in one case in the *Stadiasmus* (passage 81) do we find an ὅρμος/hormos indicated as ἄνυδρος (anydros – 'waterless'). This is

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[225] Cf. Halfmann (1986) and Boatwright (2000).

[226] Ross (1853), p. 3.

[227] Cf. Herodotus, 7.217 ("summit of a mountain"), vs. Plato, *Critias*, 111a (capes jutting out far into the sea).

[228] The word in Greek is πύργος in both cases. Its meaning is 'tower', it only becomes a lighthouse if there was a beacon on top, but this is very difficult to prove archaeologically. It is true, however, that when the *Stadiasmus* indicates purely a look-out post, it uses other terms, e.g. σκόπελος (< σποπέω 'to observe, to examine, to survey'), as in passage 28. Purcell (2005) p. 208 also argues that a πύρος could have been the customs-house, but this is less certain in the context of the *Stadiasmus*, as it seems to note the towers more as visual aids.

highlighted precisely because it was contrary to the norm: the *Stadiasmus* scrupulously documents ὅρμοι/hormoi or the nearby points where there is drinking water (see paragraphs 14, 18, 21, 30, 32, 34, 38, 53, 63, 77, 78, 84, 95, 330, 342). Arrian, too, in the *Anabasis of Alexander* (6.19.3) reports of an island with ὅρμοι/hormoi and drinking water where the king's fleet came during his expedition. In paragraph 336, the *Stadiasmus* documents an ἐμπόριον/emporion within or near the ὅρμος/hormos, where sailors should also be able to obtain victuals and merchandise. Plutarch, *Pompey*, 76.1, too, documents the acquisition of victuals from ὅρμοι/hormoi.

Lastly, ὅρμοι/hormoi are sometimes conditioned by the weather. The *Stadiasmus* frequently reports about θερινοὶ ὅρμοι/therinoi hormoi, that are best used in the summer season (paragraphs 38, 53, 60, 77, 84, 310). The wind is another recurrent element, for example, in the passage of the *Argonautica* above. The *Stadiasmus* sometimes advises about them as well (e.g. 53, 63). Other sources are much less regular, but compare, for example, Flavius Josephus, *Jewish War*, 3.419-423.

Rougé (1966) lists as an anchorage category the phrase ὅρμοι χειροποίητοι (hormoi kheiropoietoi, 'man-made'). A search in the *TLG* corpus, however, rendered only five instances of such an expression, namely:

- *Stadiasmus*, 30: ἐκ δὲ τῶν εὐωνύμων χειροποίητος ὅρμος ἐστίν. "To the left-hand side there is an artificial *hormos*".
- Strabo, 5.4.6: ἡ δὲ πόλις ἐμπόριον γεγένηται μέγιστον, χειροποιήτους ἔχουσα ὅρμους διὰ τὴν εὐφυΐαν τῆς ἄμμου. "this city has become a large *emporion* because it has artificial *hormoi* thanks to the convenient shape of its beach".
- Pausanias, 6.19.9: ὁ δὲ ὅρμος ταῖς ναυσὶ χειροποίητος καὶ Ἁδριανοῦ βασιλέως ἐστὶν ἔργον. "The *hormos* for the ships is artificial and it is the work of Emperor Hadrian".
- Hippolytus, *Chronicon*, 273 (reproducing *Stadiasmus* above).
- *Life of Saint Lucas Stylita*, 41: ὅρμον τινὰ χειροποίητον ἐκ μεγάλων κατεσκευασμένον πετρῶν. "An artificial *hormos* made from a large rock".

These passages[229] prove the fact that ὅρμοι/hormoi can be man-made structures, as opposed to natural shelters. However, given the scarce textual evidence, it is doubtful that a man-made harbour structure would be automatically referred to as an ὅρμος/hormos and not, for example, as a λιμήν/limen. In fact, the need to specify that those ὅρμοι/hormoi were artificial makes one wonder if it was an exceptional trait worthy of highlighting, rather than the norm.

Non-Mediterranean periploi provide a few indications about the safety of ὅρμοι/hormoi by means of the expressions ναυσὶν ἀσφαλής and ναυσὶν οὐκ ἀσφαλής ('safe for ships', 'not safe for ships' respectively). These are in Arrian's *Periplus*, paragraphs 4.4, 14.3 (οὐκ ἀσφαλής); 9.5 (τὸν ὅρμον ἐχρῆν ἀσφαλῆ εἶναι ταῖς ναυσὶ), and 14.4 (ἀσφαλής); and the anonymous *Periplus of the Pontus Euxinus*, 19.7 (οὐκ ἀσφαλής).

The word ὅρμος/hormos has a number of significant derivates. More importantly, it has given place to the verb ὁρμέω/hormeo 'to lie at anchor' (see the etymology section above), but it also generates other nouns by the attachment of prefixes, especially ὕφορμος/hyphormos and πρόσορμος/prosormos. The later has produced the somewhat rare δυσπρόσορμος/dysprosormos, meaning 'a place where it is difficult to anchor', as we can see in *Periplus of the Pontus Euxinus*, 89.

A third derivate of the word ὅρμος/hormos is πάνορμος/panormos, which should probably be understood as a superior form of ὅρμος/hormos, a sort of "full anchorage" or "anchorage for all (ships)". However, it is not a usual word to find as such, but rather it appears as a toponym. Most famously, Panormos is the ancient name of present-day Palermo, but there are other places called by the same name, as shown in Figure 24:

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[229] One more passage could be adduced to those mentioned above: Philostratus, *Lives of the sophists*, 2, Olearius page 606. In this passage, the author reports of a villa by the sea-shore, for which artificial islands (νῆσοι χειροποίητοι) and piers (λιμένων προχώσεις) have been constructed in order to secure a safe anchorage for cargo ships (βεβαιοῦσαι τοὺς ὅρμους καταιρούσαις τε καὶ ἀφιείσαις ὁλκάσιν). However, in this case the language is operating at the lower level, and ὅρμος here refers to berths.
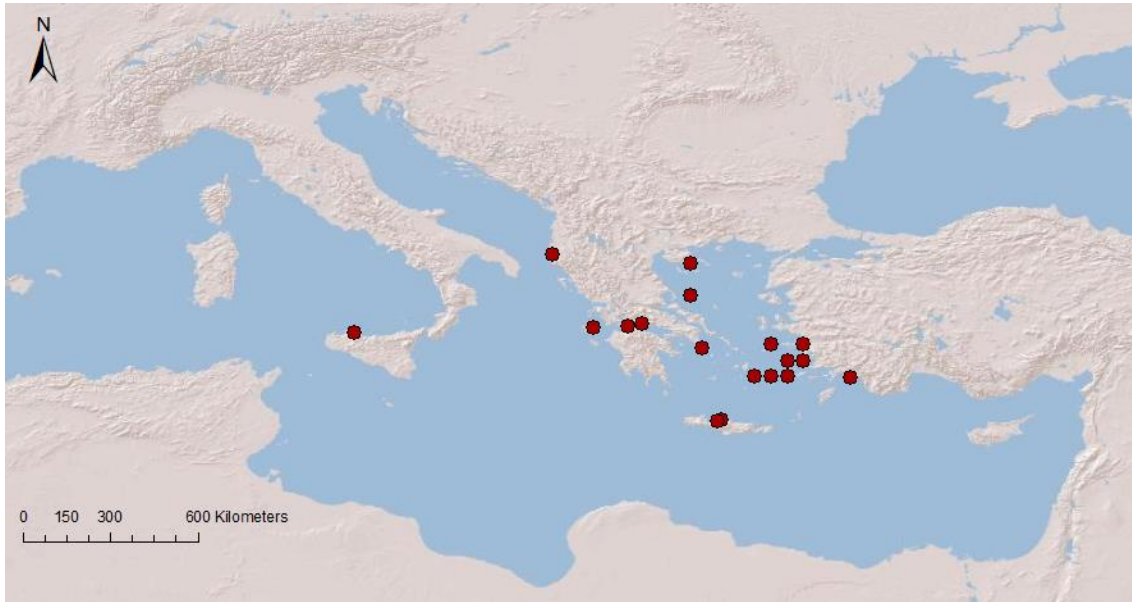
Figure 24. Locations called by the name Panormos. Source: Pelagios, Peripleo

Ὕφορμος/hyphormos and πρόσορμος/prosormos present a significantly high frequency of use, and therefore merit some specific attention. To complicate matters further, sometimes these derivates seem interchangeable for the simple lexeme ὅρμος/hormos. A good example of this are the two descriptions provided by Flavius Josephus on the port of Caesarea Maritima (*Jewish War*, 1.21.5-7 or 1.408 and *Antiquities of the Jews*, 15.9 or 15.332 depending on the editions). Both texts provide exactly the same information, but the *War* reads that there are two sub-basins within the port, naming them as ὅρμους ἑτέρους/hormous heterous, whereas the *Antiquities* uses the expression δευτέρους ὑφόρμους/deuterous hyphormos for the same spaces.

4.4.5.1 ὕφορμος

As noted above, the texts consulted do not show substantial difference between an ὕφορμος/hyphormos and an ὅρμος/hormos. From the purely linguistic point of view, ὕφορμος/hyphormos is composed of the particle ὑπό with the word ὅρμος/hormos, thus being literally a 'sub-anchorage'. This hints at the ὕφορμος/hyphormos being not the preferred form of anchorage, but still an acceptable one. The possible reasons for the ὕφορμος/hyphormos being less advantageous can be multifold: because it has less infrastructure, or because there is a larger unit nearby, or because the coastal morphology

or climatic conditions are less advantageous. Ὕφορμοι/hyphormoi are not exclusive of the Mediterranean, cf. the *Periplus of the Euxine*, 20.

The identifiable places labelled as ὕφορμος/hyphormos that I have been able to find in the written sources are the following: Emporion (in Italy), Chios (Notion and Laious), Ardanis promontory, Greater Syrtis, Lapathos, Palaipaphos, islet opposite Leuke Akte, Icaria island, Laertes fortress, Charadros, Dicaearchia, Strato's Tower (Caesarea Maritima), Cilicia, Kinolis / Antikinolis, Aretias island, Hieron Oros, Tomis, Cape Tiriza, Aualion's Fortress / Theras Place, Derra, Didyma islands, Kalamaios, Artos promontory, Selenis, Chautaion, Ennesyphora, Batrachos, Sidonia island, Zephyrion, Boreion, Apis, Maia island, Hippou Akra, Amaraia, Kargaiai, Cape Ketia, Keryneia, Samonion promontory, Kriou Metopon promontory, Sacred promontory, Storas river, Palinurus, Cape Tamyraca, Pharai, Cape Malea, Patrae, Cape Pharygion, Telos, Bosporus, the coast of the Cercetae, Cyrus River, Tagaiai islands, Heracleia under Latmos, Melas River, Aigaiai, Amanides Pylai, Issos, Cephalai promontory, Cyrene, Aedonia and Plateiai islands, Aphrodisias Island.

On the other hand, the places labelled ὅρμος/hormos that can be identified are the following: Pylos, Lilybaeum, Chytos, Aualites, Ocelis and Muza, Liguria: from Portus Monoecus to Tyrrhenia, Sybari, Myos Hormos, Croton, Cumae, Phalasarna, Petras, Aethiopic region, island on the outlets of the Minho, Monoecus Limen, a place near Pylos and the temple of Samian Poseidon, Kourion, Sybaris, Cyllene, Sardinia, Laodicea, a place near Brundisium, a place near Byzantium, a place near Iolcos, Gades, Laurentum, Tiber area, Memphis, Asia, Argennos, Leuke Akte, Graias Gony, Apis, Eureia, Kardamis, Antipyrgos, Aphrodisias Hormos, Phykous, a place near Berenice, Theotimaion, Chersis, Crocodeilos, Boreion, Cozynthion, Philainon Bomoi, Hermaion, Cape Aineospora, Galabras, Akra, Melabron, Lapathos, Hierapydna, Tarron, Poikilassos, Dictynnaion, Coite, Strato's Tower (Caesarea Maritima), Egypt, Joppa, Mount Dindymon, Chytos Limen, Thynias island, Acherousian headland, Dicte, Crete (?), Cherronesos (in modern Ukraine?), Cape Thunias, Eureia.

Unfortunately, it has not been possible during the course of this thesis to conduct a thorough study of each and every of these sites. What exactly are the defining features of an ὕφορμος/hyphormos in relation to or as opposed to an ὅρμος is difficult to establish. In most cases, however, it seems as that the ὕφορμος/hyphormos was part of a bigger unit or complex, or else an alternative anchorage in comparison with another nearby (e.g.

Stadiasmus, 14 and 303; Strabo, 8.6.1). *Stadiasmus*, 14 is an especially good example. The text states that Leuke Akte, or the White Cape, has an ὅρμος/hormos, but there is also an ὕφορμος/hyphormos. The ὅρμος is for "all" ships. It would be interesting to investigate, however, if the expression παντοίαις ναυσίν/pantoiais nausin has some more precise connotations (e.g. could it refer to military ships?), but in any case, the ὕφορμος/hyphormos is assigned exclusively to cargo ships and it is best suited for westerly winds. A simple look at the map will suffice to show the dichotomy of the two anchorage forms (Figure 25):
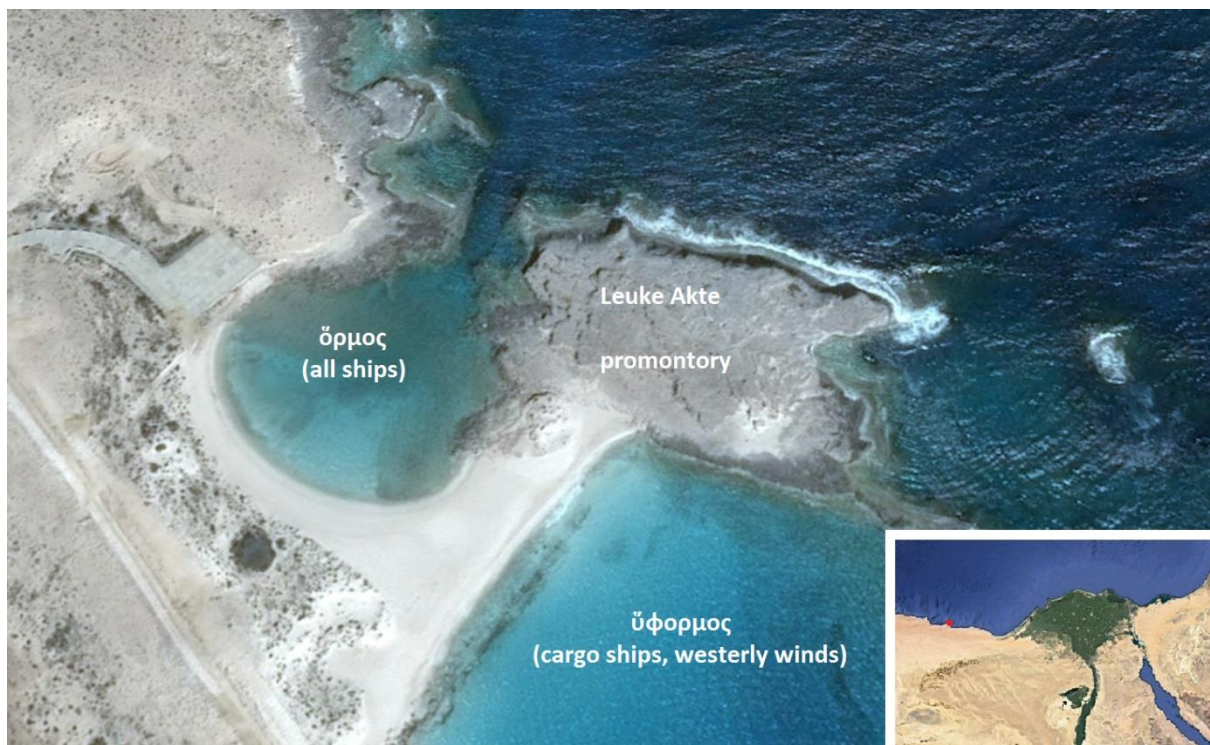

Figure 25. Leuke Akte, with its ὅρμος/hormos and ὕφορμος/hyphormos. Image modified from Google Earth.

The *Stadiasmus* employs several times the collocation ὕφορμος θερινός/hyphormos therinos, i.e. which is good preferably for the summer season (see passages 8, 28, 40, 48; cf. also Strabo, 8.4.5). This might be due to the existence of this double complex, with a preferred anchorage (a λιμήν/limen, an ὅρμος/hormos) and a less good one (the ὕφορμος/hyphormos). In some cases, the ὕφορμος/hyphormos is also associated with elements of the landscape:

ὑφόρμος and other coastal elements

A bar chart titled "ὑφόρμος and other coastal elements" with a y-axis ranging from 0 to 16. Three categories are shown: ἄκρα (14), νῆσος / νησία (13), and κόλπος (2). Legend: number of mentions.
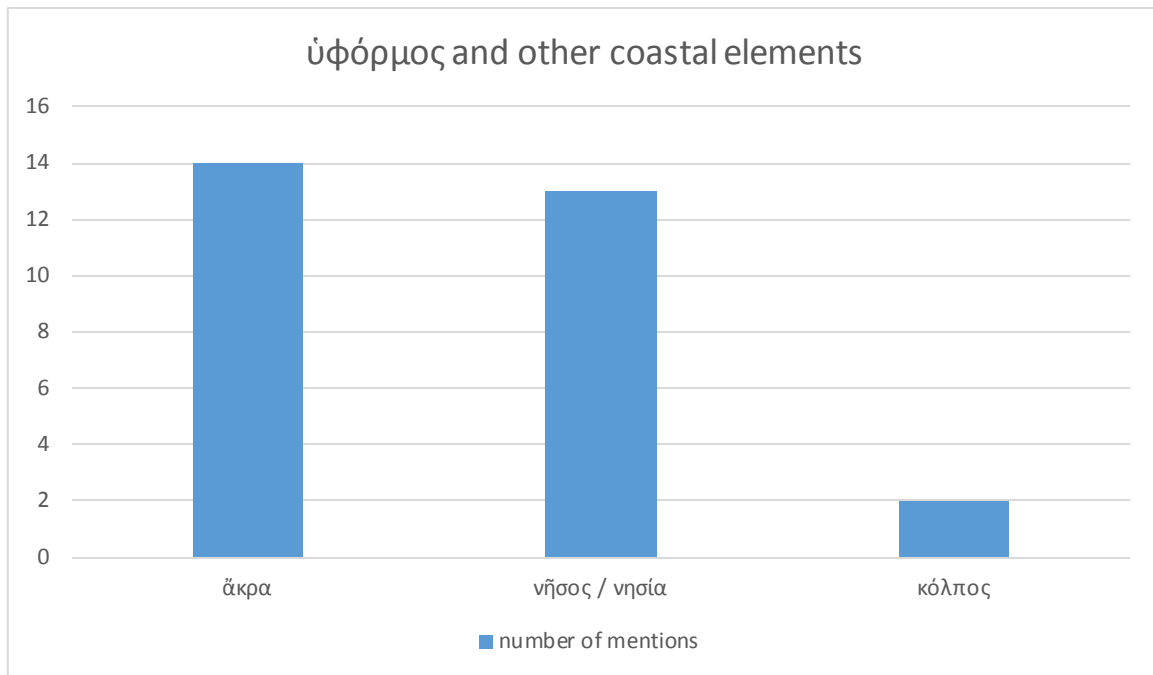
In a couple of cases further geographical information is given about the ὕφορμος/hyphormos. In *Stadiasmus*, 85, we are told that it is located within a rough headland. However, the existence of an ὕφορμος/hyphormos is denied earlier (paragraph 19) within a likewise rough headland. In consequence, the presence of certain coastal morphology does not guarantee the presence of an ὕφορμος//hyphormos, which may have more to do with this relation pointed out above with double harbour complexes.

The *Stadiasmus* sometimes provides information about the depths, but these do not seem to be a significant indicator of what constitutes an ὕφορμος/hyphormos. Paragraph 23 describes it as βραχύς/brakhys, 'shallow', and even advises where to land, whereas in paragraphs 12 and 41 the ὕφορμος is deep enough for cargo ships (φορτηγοῖς/phortegois).

Like the ὅρμος, in most of the cases, the *Stadiasmus* indicates that the ὕφορμοι/hyphormos have drinking water (ὕδωρ/hydor: 8, 12, 28, 40, 41, 75, 85, 96, 318, 334, 350), only one passage presents the ὕφορμος/hyphormos as ἄνυδρος (anydros, 'waterless', 353). As for the human occupation, most of the times we find that ὕφορμοι/hyphormos are not related to a major city, but rather to smaller settlements, or even infrastructure like towers (lighthouses?) or temples (*Stadiasmus*, 17, 96 and 318; Strabo, 14.1.8; Strabo, 14.5.19)

Ship-maintenance infrastructure related to the ὕφορμος/hyphormos is only recorded in one case in the evidence consulted, namely shipsheds (νεώρια/neoria) in Strabo, 14.6.3. Note, though, that this is one of the rare cases where the ὕφορμος/hyphormos is said to be in a πόλις/polis rather than a village (πολίχνιον/polikhnion or κώμη/kome).

The designation of Lapathos \f"author" as a πόλις/polis with νεώρια/neoria would make it a preferable port in all probability, but then it only has an ὕφορμος/hyphormos. The location of this ὕφορμος/hyphormos cannot be identified with certainty, even though the location of Lapathos is known.[230] Consideration for the type of coast around Lapathos adds to the hypothesis that the difference between an ὅρμος/hormos anchorage and an ὕφορμος/hyphormos anchorage lies in the degree of openness, and therefore the shelter, provided by the bay, as in the case of Leuke Akte above. Another possibility is that the intended meaning in Strabo was that besides of a regular port, Lapathos had in addition an ὕφορμος/hyphormos, and that the shipsheds were in the ὕφορμος/hyphormos part, instead of on the main basin, whatever type it was.

The lesser quality of the ὕφορμοι/hyphormoi, and therefore the lesser frequentation by commercial ships, would also explain why in a couple of instances ὕφορμοι/hyphormoi are related to piratical bases, or a kind of black market hidden from the big civilisation hubs where pirates would go to sell the riches they have looted. Strabo, 11.2.12 and 14.1.7 give proof of this issue.

4.4.5.2 πρόσορμος

There is little data on the πρόσορμος/prosormos. The word had been mainly preserved by Strabo, and always with the expression that the town *has* a πρόσορμος/prosormos, usually with the participle form, as in the following chart:

14.1.19	ἄλλο Δράκανον … πρόσορμον ἔχον
14.3.8	μία αὐτῶν καὶ πρόσορμον ἔχει
14.5.3	Ἀρσινόη πρόσορμον ἔχουσα
14.6.3	Ζεφυρία πρόσορμον ἔχουσα
14.6.3	ἄλλη Ἀρσινόη ὁμοίως πρόσορμον ἔχουσα
15.3.11	πρόσορμους οὐκ εἶχεν

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[230] Theodoulou (2007) pp. 198-202.

| 16.2.27 | Στράτωνος πύργος πρόσορμον ἔχων |
| 17.3.22 | τὸ Ζεφύριον πρόσορμον ἔχον |

There is not much we can infer from the previous passages, other than the πρόσορμος/prosormos is seen as the possession of an inhabited place (note the names of settlements). Since Strabo tends to make use of previous sources, one wonders if πρόσορμος/prosormos could constitute a dialectal form for ὕφορμος/hyphormos, or perhaps even for ὅρμος/hormos. Note also that these πρόσορμοι/prosormoi tend to be located in the eastern, rathern than the western, Mediterranean.

4.4.5.3 πάνορμος

As discussed above, Πάνορμος/Panormos seems to be more of a toponym than a harbour category.[231]

In some cases, πάνορμος/panormos is colligated to λιμήν/limen as if it was an adjective, a way to highlight the quality of the port, probably meaning that it is capable of admitting all sorts of ships for anchorage (e.g. Strabo, 14.1.20; Pausanias, 5.7.5; Pausanias, 7.22.10). Note that Pseudo-Scylax, 108, the λιμένες πάνορμοι/limenes panormoi are opposed to the ὕφορμος/hyphormos. The presence of the latter word is explained by the existence of this alternative forms of port.[232] This idea of the πάνορμος/panormos referring to the outstanding quality of the port is also documented in Diodorus Siculus, 22.10.4, but Panormos is a toponym in that case.

As a consequence from the textual evidence above, a πάνορμος/panormos seems to be the most advantageous form of a λιμήν/limen. One wonders, though, why the word is πάν-ορμος and not παν-λίμην (or παλλίμην, with assimilation). The answer might be that the λιμήν/limen originally referred to the space of the sea, whereas the ὅρμος/hormos

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[231] There is even a case in which Panormos is the name of a person. See Pausanias, 4.27.1-2. For further reference on sites called Panormos, see in the Barrington Atlas: 47 C2; 49 B3; 51 B4; 55 E4; 57 B2; 58 B1; 60 C2; 61 A3, A4, B4, C2, C4, D3, D-E 4 and E3.

[232] This is the only passage that I am aware of in which πάνορμος does not seem to act as the name of a place. However, the textual tradition of Scylax itself makes this passage slightly doubtful. Pascal Arnaud, in a personal communication, described the issues in the following way: «This passage is highly suspect: the mention makes little sense in its context and contradicts part of the information previously given. The fact that the text has come to us from a codex unicus makes it possible that the word may well be an interpolation, or a misunderstanding, or an eulogy of Cyrene. In the following area (between Cyrene and the altars of the Philenes), Strabo has a similar synthetic approach of ports he does not name. With the exception of Apollonia, port of Cyrene, and of the lagoon of Berenike, there was no good shelter in this whole area».

specifically designates the action of mooring (see the etymology section below and in 4.1). For example, the *Stadiasmus* has 11 instances of the word πάνορμος/panormos,[233] always as a toponym. But note the way that the *Stadiasmus* indicates the capacity of the ports. In passage 14 the *Stadiasmus* indicates that there is an ὅρμος μακρὸς παντοίαις ναυσίν/hormos makros pantoiais nausin ('a large *hormos* for all ships') in Leuke Akte. The word πάνορμος/panormos may well have originated from this idea of an ὅρμος παντοίαις (ναυσίν). It will also be interesting to note the difference in the Greek language between whether a port is for φορτηγοί / ὁλκάδες ('cargo ships, transports') and the νῆες μακραί ('long ships', i.e. warships).

Pascal Arnaud (personal communication) is of the opinion that the inner part of the harbour, which was more sheltered and easier to control, may have been specially reserved for long ships (i.e., warships), whereas the outer part may have been used for round ships (i.e. transports and merchant ships). While more tangible evidence may be missing, I believe Arnaud's suggestion is consistent from the linguistic point of view, as that would explain the existence of a word referring exclusively to the military premises within the harbour, the ναύσταθμον/naustathmon (see 4.6). It would also explain the existence of inferior harbour forms, such as the previously mentioned ὕφορμος/hyphormos or the σάλος/salos (see 4.5), in those cases where the harbour premises are not good enough to accommodate a certain kind of ships. Thus, the πάνορμος/panormos would be the most perfect form of port, as it would indeed have enough space, depth and shelter for all kinds of ships. That might also explain why Ephesus has a basin called πάνορμος/panormos, for it would be more accessible or somehow with better facilities for most ships than the other basin, at least before the sedimentation issues.[234]

4.4.6 Further information to be found in ancient literature:

I would like to point out two unusual cases. Firstly, *Stadiasmus*, 312, records the ὕφορμος/hyphormos as the only form of anchorage on that area (Ceryneia). If the ὕφορμος/hyphormos exists in relation to another anchorage form, is the *Stadiasmus* perhaps taking a more established port for granted, in that it refers to Ceryneia as a city? Or else could this periplus simply be using the words ὅρμος/hormos and ὕφορμος/hyphormos synonymously? It should be remembered that the textual tradition

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[233] Paragraphs 31, 32, 262, 263, 282 (twice), 285, 287, 292, 293 and 294.
[234] For the harbours of Ephesus, see Steskal (2014).

of the *Stadiasmus* is anything but self-evident and that this text was composed any time ranging between the 6ᵗʰ and the 2ⁿᵈ or 1ˢᵗ centuries BC.

Secondly, Appian, *Mithridatic Wars*, 420 seems to suggest that the ὕφορμος/hyphormos is the preferred form of port. The issue is that the other form of anchorage referred to are ναυλοχίας. This latter lexeme only produces 10 matches in the *TLG*, 4 of which in Appian, 1 in Plutarch and the rest in Byzantine authors. This seems to be a derivate of the verb ναυλοχέω 'to lie at anchor, esp. in wait to sally out', which is documented since Herodotus. However, both Appian and Plutarch belong to the 2ⁿᵈ century AD, therefore these ναυλοχίαι, have to be treated as a neologism, at least in the grammatical form of a noun. Yet it is interesting to see how in the *Lexica Segueriana, Glossae rhetoricae*, ny, 282, 25, the ναυλοχίαι act as a replacement for the ὅρμος/hormos 'berth' in order to solve the problem of ambiguity with the ὅρμος/hormos 'basin'. In this sense, it could well be that in Appian's text the ὕφορμος/hyphormos refers to the whole anchoring installations, whereas the ναυλοχίαι/naulokhiai would mean more specific berthing locations.

On the lexical sphere, compared to other harbour forms, like the λιμήν/limen or the ἐμπόριον/emporion, we can see that the information provided by the textual sources on the mention of the term ὅρμος/hormos as a form of anchorage is not abundant. However, a search in *TLG* confirms that this lexical root is highly productive in order to generate verbs meaning "to moor", something that advocates strongly for the ὅρμος/hormos as a very specific point to attach the ship, probably with a cable, rather than riding at anchor with the ship. These verbs include the basic root, with a verbal suffix, and in the majority of cases, a preverb adding a speciality in meaning, such as:

- ὁρμίζω 'to moor'
- προσορμίζω 'to moor at a specific point'
- ἐνορμίζω 'to bring a ship to land, to enter the port or anchorage'
- καθορμίζω 'to put in, to drop anchor'
- μεθορμίζω 'to go and moor somewhere else, change anchorage'
- ἀνορμίζω 'to take the ships from their moorings and put to sea'
- εἰσορμίζω 'to bring into the anchorage'

It must be noted that verbs for "anchoring" are not formed with any of the other lexical roots investigated in this thesis. Bear in mind that the only other similar verb formed upon another lexeme, ἐλλιμενίζω/ellimenizo (< λιμήν), has no relationship to the fact of

anchoring, but refers instead to the exaction of harbour dues for rights of anchorage. This collection of verbs above strongly advocates for the definition of an ὅρμος/hormos not as a port, but as a point for anchoring (cf. the etymology above). Another illustrative example of this is phrase ποῖεσθαι τὸν ὅρμον (literally: "to make the anchoring") in Philostratus, *Life of Apollonius of Tyana*, 4.13.

4.5 SALOS

4.5.1 Introduction

A σάλος/salos is not a major harbour form. However, we have notices of σάλοι/saloi in harbour contexts, and Rougé lists it among his categories. Therefore, the word has been included in this thesis. Its search was not easy, however, as its basic meaning is 'agitation', and especially of liquids. Galen, for example, employs this word when he refers to the blood's pulse.[235]

4.5.2 An etymological note:

As hinted by some etymological compilations, σάλος/salos is derived from the same word as ἅλς/hals ('salt, salt water, the sea').[236] This word is therefore derived from the Indo-European root *sal-. The term would have first designated salt water, i.e. the sea. Hence it specialised in meaning the rough seas, the agitated waters during a storm. From this idea of agitated waters into "any tossing or revolving motion", and thus σάλος/salos can be applied to the pulse of the blood and even, metaphorically at first, to riots of men and the σάλος-less λιμήν/salos-less limen which is Christ.[237]

Beeks and van Beek (2009) suggest that σάλος/salos comes from θάλασσα/thalassa ('the sea') in an undocumented form *σάλασσα or from ζάλη/zale 'storm' or ζάλος/zalos 'mud'. I consider their options improbable.

4.5.3 Ancient definitions of the term σάλος

As Rougé states (1966 : 110), the σάλος/salos is mainly known through the peripli, and it is difficult to give a detailed definition of it. This sentence highlights the scarcity of information in ancient sources. The closest thing we have to a definition is part of an entry in the *Suda*:

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[235] E.g. *De causis pulsum*, Kühn vol. 9 p. 174: παραμένει γὰρ ὁ προειρημένος σάλος ἐν τῇ κινήσει τῶν ἀρτηριῶν. Also *De crisibus*, Kühn vol. 9 p. 596: τὸν ἐν τῷ αἵματι σάλον.
[236] See, for example, *Etymologicum Magnum* s.v. σαλεύω and *Etymologicum Gudianum* s.v. σάλος.
[237] Epiphanius, *Ancoratus*, Pr. 2.3.

Suda, alpha 3514	
Ἀποσαλεύσας: παρὰ Θουκυδίδῃ ἀντὶ τοῦ ἀποφυγὼν ἐκ τοῦ λιμένος καὶ σάλῳ ὁμιλήσας, τουτέστι τῷ ἀλιμένῳ τόπῳ, ἔνθα σάλος γίνεται.	*Aposaleusas*: in Thucydides, [this is said] instead of he who flees from the *limen* and encounters a *salos*, that is, the *alimenos* place, in there it becomes a *salos*.

Apparently, a σάλος/salos is an ἀλίμενος/alimenos place, i.e. a place without a λιμήν/limen, without shelter.

4.5.4 Main characteristics of the σάλος

The sources coincide in the ἀλίμενος/alimenos feature of the σάλος/salos. However, there is not much further information to be found in the textual sources. What we can read in the ancient literature is that the σάλος/salos is related to extreme weather events, such as violent waves. We find expressions like ἐν σάλῳ μεγάλῳ καὶ κύματι τυφλῷ (Plutarch, *Lucullus*, 13.3); τοῦ πολλοῦ σάλου τῶν κυμάτων (*Scholia in Oppianum*, 3.474); τὸν σάλον τῶν κυμάτων (*Septuaginta*, psalm 88.10); σάλου καὶ κλύδωνος (Plutarch, *Camillus*, 3.3). This has led to σάλος/salos sometimes meaning simply 'bad weather on the seas', such as in Lucian, *Toxaris*, 19.

Like the entry in the *Suda*, a number of sources insist on saying that the σάλος/salos is ἀλίμενος/alimenos, most notably the *Stadiasmus*, 3, 99, 126 (λιμένα οὐκ ἔχει).[238] The word σάλος/salos, though, seems to denote primarily the rough seas or the movement of the waves. Examples of that are Diodorus Siculus, 14.68.5, *Scholia in Lycophronem*, scholion 100.

Three significant passages put the σάλος/salos in relation to other water bodies. *Stadiasmus*, 9, conjoins the σάλος/salos to a λιμήν/limen, but it must be taken with caution, as the fragment might be corrupt.[239] If the fragment were correct, however, it would be the only instance of a σάλος/salos in a λιμήν/limen, whereas the other sources put this term in connection with the contrary of a λιμήν/limen, i.e. with the adjective ἀλίμενος/alimenos, as I explained above. If the σάλος/salos was an anchorage on open

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[238] Possibly also *Stadiasmus*, 7, if it were to have a structure similar to ibídem, 3.

[239] This passage might be corrupted. Arnaud (personal comment) notes that σάλον (accusative) is the text proposed by Müller (1855), whereas the manuscript seems to read *σάλος* in the nominative.

waters, as hinted by its other meaning of "agitation in the seas", it could be possible that the λιμήν/limen is the more established port and that ships also have the possibility of anchoring offshore if the are too large for the harbour, or if the harbour is of small capacity and too busy, or simply if they want to avoid anchorage tax.

The second passage, *Stadiasmus,* 30, is more significant. The text notes that the sailor shall see a σάλος/salos and a λίμνη/limne, with an artificial ὅρμος/hormos on the left hand side. What this indicates is that a σάλος/salos is not an enclosed space, like the λίμνη (lagoon), and also not an artificial place, such as the χειροποίητος ὅρμος/kheiropoietos hormos. Moreover, the fact that the text needs to specify that the χειροποίητος ὅρμος/kheiropoietos hormos is on the left hand side of the lagoon and the σάλος/salos clearly distinguishes the latter as a specific entity. From the previous sources that use the concept σάλος/salos as a term for agitated seas, and taking into account its independence from the ὅρμος/hormos in the passage we have seen, one might consider that the σάλος/salos is an anchorage outside of the harbour.[240] What one wonders, though, is what characteristics the σάλος/salos has so that one can "see" it, as the *Stadiasmus* states. Polybius, 1.53.10 poses a similar problem when he highlights again the lack of a λιμήν/limen, but the existence of σάλοι/saloi where the Romans could moor their ships. Polyaenus, *Stratagemata,* 3.4.3, is even more clear in indicating the σάλος/salos as an open-water anchorage when he writes that the Paralus, the messenger trireme of the Athenian navy, sailed straight to the σάλος/salos and around a cargo ship that lay at anchor there. Therefore, the σάλος/salos would still be sufficiently away from the harbour so that the Paralus can sail round it and use it as a kind of shield. Thus, again, the σάλος/salos is an anchorage on the sea, possibly where there is no λιμήν/limen (note that the text states that Phormio was sailing περὶ Ναύπακτον, 'in the area of Naupactus', but not *in* Naupactus). Ps.-Arrian, *Periplus of the Red Sea,* 55 provides even further evidence about a σάλος/salos being the anchorage in the high seas, because it states that the coast is not deep enough for the merchant ships, therefore they have to ride at anchor in the σάλος/salos and tranship their merchandise with lighters to and from the land. Indeed, even today ships still sometimes anchor on the high seas in front of, rather than in, the harbour for various reasons: tax, quarantine or even bad weather among others. Both Polyaenus and Ps.-Arrian quoted above make use of the same expression. Both texts, when referring to the ship that lay at anchor on the σάλος/salos, they read ἐπὶ σάλου/epi salou.

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[240] For a hypothesis on this subject, see below the section on the word ἀγκυροβόλιον/ankyrobolion.

Nevertheless, after a search in the *TLG*, this is the only evidence that I have been able to find with this expression. Thus, with such scarce evidence, it is dubious whether the texts use the same two words by coincidence or it is in fact a collocation.

Latin literature also provides this sort of association, as the term σάλος/salos was borrowed in the form *salum*. For example, Ps.-Caesar, *Bellum Africum*, 62-63, states that some ships had to spend the night in the *salum* due to bad weather conditions. Similarly, Livy, 25.25 documents how Bomilcar was able to make a sally because due to a storm the Roman ships had not been able to stand guard at the *salum* in front of his port.

The practice of dropping anchor on the seas pre-dates even the period discussed in this thesis. Indeed, as Frost demonstrates (1972 : 97-98), since pre-Roman times ships could anchor in open water, especially on reefs, in order to transfer their cargo onto lighters or to wait for better weather conditions. Archaeology also provides examples of this, such as the wrecks of Heracleion-Thonis. Robinson and Williams (2001 : 25) state: «Through a consideration of the location of the shipwrecks in relation to the known topography of the harbour, it can be suggested that certain shipwrecks seem to have been anchored in the harbour itself, with some being tied up to posts, while others seem to have been moored to drag anchors outside of the main harbour».

Still, the fact that ships anchor in the σάλος/salos, i.e. outside of the harbour, does not mean that the place is deserted. The periploi, for instance, do list towns when they refer to σάλοι/saloi. However, the fact that there are cities (and therefore, inhabited areas) does not prevent the dangers of anchoring in the high seas. Because of this reason, some passages advise to take care in the σάλος/salos, like *Stadiasmus*, 55, 99 and 126.

The likelihood that the σάλος/salos is an anchorage in the open seas is further supported by the verb σαλεύειν/saleuein. In its first acception, the verb means "to shake, to cause to move", but when applied to the context of ships, it refers precisely to riding at anchor in the sea. This we can see in passages such as Flavius Josephus, *The Jewish War*, 1.409. Note that Josephus highlights "σαλεύειν ἐν πελάγει" ('ride at anchor out to sea') for further emphasis, as there are no suitable harbours. In the case of Rome, Dionysius of Halicarnassus, 3.44.3 informs us that ships that are too large to sail the up Tiber must drop anchor at the sea in front of the river's mouth. Another clear instance of this appears in Diodorus Siculus, when he documents the features of the coast around Casium (probably at the western end of the Sirbonian Lake, in Egypt). Diodorus clearly states that the sailors

could not reach the land, so they had to drop anchor in the sea (ἀποσαλεύειν) a couple of stadia away from the actual shore. Plutarch, *Sertorius*, 7.6-7[241] is also significant. The author is reporting about the naval efforts of Sertorius. The general first tries to find refuge in New Carthage, then sails to Africa, then back to Spain, where Annius joins him with some more ships to initiate an attack on the coast. However, when a strong wind starts to blow, they find themselves floating neither inside nor outside the harbour premises, i.e. σαλεύειν/saleuein, something that is clarified in the words that they were banned from the open seas (it was too dangerous because of the storm) but that they could not land either because of the enemies. Finally, the *Periplus of the Pontus Euxinus*, 19 documents a place where the ὅρμος/hormos is not good, and recommends anchoring on the high seas as long as there are no storms (i.e. σαλεύειν/saleuein as opposed to entering the unsafe ὅρμος/hormos).[242] Therefore, the existence of this derivate, σαλεύειν/saleuein, adds further prove that a σάλος/salos is the offshore anchoring.

The verb σαλεύειν/saleuein, however, has connotations of peril. We do not find those so often in the periploi for the noun σάλος/salos, but they do appear in the more descriptive literature, such as Strabo, 5.3.5, who points out that the ships ride at anchor with peril (παρακινδύνως).

It is also interesting to note that the verbs σαλεύω/saleuo and ἀποσαλεύω/aposaleuo developed from the image of a ship floating on water in order to fit other contexts, and not the other way round. We can be sure of this evolutionary direction because these are denominal verbs, i.e. derived from the noun σάλος/salos (see etymology section above). Thus these verbs originally indicate the movement of the ship that is floating on the sea without advancing, i.e. the ship that is being tossed about or swung by the waves. Hence the verb acquired the meaning of 'to shake', and can be applied in new situations, for

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[241] ed. Ziegler, corresponding to 7.4 ed. Perrin.

[242] Anchoring in the open seas due to the lack of an ὅρμος is also documented elsewhere, sometimes with verbs other than σαλεύειν/saleuein, for example in the *Suda*, sigma 502: Σῖτος: πᾶς ὁ σιτικὸς καρπός, οὐχ ὁ πυρὸς μόνον· καὶ αὐτὰ τὰ σιτία. Θουκυδίδης δ': καὶ τῶν νεῶν οὐκ ἐχουσῶν ὅρμον, αἱ μὲν σῖτον ἐν τῇ γῇ ἡροῦντο, αἱ δὲ μετέωροι ὥρμων· 'Cereal: the whole ceral production, not just the wheat: and also the actual provisions. Thucydides: "and as the ships did not have a *hormos*, some brought the cereal to land, others anchored on the high seas (*meteōroi hōrmōn*)".'

example that of an earthquake[243] or the beating of city walls to destroy them during war operations.[244]

4.5.5 Further information to be found in ancient literature:

Stadiasmus 72 is a complex passage:

Stadiasmus, 72	
Ἀπὸ τοῦ Εὐσχοίνου ἐπὶ τοὺς Ὑφάλους στάδιοι ο΄· νησίον ἐστὶν ὑπόσαλον· ἔχει δὲ καὶ αἰγιαλὸν βαθύν.	From Euschoenus to Hyphali, 70 stades. There is a *hyposalos* islet. But it also has a deep *aigialos*.

Ὑπόσαλον/hyposalon is, of course, an adjective in correspondence with νησίον. In a search within the *TLG* with the term υποσαλ, there were only six results, including the present one. The first one was Plutarch, *De defectu Oraculorum*, Stephanus page 434 C (§ 44 in the Loeb edition), where the context refers to an earthquake. We find then two further instances of the word ὑπόσαλος/hyposalos being used as an adjective, however meaning 'loose teeth' (Dioscorides Pedanius, 1.105.5 and 5.102.2). The other two fragments include participles with the verb ὑποσαλεύω/hyposaleuo.[245] The widest-used dictionaries, such as *LSJ* and *Bailly*, also record the use of ὑπόσαλος/hyposalos as an adjective. However, the meanings recorded by the dictionaries are not satisfactory in this context.[246] It does not make sense that the island would be submerged, as these dictionaries seem to suggest. My guess in order to make sense of such a complex sentence would be that the waters around the islet are less (ὑπο-) agitated (-σάλον), and therefore able to support ships (the *Stadiasmus* probably would not note the islet if it had nothing to do with sailing). Compare as well the existence of other terms such as ὕφορμος/hyphormos, also consisting of the prefix ὑπό.

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[243] Although it is out of the chronological range of this thesis, a good example of an earthquake is Euripides, *Iphigenia at Tauris*, 46: χθονὸς δὲ νῶτα σεισθῆναι σάλωι; *the surface of the earth shook with an earthquake*.

[244] There are multiple instances in the literature to be found of the combination of some form of the verb σαλεύω/saleuo and τεῖχος / τείχη (teikhos / teikhe). In Diodorus Siculus see, for example: 15.34.4, 16.74.3, 17.22.3, 17.45.2 and 22.10.7; cf. also variations like ἐσάλευσε τοὺς πύργους in 17.24.4

[245] Eusebius, *Historia Ecclesiastica*, 9.9.10 and 10.4.14.

[246] S. v. ὑπόσαλος, LSJ: «under the sea»; Bailly: «qui a les flots sous lui … sous-marin».

Stadiasmus, 128 records some κοιτῶνας in connection with a σάλος/salos. The word κοιτῶνας is a corruption for κώθωνας.[247] This would be due to κώθων being a word unknown to the scribe. Κώθων is the name that also received the port of Carthage, with Carayon et al. (2017) arguing that a κώθων-type port would be an excavated one of Punic type. The question remains open as to why this word would be in plural in this context. Kiesling translates it as 'berths', which certainly works in this context. However, ultimately, the Cothon was originally the proper name of the Carthaginian port, and if we compare it to Appian's descriptions of Carthage the doubt remains if it could refer to one or both basins of the double complex – but in perspective 'berths' does not seem an adequate translation. In either case, what is clear in this fragment is that only small ships can reach the land. Therefore, bigger ships still had to put in outside of the 'harbour'. This would explain why the place is defined as a σάλος/salos, since bigger vessels are unable to anchor directly on land.

Finally, there are places named Σάλος/Salos or Σάλοι/Saloi quoted in the literature, such as in Pseudo-Scylax, 102 and Ptolemy, *Geographia*, 3.5.10, so this term also developed into a toponym in at least a couple of occasions.

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[247] A κοιτών is a bedroom, something clearly out of context in the Stadiasmus. For more discussion, see Carayon et al., 2017.

4.6 NAUSTATHMON

4.6.1 Introduction

A ναύσαθμον is the mooring-place used by the army.[248] Whether that is a port by itself or simply a zone within a larger civilian port will be discussed below. First of all, however, I would like to address the gender of this word. In all the passages examined, with barely a handful of ambiguous exceptions, the word is neutral: τὸ ναύσταθμον/to naustathmon. A masculine version, ὁ ναύσταθμος/ho naustathmos, usually refers to the fleet, i.e. the naval army, not to the physical space of the port. It may be, then, that we are facing a case of metonymy: from 'the navy' to 'the place where the navy is, the port', and thus the military harbour (τὸ ναύσταθμον/to naustathmon) would receive its name from the military units making use of it (ὁ ναύσταθμος/ ho naustathmos).[249] An intermediate ambiguous case is presented in Appian, *Punic Wars*, 577.[250]

To summarise, the anchorage used by the army is usually a neutral word, τὸ ναύσταθμον/to naustathmon. In some cases, however, it may be a masculine word derived from 'the fleet' that makes use of that physical space, ὁ ναύσταθμος/ho naustathmos. This is because a change in meaning was being produced, from the user to the object of use. This process of metonymy is not complete, and this is the reason why we have ambiguous passages like the one just quoted.[251]

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[248] Reddé (1986) p. 148: «La création de ports exclusivement militaires est extrêmement rare dans l'Antiquité, ce qui explique, peut-être qu'il n'existe pas de vocable en grec ou latin pour designer de telles installations.» This statement is not entirely correct, given the existence of the word ναύσταθμον/naustathmon in Greek, as we will see in the course of this chapter. However, Reddé is right in saying (p. 145) that any civilian port could act as a military zone in war circumstances.

[249] A very complex case in this gender change from masculine to neutral is found in Strabo, 15.2.3, where we find the expression τοὺς ναύσταθμα/naustathma, with the masculine τοὺς but the noun declined as a neutral. While it is possible that there is a confusion in the gender of the military port, it is more plausible to understand τοὺς not as an article but as a pronoun, i.e. not as "Alexander sent (them) to make *the* naval stations" but as "Alexander sent *them* (= his soldiers) to make naval stations". This is in cosideration of the previous clause in the text, although I acknowledge that that structure would be more visible with a distributory τοὺς μὲν ... τοὺς δὲ or simply with the τοὺς δὲ ("Alexander sent some men to dig wells and some others to make naval stations").

[250] 18.122 in other editions.

[251] Some editors, however, have attempted to correct the text into the neutral form in order to make it non-ambiguous. For instance, Cassius Dio, 40.1, where we read τὸν ναύσταθμον/ton naustathmon (masculine: the fleet) in the codex Mediceus Laurentianus 70.8, whereas Reiske corrected τὸ ναύσταθμον/to naustathmon (neuter: the port of the fleet).

4.6.2 An etymological note

The word ναύσταθμον/naustathmon is clearly a compound. The first element is, of course, ναῦ(ς), meaning 'ship'. The second element is σταθμός. This second lexeme is related to the same root found in Latin *stare*, English *stand* or German *stehen*. Primarily it referred to a "standing-place" or "staying-place", and it is also related to herds of animals or places where animals are kept.[252] From this idea of "dwelling for a multitude of individuals", the meaning evolved to the place where the army had its headquarters, i.e. the military camp. Finally, of course, by attaching the word ναῦς in the beginning, the 'naval military quarters'.

4.6.3 Ancient definitions of the term ναύσταθμον

The word ναύσταθμον/naustathmon is documented in historical sources as early as Thucydides (e.g. 3.6.2 or 6.49.4). However, many instances of the term ναύσταθμον/naustathmon refer to the Greek camp in the Trojan War. This word, however, is never found in Homer, which points to a more recent chronology. A first definition of the term is found in the *Suda*:

Suda, *ny*, 78	
Ναύσταθμον: τὸν λιμένα. ἐφράττοντο δὲ καὶ δέρματι οἱ τόποι πρὸς τὸ μὴ βλάπτεσθαι τὰ σανιδώματα. ἢ ὅτι ὁ ναυτικὸς στρατὸς ναύσταθμος καλεῖται.	*Naustathmon*: the *limen*. These places were fenced with a skin, so that the planking wouldn't be damaged. Or because the naval army is called *naustathmos*.

As we can see, the *Suda* confirms the linguistic metonymy explained above. As for the fencing with skins, it is certainly a protective structure, but it is inconclusive in regards to the military function, since elements to prevent damage to parts of the harbour would certainly also be used in civilian ports.

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[252] Cf. Pokorny (1994³), s.v. *stā-:stə*, D, 8; Bailly, LSJ s.v. σταθμός.

4.6.4 General outline of the term ναύσταθμον

The definite clue is in the last sentence in the passage above: ναυτικὸς στρατός, the navy. In this sense, although most of the times only implicitly, all the information relating to the ναύσταθμον/naustathmon is related to naval military actions or structures, such as in the following cases. Firstly, Polyaenus, *Stratagemata*, 3.10.17 situates ναύσταθμον/naustathmon in the context of war. Secondly, Diodorus Siculus, 13. 96.2 reports how Dionysius proclaimed himself a tyrant of Syracuse, and Diodorus hints that he needed the army to assure his dominance, which is the reason why he established a ναύσταθμον/naustathmon. Finally, Strabo, 14.2.5 informs us that entering a ναύσταθμον/naustathmon could be punished by death.

Was a ναύσταθμον/naustathmon the whole harbour or just a militarised zone within a larger civilian space? The literature seems to indicate it is rather a zone in connection with a nearby unit or within a larger unit, the λιμήν/limen. Some relevant passages include Strabo, 12.3.11, 13.1.51, 13.3.5, 14.1.14, 14.2.15; Diodorus Siculus, 14.86.3.

The text of Strabo, 14.2.15 above hints at another clue. An emphasis is placed on the large capacity of the ναύσταθμα/naustathma to allocate warships. Similar references in the same Strabo include 9.1.15, 9.2.8, 14.1.35. The question remains open of how many ships the port needed to host in order for it to be referred to as a ναύσταθμον/naustathmon. The capacities, however, may be relative and depending on the possibilities and military significance of each territory. In addition, the strategic military value of the ναύσταθμα/naustathma is emphasised in that they are not only located in big cities but also in places otherwise unimportant or newly conquered, not to mention the transformation of other ports in ναύσταθμα/naustathma to suit war purposes or their relation with kingly or military power structures. The following fragments will illustrate the point:[253] Strabo, 8.6.13, 9.5.15, 13.1.31, 17.1.16; Arrian, *Anabasis of Alexander*, 6.18.2; Cassius Dio, 40.1 and 50.12.2

Sadly, we do not have any mentions of specific military structures, be they defensive or offensive, in explicit connection with a ναύσταθμον/naustathmon. An example of those might be in Ps.-Apollodorus, *Epitome*, 4.3, where he states that the Greeks built around their ναύσταθμον/naustathmon in Troy a τεῖχος (walls) and a τάφρον (pit). However,

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[253] The passages by Arrian and Cassius Dio are not situated in the Mediterranean, but they are however still relevant to illustrate the point.

this example cannot be taken as paradigmatic because it is copying the *Iliad* (7.448-450),[254] and secondly, because the environment is mythical, not historical. In the historical period, there are testimonies of defensive structures built by the army on setting up the naval camp, despite the camp itself not being directly referred to as a ναύσταθμον/naustathmon, such as Diodorus Siculus, 11.20.3.

The kind of infrastructure to be found in the ναύσταθμον/naustathmon would also depend on whether they are made on purpose or else suit a necessity of the moment. Whereas some settlements are built ex professo, such as Forum Iulii (present-day Fréjus in France), others are adapted from the facilities available due to the circumstances of war. A couple of good examples of this issue are Strabo, 4.1.9 and 4.5.2.

4.6.5 Further information to be found in ancient literature

A couple of texts (Plutarch, *Pompey*, 24.3 and Strabo, 14.3.2) suggest ναύσταθμα/naustathma could also be used by pirates. In the semantic aspect, then, the word would have evolved from "armed port used by the navy" to simply "armed port", regardless of who is using it, and thus could refer to a piracy base inasmuch it was some kind of stronghold. We must also take into account that pirates functioned as regular armies, and they even used the same warships as the navy (triremes), and these ships required a regular maintenance infrastructure, therefore a ναύσταθμον/naustathmon type harbour.[255]

Elsewhere, we have various documents of places called Ναύσταθμος or Naustathmus, in a Latinised version. This, of course, hints at the origins of the place as a military naval base, in the same way that we have places named after land troops, such as the Spanish cities of León (< *le(gi)on(em)*) or Castro Urdiales (< *Castrum Vardulies*). A place named Naustathmos or Naustathmos Limen can be found in several passages in literature, such as Ptolemy, *Geography*, 4.4.5; *Stadiasmus* 51 and 52; Ps.-Scylax, 108. Places called Naustathmus are also found in three passages in Latin literature (Livy, 37.31.10, Pomponius Mela, 1.40 and Pliny, *Natural History*, 3.88-89).

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[254] οὐχ ὁράᾳς ὅτι δ' αὖτε κάρη κομόωντες Ἀχαιοὶ / τεῖχος ἐτειχίσσαντο νεῶν ὕπερ, ἀμφὶ δὲ τάφρον / ἤλασαν, οὐδὲ θεοῖσι δόσαν κλειτὰς ἑκατόμβας; - Poseidon speaking to Zeus: "Can't you see that the long-haired Achaeans / have built a wall in front of their ships, and around it a pit / they have drawn, without giving glorious hecatombs to the gods?".

[255] For further information on piracy, see: Gabrielsen, 2001.

4.7 AIGIALOS

4.7.1 Introduction

Rougé (1966 : 112) defines the term αἰγιαλός/aigialos in barely seven lines of text as a place for smaller ships that can be towed aground, a beach without any harbour infrastructure. However, αἰγιαλοί/aigialoi are still a useful form of coast, as sailors can find drinking water there, and so the *Stadiasmus* indicates them very carefully.

Finzenhagen (1939 : 136-137) dedicated a few paragraphs to this kind of anchorage. His observations are mainly etymological, as will be discussed later. He describes the αἰγιαλός/aigialos as a flat, sandy beach and provides several literary quotes from Homer and Herodotus. Most notably, Finzenhagen quotes the following passage that hints that an αἰγιαλός/aigialos could well be found as an extension of a λιμήν/limen:

Xenophon, *Anabasis*, 6, 4, 1	
Ταύτην μὲν οὖν τὴν ἡμέραν αὐτοῦ ηὐλίζοντο ἐπὶ τοῦ αἰγιαλοῦ πρὸς τῷ λιμένι.	That day they slept in the open in the *aigialos* by the *limen*.

In fact, while *Stadiasmus* 134 does connect the αἰγιαλός/aigialos with a λιμήν/limen, this periplus quite often puts the αἰγιαλός/aigialos in relation with ὅρμοι/hormoi, as the texts quoted in the accompanying materials show, suggesting that the αἰγιαλός/aigialos could often be taken for a part or an extension of those.

4.7.2 An etymological note

Finzenhagen (1939 : 135-136) points out two possibilities, which I shall summarise here. According to him, traditional scholarship derivates the word αἰγιαλός/aigialos from ἐπ' αἰγὶ ἁλός, meaning roughly 'upon/against the wave of the sea'. However, Finzenhagen very rightly states that this phrase is not transmitted anywhere in the Greek literature. Another problem would be how to justify the meaning of αἰγί as relating to the port. In this sense, Finzenhagen reminds us of the *Lexicon* of Hesychius:[256]

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[256] In a quick search of the word αἴξ in *LSJ*, we will find, of course, that its meaning is 'goat'. However, two marginal passages are adduced by it that might look promising in relation to the sea. Firstly, Aristotle, *History of the Animals* 593b line 23, where αἴξ seems to designate a kind of water bird, possibly a goose. Secondly,

Hesychius, *Lexicon*, alpha 1700	
αἶγες· τὰ κύματα. Δωριεῖς	*aiges*: the waves. The Dorians [use this word].

Finzenhagen explains that some authors have understood the possible (and unattested) phrase ἐπ' αἰγὶ ἁλός as a figurative image in its origins. Furthermore, Pisani[257] adduces similar examples in Italian dialects, and goes on to mention two words that would designate winds. Those are ἐπαιγίζων and καταιγίζων, referring to winds that would respectively cause small and big waves. However, Finzenhagen, in his exhaustive work, formulates three major objections to the above:

> ➢ The names of winds seem to be participles of verbs. If the origin is the phrase ἐπ' αἰγὶ ἁλός, the transition from the image to the verb is difficult to understand.
>
> ➢ *αἴξ meaning 'wave' is only a dialectal use.[258]
>
> ➢ The ending −αλος could be similar to that in ὀμφαλός etc., but according to Finzenhagen, the observation of Bechtel seems more likely. Quoting Bechtel, he states that the ending would be related to the same root as the Greek verb ἅλλομαι, or Latin *salire*. If this was the case, the whole word cannot be directly derived from *αἴξ. The *Etymologicum Gudianum* mentions that αἰγίς is also a name for the sea, although the primary meaning of the entry is a weapon for Zeus and Athena made of goatskin.[259]

Finzenhagen, although he seems to quote Bechtel as the most likely theory, is inconclusive as to what hypotheses he is more inclined to give credit to. I checked the reference to Bechtel (1914, s. v. αἰγιαλός), and there is one very important issue worthy of notice that Finzenhagen omitted: Bechtel *cannot explain the accent* being placed in the final syllable, were his theory correct.[260] As linguistic research shows, accents are not placed at random,

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Artemidorus, *Onirocriticon*, 2.12, uses αἶγες. LSJ translates this as 'waves', but a simple look at the passage will show that Artemidorus is talking about goats or maybe sheep, so this passage should definitely be discarded.

[257] This reference is found in Finzenhagen's lemma, unfortunately I have been unable to check it personally.

[258] *αἴξ has to be quoted with an asterisk due to the fact that the nominative singular with the meaning "wave" is unattested. The nominative singular αἴξ does exist, but it means 'goat'.

[259] Αἰγίς· ὅπλον Διὸς καὶ Ἀθηνᾶς τι κροσσωτὸν ἐξ αἰγὸς δέρματος γεγονός. αἰγὶς καὶ ἡ θάλασσα εἴρηται. I must add that, some entries after this, we have a definition of αἰγιαλός/aigialos based on the image of the earth against the sea. Unfortunately, the linguistic foundations of that second entry are not very strong as it is based on a folk etymology.

[260] Bechtel, 1914, s.v. αἰγιαλός/aigialos: Die Schwierigkeit, die bleibt, liegt in der Betonung: ich kann nicht sagen, warum das Wort, so aufgefaßt, auf der Endsilbe betont ist.

but in a systematic way. The accent is also strongly dependent on specific linguistic evolution. Thus, the fact that the accent in the final syllable of αἰγιαλός/aigialos cannot be explained according to a certain theory is a good indicator that the theory might not be fully correct. This is in no case due to erroneous research practices, but possibly to a lack of information, as Bechtel's hypothesis is right in its general outline. Let us examine the words more carefully:

Bechtel says he sees a compound noun in αἰγιαλός/aigialos, and I believe he is right in this observation, but some precisions can be made. Quoting Döderlein, Bechtel links that word to ἄλλομαι. This –αλός in αἰγιαλός/aigialos ultimately derives, of course, from Indo-European *sal-o-, and it is in the same root, for instance, as ἅλς (hals, 'salt, salt water', by metonymy, 'the sea', genitive ἁλός/halos), and it also appears in compounds like ἔφ-αλος/ephalos.[261] The latter is a compound with ἐπί/epi as a prefix (where the iota is lost by apocope and the pi becomes aspirated to compensate the aspiration in alpha provoked by the fall of the sibilant). The fact that the accent in ἔφαλος/ephalos does not lie in the last syllable may be explained by the very own fact of it being formed by attachment of a preposition, as the accent of substantives and adjectives tends to become advanced in composition by attachment of prefixes.[262] The αἰγι- part in αἰγιαλός/aigialos is however *not* a prefix, but a full lexeme, which could well be the reason why the accent is not placed in the first half of the word.[263] Following this argumentation, then, the second half of αἰγι-αλός is the same root as ἅλς, 'the sea', probably in the root ἁλ- with the nominal suffix –ος.

As for the origin of αἰγι-, *Bailly* gives us a clue s.v. αἰγίς, -ίδος/aigis, -idos. The first meaning of this lemma is "tempest, hurricane", which would well coincide with the unprotected condition of the αἰγιαλός/aigialos.[264]

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[261] ἔφαλος means 'on the sea'. For the Indo-European rood, see NIL, s. v. *sal-, and esp. n. 7. The same Indo-European root is at the origin of σάλος. See the chapter on that word for more details.

[262] See Smyth, 1920 § 178: «In composition the accent is usually recessive (159) in the case of substantives and adjectives, regularly in the case of verbs: βάσις ἀνάβασις, θεός ἄθεος, λῦε ἀπόλυε». The gramar can be consulted online at the Perseus Project website: http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.04.0007%3Apart%3D1%3A chapter%3D7%3Asection%3D11.

[263] Unless, of course, syntactic phonetics rules provoke the contrary. The placement of accents in ancient Greek is a complicated issue. For a concise guide, see: Vendryes (1938). I would also like to add that, unfortunately, some modern publications consulted during the research for this thesis have misplaced accents.

[264] Sadly, the example provided by the dictionary is wrong. The word αἰγίς is not found in Aeschylus's *Choephoroe* line 584 nor near it.

The relationship between αἰγί(ς) and the sea can be further clarified by toponymy. There are many maritime places whose names start with the syllable αἰγι-. We can see some in the following chart:[265]

ancient Greek name	*place*
Αἰγίνη	island in the Mediterranean (Aegina)
Αἰγιαλία	island between Cythera and Crete
Αἰγίλεια	small island near Euboea
Αἴγιον	coastal town in Achaia

By the reasons stated above, then, I consider it very likely that αἰγιαλός/aigialos is a compound with an element αἰγι- relating to unsheltered and unsettled waters plus −αλός, with the same root as ἅλς/hals, 'salt water, the sea'.

4.7.3 Ancient definitions of the term αἰγιαλός

Julius Pollux, the grammarian, mentions the word αἰγιαλός/aigialos in three different passages:

- 1.99: in his list of places on the seashore where you can drop anchor (χωρία ἐπιθαλαττίδια οἷς ἔστι προσσχεῖν), includes the αἰγιαλός/aigialos in the third position, after ἀκτή and ἠών.

- 1.115: when speaking about places where a storm can befall the ships (οἷς δ' ἔστι ναῦν περιπεσεῖν ἐν χειμῶνι). One of the places is a τραχὺς αἰγιαλός/aigialos, a rough or rocky *aigialos.* Note that the fact that it is rough has to be specified because, as we will see later, αἰγιαλοί/aigialos are "preferably" sandy.

- 9.28: listing the parts of a town that are by the sea (μέρη δὲ πόλεως τὰ μὲν ἐκ θαλάττης), the first one is the αἰγιαλός/aigialos, followed by ἀκτή and ἠων.

None of the above three passages provides substantial information about what an αἰγιαλός/aigialos is, other than that it is a type of coast. The *Suda* does not have αἰγιαλός/aigialos as a lemma. Αἰγιαλός/aigialos appears in etymological compilations a

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[265] Please note that Αἰγὸς Ποταμοί (Egospotamos) derives from αἴξ 'goat'. Note that it is formed by the genitive form of 'goat' and the word 'river', and it means "the river of the goat".

number of times, both as a lemma and as a definition (especially from ἠών – by influence of Pollux?) and many folk etymologies, such as the following:

Orion, *Etymologicum*, e cod. regio 2610 p. 174[266]	
<Αἰγιαλός> · ὁ ἐγγὺς τῆς ἁλός, ἤγουν τῆς θαλάσσης.	*Aigialos*: that which is near the salt-water, that is to say, the sea.

One lemma is however worthy of our notice:

Etymologicum Gudianum, alpha, p. 36	
Αἰγιαλός· ἐτυμολογεῖται παρὰ <τὸ> τὴν αἶαν γείτονα εἶναι τῆς ἁλός· ἐξ αὐτοῦ γράφεται διὰ τῆς αι διφθόγγου. ἐκ τοῦ αἶα, ὃ σημαίνει τὴν γῆν· τοῦτο ἐκ τοῦ γαῖα ἀποβολῇ τοῦ γ. ἢ ὁ ἐγγὺς τῆς ἁλός, ἤγουν τῆς θαλάσσης. ἢ παρὰ τὸ τὴν ἅλα ἐκεῖ κλᾶσθαι. ἢ παρὰ τὸ κατάγνυσθαι ἐν αὐτῇ τὰ κύματα, ἤτοι κλᾶσθαι, ὡς Ἀπολλόδωρός φησιν· ἄξαι γὰρ τὸ κλάσαι λέγεται. αἰγιαλός ἐστι μέχρις οὗ τὸ μέγιστον τῆς θαλάσσης ἐκτρέχει [ῥῆμα ἤγουν] κῦμα.	*Aigialos*: the word comes from the fact that the land is bordering the sea. Hence it (*halos*) is written by (attaching) the *ai*-diphthong, from *aia*, which means 'the land'. Either from the stuff from the sea clashing there or from the breaking of the waves in it, actually clashing, as Apollodorus says. Because the clashing is called *axai*. The *aigialos* is the place until which the open seas drag the current, or rather the wave.

The important part is the last sentence: the αἰγιαλός/aigialos is not the open seas, but there where the waves break, i.e. the coastline. Note that no harbour infrastructure is mentioned, thus implying that the αἰγιαλός/aigialos is a natural, not a human-arranged feature of the landscape.

Finally, I would also like to add that the word has survived in modern Greek as αιγιαλός and as γιαλός. Quite interestingly, both are defined with roughly the same meaning as in ancient Greek: the place of the land where the waves break[267].

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[266] Please note that the ἁλός reference is consistent with the actual etymology of the word, as we will see below.

[267] see the respective lemmas in Babiniotis, 2002.

4.7.4 Main characteristics of the αἰγιαλός

An αἰγιαλός/aigialos is not a major harbour form. Indeed, the basic meaning of this word is 'shore, beach', and this is the sense that it acquires most of the times. See, for example, Plutarch, *Sayings of the kings and emperors*, 183 A, where Mithridates is warned of an imminent plot to kill him by his enemy's son writing it on the sand of the αἰγιαλός/aigialos.

However, we have a substantial number of texts that attest to the function of the αἰγιαλός/aigialos as a place for mooring, even if perhaps not within a major hub. The best proof of this are the sailing guides, such as the *Stadiasmus*, where the word appears a dozen times. This periplus carefully documents them because most of the times they have drinking water available (paragraphs 32, 38, 54, 71, 82, 134). Other times, the αἰγιαλοί/aigialoi are in connection with human settlements, or human occupation. Sometimes this comes in the form of a town (54, 93, 346) or with certain infrastructures that denote human presence (38). In a few cases, though, the αἰγιαλός/aigialos is documented in relation to other (better?) harbour forms (38, 60, 341; 72; 134). Some αἰγιαλοί/aigialoi are especially noted for their depth, something that may have been unusual as there are only three mentions of this (60, 71, 72). However, the mere fact that the *Stadiamus* records such places is an indicative of the possibility of mooring or beaching there. Mooring in 'beaches' (for this is roughly what an αἰγιαλός/aigialos represents) is probably not ideal, but it is plausible and may well have happened due to necessity, for example in order to take drinking water or to take refuge from the stormy seas.

Information on the αἰγιαλοί/aigialoi is also provided by the medical textual corpus,[268] with all sources coinciding in three aspects:

1. An αἰγιαλός/aigialos is exposed to extreme weather phenomena (sun, winds, waves).
2. An αἰγιαλός/aigialos is preferably sandy, although there are some reports of rocky or muddy αἰγιαλοί/aigialoi.
3. Αἰγιαλοί/aigialoi are opposed to other water bodies, most notably the πέλαγος (the open sea) and ποταμοί (rivers).

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[268] Garcia Casacuberta (in press).

All of the above coincide with what we can find in other textual sources. Even when the other testimonies are focusing on another subject, for instance a battle, the background details all include one or more of the three points above. Few texts will suffice to illustrate this aspect:

- Extreme weather: Strabo, 9.5.22 (wind, shipwrecks); Dionysius of Halicarnassus, 14.1.5 (wind); Diodorus Siculus, 14.68.7 (storm); Flavius Josephus, *The Jewish War*, 3.419-422 (rocks, wind, high waves).

- Sandy: It is not always the case that the αἰγιαλός/aigialos is sandy, sometimes it can also be rocky (for example, in the text just above). However, in most cases the sand is the defining element of this type of shoreline, such as in Plutarch, *Pompeius*, 77.3, 78.3. Note also in this case that the coast is described by the term αἰγιαλός/aigialos because it was too shallow for larger ships to sail. Therefore, it is by no means a suitable harbour, and yet the persons in the text are using it as such, probably for lack of a better place (cf. Diodorus Siculus, 1.31.2-5, quoted in the Case-Study 1, who informs us that the Egyptian coast consists of a sandbank, and has no suitable ports apart from Pharos). Aristotle, *On the animals*, Bekker page 548a, documents different types of αἰγιαλοί/aigialos that provide a living environment for oysters.

- Opposed to πέλαγος, ποταμός: a good example of this is Diodorus Siculus, 1.45.1, opposing the αἰγιαλός/aigialos at Laurentum both to the Tyrrhenian sea and to the outlets of the Tiber.

In line with the extreme weather events, although the Mediterranean does not have particularly violent tidal variation, one issue that may occur as well is that ships run aground due to an unforeseen change in the tides. This is narrated, for instance, by Apollonius of Rhodes (4.1232-1273), although he does not use specifically the word αἰγιαλός/aigialos.

Very little evidence points against this idea of "coast exposed to extreme weather". One passage that is worth mentioning, though, is Arrian, *Anabasis of Alexander*, 2.20. In this passage, Alexander tries to launch a naval attack, but the people that are the target of the attack have blockaded the entrance to their harbour with ships, so Alexander is forced to anchor his fleet on a newly-built mole against the *aigialos*, 'where there seemed to be shelter

from the winds'. However, the αἰγιαλός/aigialos is still not the preferable place to anchor but an emergency solution, as the entrance to the port had been blocked, and in fact, probably the element that provides shelter is the mole, rather than the αἰγιαλός/aigialos.

Apart from the αἰγιαλός/aigialos used as a somewhat emergency anchorage, or an anchorage when nothing else is available, it must be borne in mind that fishing is also of importance. Clement of Alexandria, *Instructor*, 1.5.12.2 describes that Jesus instructs His disciples, who are fishing, while standing on the αἰγιαλός/aigialos. Probably no major harbour infrastructure is required for small fishing boats, so it is possible to perform fishing activities in unsheltered places such as the αἰγιαλός/aigialos:

Clement of Alexandria, *Instructor*, 1.5.12.2	
Ἐν γοῦν τῷ εὐαγγελίῳ· «σταθείς», φησίν, «ὁ κύριος ἐπὶ τῷ αἰγιαλῷ πρὸς τοὺς μαθητάς—ἁλιεύοντες δὲ ἔτυχον—ἐνεφώνησέν [τε], παιδία, μή τι ὄψον ἔχετε;»	Indeed, in the Gospel it says:[269] "the Lord was standing on the *aigialos* and he told His disciples, who happened to be fishing: 'Children, do you not have any food?' "

Unfortunately, there is not much literature about the specificities of fishing in the Graeco-Roman world, but the texts that did survive demonstrate that fishermen made their living in αἰγιαλοί/aigialoi. That was firstly to avoid the massive traffic, which would have represented a serious hindrance in port complexes like λιμένες/limenes or ἐμπόρια/emporia, and secondly, due to the fishing techniques of the time (see Bekker-Nielsen, 2006).

4.7.5 Further information to be found in ancient literature

Plutarch, *Antonius*, 7, may present some difficulty. The passage depicts extreme weather conditions (winds, swelling of the sea) capable of wrecking a fleet. However, we are told that the south-west wind (λίψ) was blowing *from a bay*. This comes as a surprise because bays are a priori well-sheltered places, safe from the elements and the impacts of sea. Nevertheless, we are told a bit later in this passage that Mark Antony headed to the town of Lissus, which he conquered. Both Brundisium and Lissus find themselves at the entrance

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[269] John, 21. The word used there is also αἰγιαλός/aigialos. The scene happens in Lake Tiberias / See of Galilee: τῆς θαλάσσης τῆς Τιβεριάδος.

of the Adriatic basin, in an area where its water currents join or contrast those of the main Mediterranean basin (see Figure 26).[270] This could explain why, despite the fact that Lissus finds itself inside an (open) bay, the voyage from Brundisium is dangerous, especially in the winter season as we are told. The αἰγιαλός/aigialos in that text could simply be the shoreline, but it is significant that the wrecks of the ships are washed there after the storm, in line with the rest of the literature.

Figure 26. Current flows in the Mediterranean. Image from Nasa Scientific Visualisation Studio, with the addition of Brundisium and Lissus.

Until here literature seems to suggest that the αἰγιαλός/aigialos was not a major form of port. This does not mean, however, that it wasn't an important one, as artistic documents also show. Indeed, Arnaud (2016a : 3) points to a famous mosaic of Susa[271] showing a ship in the process of unloading after it has been beached. Because of this, he argues, beaches must also be considered as a major form of port. In other words, while an αἰγιαλός/aigialos does not seem to have been one of the preferred harbour forms, this mosaic shows that it still played an important role on the everyday functioning of maritime trade.

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[270] Source for the background map: https://svs.gsfc.nasa.gov/3820, consulted: 30th May 2017.
[271] See Dunbabin, 1978, p. 269, pl. XLVIII, fig. 119-120.

4.8 ANKYROBOLION

4.8.1 Introduction

A search within the *TLG* texts with the term αγκυροβολ produced only 21 results[272].
Some were, however, not valid for the scope of this project and others need to be used very
carefully:

1. Two of the texts were of too late a date for the time scope of this project. Those
   were namely Michael Psellus, *oration* 1; and Michael Glycas, *Quaestiones in
   Sacram Scripturam*, chapter 16.

2. One of the results was a fragment attributed to Posidonius. This author's work,
   however, is not extant as a direct source. Due to the constraints of what literature
   can actually be traced back, I believe it is more sensible to work with this passage
   as it is found in the well-preserved version of Strabo. In other words, Posidonius,
   frag. 87 Jacoby is to be read from Strabo, 1.3.18. Strabo is the source I will focus
   on due to its better state of preservation.

3. Plutarch, *De Garrulitate*, 507b needs to be read with caution, as the use of this
   word in that particular context is metaphorical.

4. Rather than 21 different passages, what the *TLG* search produced were 21
   different *instances* of the word, for it appears twice in the entry alpha 583 of
   Hesychius's *Lexicon*. In addition, this source is not useful for the port category, as
   it defines the term ἀγκυροβόλον/ankyrobolion, which refers to a modality of
   paying taxes.[273]

5. A total of six passages from the *Periplus Maris Erythraei* (the *Circumnavigation of
   the Red Sea*) appeared within the results of the search. But in fact, there are only
   three passages in this work mentioning ἀγκυροβόλια/ankyrobolia. Since the *TLG*
   contains two different editions (those by Müller and Casson), the same three

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[272] Search performed on performed on the 1st, June 2015.

[273] As I explained, the search term that I typed into the *TLG* menu was αγκυροβολ. As I didn't type the full
word, it is logic that some invalid results will appear. Hesychius's lemma reads like this: Ἀγκυροβόλῳ
δείπνῳ· ἀγκυροβόλα Φοίνικες τὰ δεῖπνα, ἃ παρασκεύαζον τοῖς τελώναις ἐκ τῶν λιμένων. ἔστι δὲ καὶ
μισθός· ἔπρασσον γὰρ ἐν τοῖς λιμέσιν ἐνόρμιον καὶ ἐνλιμένιον ὡς ἐκλογήν. This translates as follows: *by
provision of anchor-dropping: the Phoenicians call 'anchor-dropping'* (agkyrobola) *the provisions* (deipna)
that they prepare for the tax-officers in the limenes. *There is also an economic contribution* (misthos). *For
they set a tax on entering the* hormos (enormion) *and on entering the* limen (enlimenion) *in the* limenes *as a
means of levying taxes.*

passages have been duplicated in the results. While the Red Sea is a different geographical unit from the Mediterranean, I believe its examples are significant and complete. Therefore I have decided not to reject them.

6. Hypolitus, *Chronicon,* 268 is the same as *Stadiasmus*, 25, but with a different target toponym (respectively: ἐπὶ Δαρείου and ἐπὶ Τυνδαρείους). The proper toponym is probably Tyndareioi, and it refers to some islands off the coast of Africa, near Egypt. Hyppolitus may have copied his text from a corrupt copy of the *Stadiasmus*, or else he may have committed the error himself (note: τυν-δαρειου-ς, as well as the similarity with the person name).

While bearing this in mind, let us now examine what information is to be found in the texts. I will first comment on the coincident points and examine physical locations at the end of this chapter.

4.8.2 An etymological note:

The word ἀγκυροβόλιον/ankyrobolion is a clear compound from the word for *anchor,* the verb *to throw / to drop* and the suffix –ιον that indicates a place:

βάλ(λω)

(o-gradation)

βολ

ἄγκυρα   linking vowel   suffix = 'place'
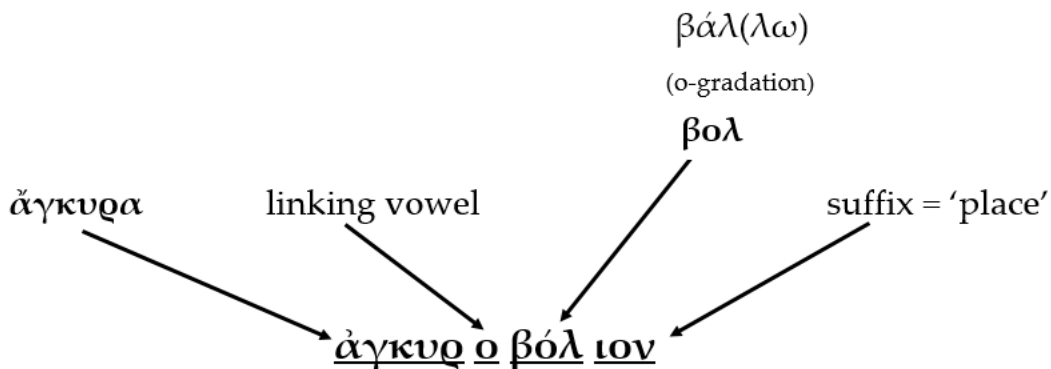
ἄγκυρ ο βόλ ιον

Therefore, an ἀγκυροβόλιον/ankyrobolion is literally the place where to drop anchor.

4.8.3 Ancient definitions of the term ἀγκυροβόλιον

As far as I am aware, no ancient definitions of the term ἀγκυροβόλιον/ankyrobolion are extant. Please note that Hesychius, alpha 583 defines ἀγκυροβόλον/ankyrobolon, not ἀγκυροβόλιον/ankyrobolion.

Nevertheless, ἀγκυροβόλιον/ankyrobolion features as the explanation for two other words in the same Hesychius:

Lexicon entry	text
epsilon 3209	ἐννοδίῳ· ἀγκυροβολίῳ[274]
nu 184	νέαον[275]· ἀγκυροβόλιον

Pseudo-Zonaras, *Lexicon*, s. v. ἀγκυροβόλιον/ankyrobolion is somewhat misleading. Quite interestingly, this lemma is defined as τὸ σίδηρον τοῦ πλοίου, 'the iron of the ship'. As explained in 4.8.2, ἀγκυροβόλιον/ankyrobolion is a compound from the words anchor and to throw, thus defining a place where to drop anchor. It might be that in later times some semantic confusion appeared between the place and the object, and so ἀγκυροβόλιον/ankyrobolion would refer to the anchor itself. As for the ἀγκυροβόλιον/ankyrobolion as an iron part of the ship related to the anchor, it could be a number of things. Firstly, it could refer to the hook of the anchor itself, which was made of metal (or metal and wood). Lead stops being available after the 4th century AD. The 'iron' could also refer to the chain of the anchor, but this is unlikely as sometimes anchors were attached with ropes. However, on the bow of the ship there was another iron part, the hawser, which was the place where the anchor would be collected when not on use. The hawser would be connected to some sort of implement inside the ship for reinforcement, and that implement could also be made of iron. In order to prevent the anchor from swinging about while sailing, the ship included another part, the cathead, a projecting beam where the anchor would be tied to during the journey, but the cathead was generally made of wood.[276] So what the ἀνγκυρόβολιον referred to in this lexicon is either the hook of the anchor or, in my opinion more likely, the hawser.

4.8.4 Main characteristics of the ἀγκυροβόλιον

The most recurrent feature, which is to be found even in the metaphorical text of Plutarch, is the comparison of the ἀγκυροβόλιον/ankyrobolion to other harbour forms. Sometimes

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[274] There seems to be a corruption in this particular place. This passage corresponds to an explanation of Homer, *Odyssey*, 4.785 and ibidem 8.55, but what the verses actually read is ἐν νοτίῳ. Whether the error has occurred as a result of a mistake during the copying or is it due to lexical confusion I cannot tell for sure. The dictionaries only quote this particular passage when they define ἐν νοτίῳ as a mooring-place.

[275] This is the only instance of the word νέαον that I have been able to find in *TLG*.

[276] I thank Peter Campbell for his kind explanations.

it is hinted that the ἀγκυροβόλιον/ankyrobolion and the other harbour form are not the same, other times the texts seem to suggest that one is inside the other. A summary can be found in the following chart:

passage	the ἀγκυροβόλιον ...				
	λιμήν	ὅρμος	σάλος	ἐμπόριον	ναύσταθμον
Plutarch *De Garrulitate*, 507 b		ὁ. different from ἀ.			
Periplus Maris Erythraei, 7		includes ἀ. and σ.	σ. different from ἀ.		
Periplus Maris Erythraei, 24	is ἀλίμενος	is εὕορμος	is εὕσαλος	contains many ἀ.	
Stadiasmus, 25					
Strabo, 1.3.18	is no longer a λ.				
Strabo, 3.4.7	ἀλίμενος				Eratosthenes: Tarraco has a ν., Artemidorus: it doesn't even have an ἀ.[277]
Strabo, 4.6.2	λιμήν προσεχής, ἀλίμενος...	... except for shallow ὁ. and ἀ.			
Strabo, 16.4.18	the coast has no λ. nor ἀ.				

[277] This complicated passage has been quoted for many years. The first source of Strabo, Eratosthenes, was writing in the time of the Punic Wars, so it is comprehensible that he would state that Tarraco has a ναύσταθμον/naustathmon – a military port. The second source, Artemidorus, is more confusing, because we do have evidence of the fact that Tarraco had port installations, so on what grounds does Artemidorus state that Tarraco lacks even an ἀγκυροβόλιον/ankyrobolion? Just before these two statements, Strabo says that the whole eastern coast of Spain is ἀλίμενος/alimenos. This is also a surprising piece of information if we take into account the outstanding natural sheltered bay in what is now Cartagena and also the good harbour in Dertosa (present-day Tortosa, in Catalonia, Spain). It is also strange that Strabo does not mention Dertosa (the delta of the Ebro was still not formed, so it was a harbour for sea ships), which is connected to the Ebro and hence, to an important part of the Peninsula (remember the remarkable fluvial port in Caesaraugusta – Zaragoza, as well as other anchorages along the river), and mentions instead Tarraco, whose river is the Francolí, a short, small and unimportant course of water which is not connected to any other major human centres. The most plausible explanation is a problem with the sources of Strabo, as he never visited the Iberian Peninsula himself. For the coast of the ancient province of Hispania Tarraconensis, see Pere Izquierdo (1990, and 2009a and b). Still, the "alimenic" character of the port in Tarraco has recently been demonstrated thanks to archaeological sediment coring by the Portus Limen Project (Salomon et al., forthcoming). The results of the cores had no fine clays, and contained only relatively bigger kinds of sands, something that proves a high energy environment and confirms the presence of a strong swell, as Férreol Salomon kindly confirmed on personal comment.

Notes:

1. Section 15 of the *Periplus Maris Erythraei* situates the ἀγκυροβόλια/ankyrobolia in rivers. Casson puts the whole expression διὰ ἀγκυροβολίων ποταμοὶ inter cruces. Müller, *Geographi Graeci Minores* vol. 1 p. 268 indicates that this is the reading found in the codex, but he considers the passage to be corrupt. The corruption is due especially to syntactical reasons, as the nominative ποταμοὶ has no place in the context.

2. *Stadiasmus*, 25 (and the corresponding passage from Hyppolitus's *Chronicon*) does not compare the ἀγκυροβόλιον/ankyrobolion to any other body of water.

3. Hesychius, *Lexicon*, epsilon 3209 defines ἐννοδίῳ as ἀγκυροβολίῳ, as we have seen above.

4. Hesychius, *Lexicon*, nu 184 defines νέανον as ἀγκυροβόλιον/ankyrobolion, as we have also seen above.

Now, ἐμπόριον/emporion and ναύσταθμον/naustathmon are functional terms, namely the market-port and the maritime military base.[278] However, when sources speak about ἀγκυροβόλια/ankyrobolia, they provide many more details about the geography. Since the fact that a place is destined for a certain use does not exclude some typical topographical features, we must consider that ἀγκυροβόλιον/ankyrobolion is a geographical term rather than one referring to function. Before we examine further physical characteristics of the ἀγκυροβόλιον/ankyrobolion, let me briefly comment on the bodies of water we have seen so far.

- An ἀγκυροβόλιον/ankyrobolion is not a λιμήν/limen and also not inside or near a λιμήν/limen. All the sources that explicitly mention the concept of λιμήν/limen do it in order to deny its presence or state its absence. Thus, for instance, Strabo 1.3.18 (καὶ ἡ Ἀστερία ἤλλακται, ἣν Ἀστερίδα φησὶν ὁ ποιητής "ἔστι δέ τις νῆσος μέσσῃ ἁλὶ πετρήεσσα, Ἀστερίς, οὐ μεγάλη, λιμένες δ' ἐνὶ ναύλοχοι αὐτῇ ἀμφίδυμοι·"[279] νυνὶ δὲ οὐδ' ἀγκυροβόλιον εὐφυὲς ἔχει.), or 3.4.7 (Μεταξὺ δὲ τῶν τοῦ Ἴβηρος ἐκτροπῶν καὶ τῶν ἄκρων τῆς Πυρήνης, ἐφ' ὧν ἵδρυται τὰ ἀναθήματα τοῦ Πομπηίου, πρώτη Ταρράκων ἐστὶ πόλις, ἀλίμενος μὲν ἐν

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[278] See the specific chapters for further details.
[279] This is a partial quote from Homer, *Odyssey*, 4.844-847.

κόλπῳ δὲ ἱδρυμένη […] Ἐρατοσθένης δὲ καὶ ναύσταθμον ἔχειν φησὶν αὐτήν, οὐδὲ ἀγκυροβολίοις σφόδρα εὐτυχοῦσαν, ὡς ἀντιλέγων εἴρηκεν Ἀρτεμίδωρος).

- An ἀγκυροβόλιον/ankyrobolion is not a σάλος/salos (*Periplus Maris Erythraei*, 7), but it may have some of its qualities (*Periplus Maris Erythraei*, 24).

- The relation of the ἀγκυροβόλιον/ankyrobolion in regards to the ὅρμος/hormos is not clear from these textual sources. Plutarch and Strabo seem to state that those are two different entities. The *Periplus Maris Erythraei*, 7 hints that the ἀγκυροβόλια/ankyrobolia (as well as the σάλοι/saloi) are inside the ὅρμοι/hormoi, whereas ibidem, 24 describes the ἀγκυροβόλια/ankyrobolia as εὔσαλον/eusalon and εὔορμον/euormon.

The points above, together with the etymology of the word, suggest a place where the ship would be kept by dropping anchor. This would explain why the λιμήν/limen is denied: in a λιμήν/limen, cables would be used to secure the ship to land. It also explains the similarity with the σάλος/salos due to the fact that both are anchorages on water, σάλος/salos describing the agitated movement of the wavy sea surface. Finally, the word ὅρμος/hormos is related to the action of mooring with ropes or cables, as explained in 4.4.

Other topographical issues that the sources deal with are, for example, the depth of the ἀγκυρόβολιον. We have seen in one of the examples above that the waters are shallow. However, we are also explicitly informed that the place is deep enough for cargo vessels (*Stadiasmus*, 8), or else we can deduce such a depth (*Periplus Maris Erythraei*, 24, gives details about merchandise).

In addition, that last passage (*Periplus Maris Erythraei*, 24) notes that the sea-floor is sandy (ἀμμόγεια), thus pointing out that geology also plays a role. Similarly, notably in Strabo, 1.3.18, the author attaches an adjective for further precision, and so states that in his times the Island of Asteria doesn't even have an ἀγκυροβόλιον εὐφυές (ankyrobolion euphyes, 'well-formed').

Somewhat away of the strict harbour site, Strabo, 4.6.2 stresses the narrowness of the coast of Liguria due to the proximity with the ridge of mountains behind it. The same problem presented by the closeness to mountains and rocks, but worsened by seasonal rains and winds is indicated in 16.4.18. Climate conditions are also worthy of mention, for example in that same passage. Also, *Periplus Maris Erythraei*, 24: Πλέεται δὲ εἰς τὴν αὐτὴν

εὐκαίρως περὶ τὸν Σεπτέμβριον μῆνα, ὅς ἐστι Θώθ· οὐδὲν δὲ κωλύει κἂν τάχιον. A similar indication is to be found in *Periplus Maris Erythraei*, 7, which informs us that it is possible to anchor in the ἀγκυροβόλια/ankyrobolia or in the σάλοι/saloi according to the convenient moment (κατὰ καιροὺς ἐπιτηδείους).[280]

Finally, apart from the geographical features of the coast, we also learn from specific human-made infrastructure, such as watch-towers (σκόπελοι) in the *Stadiasmus* passage. Other human-related elements are the references to what merchandise can be sold or purchased in that port, such as the indications in the *Periplus Maris Erythraei*, 24.

4.8.5 Further information to be found in ancient literature

Unfortunately, there are so few instances of the word ἀγκυροβόλιον/ankyrobolion in ancient literature that it was impossible to provide extra information, i.e., features that may occur but are not essential. However, I would like to highlight several issues.

First of all, the very frequent association of the word ἀγκυροβόλιον/ankyrobolion with some specific other terms, namely ἀλίμενος/alimenos and ὅρμος/hormos. Out of the eight reliable passages examined above, five use the adjective ἀλίμενος/alimenos or deny the absence of a λιμήν/limen when they mention the ἀγκυροβόλιον/ankyrobolion. Four other passages relate it to ὅρμος/hormos: two of them (Plutarch's and Strabo's 4.6.2) state that they are different geographical realities, whereas those passage from the *Periplus Maris Erythraei* in one case states that the ἀγκυροβόλιον/ankyrobolion is a part of the ὅρμος/hormos and in the other, that the ἀγκυροβόλιον/ankyrobolion has the qualities of an ὅρμος/hormos by means of the adjective εὔορμος/hormos. The relationship with σάλος/salos is found only in these same two passages and explained easily as follows: the ἀγκυροβόλιον/ankyrobolion is not a σάλος/salos (passage 7) but it can have some of its qualities (passage 24). The associations with ἐμπόριον/emporion and ναύσταθμον/naustathmon are not problematic: those two are functional terms, whereas ἀγκυροβόλιον/ankyrobolion refers to some kind of physical shape or structure, since it is explained by relating it to the other geographical words (ἀλίμενος/alimenos, εὔορμος/euormos, εὔσαλος/eusalos …). In other words, we can talk about the see of parliament or the see of a bishop, and while *see* will always refer to the building, its function is not the same depending on who makes use of it (parliament or the bishop). In this sense,

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[280] Whether that "convenient moment" refers to the necessities of the ship or the seasons is unclear.

it is understandable that an ἀγκυροβόλιον/ankyrobolion can be used by the merchants (ἐμπόριον/emporion) or by the army (ναύσταθμον/naustathmon).

The second issue that stands out is the difference in the perception of the authors according to each place. If we compare the *Periplus of the Red Sea*, 24 with Strabo, 4.6.2, we will see that an ἀγκυροβόλιον/ankyrobolion is seen as good quality in the Red Sea but is looked down upon in the Mediterranean. The physical context provides an explanation to this change in perception. First of all, ἀγκυροβόλιον/ankyrobolion, as the name indicates, is literally the place where the ship drops anchor (ἀγκυρ-ο-βόλιον). If you attach the ship by means of cables in a port, the ship will remain stable. However, if you drop anchor on the sea, the winds, even if imperceptible, will move it. The text above describes a sandy sea-floor, which would be suitable for the anchor to catch. As Figure 27 shows, in the Red Sea, winds are rather predictable, so once the ship has dropped anchor, it is relatively easy to keep it in a regular position. In the Mediterranean, on the other hand, winds change, which is why a ship that is merely secured with an anchor will "spin around" according to the direction of the winds. Because of this reason, an ἀγκυροβόλιον/ankyrobolion in the Mediterranean is something unreliable, as the ship will not stand still, and therefore any operations (disembarking, unloading / loading merchandise…) will be extremely difficult, if not impossible.[281]

Wind forecast for Tarragona, 12th-13th Nov 2015

Wind forecast for Port Sudan, 12ᵗʰ-13ᵗʰ Nov 2015
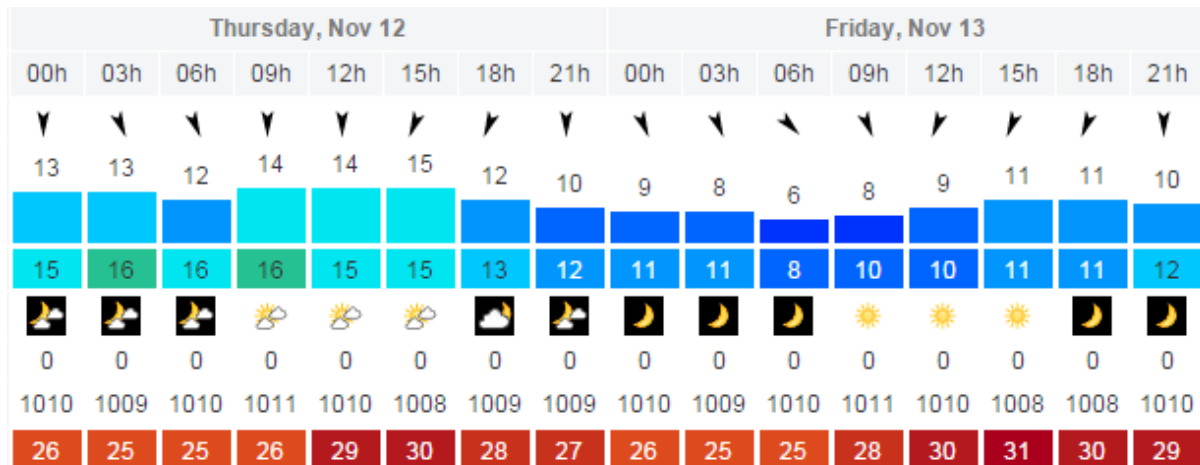
Figure 27. Comparing winds in Port Sudan (Red Sea) and in Tarragona (Mediterranean). Source: windfinder.com, accessed 12th-Nov-2015, 12.15h

This explains why the *Periplus of the Red Sea* lists the ἀγκυροβόλια/ankyrobolia as any other harbour form, whereas Strabo and his sources look down on them.

A search of the two members of the compound, ἄγκυρα and βάλλω, will also confirm the bad quality of this type of anchorages, even in some areas of the *Periplus of the Red Sea*. We can find warnings of the dangers of securing the ship only with anchors in the *Periplus of the Red Sea*, 43, referring to the Barygaza gulf, as there are strong currents in that area. That passage is illustrative of the dangers of dropping anchor, as the ship will probably remain unstable, especially if the ship is dependent on only one anchor. The bishop Synesius of Cyrene in one of his letters (4. ll. 172-177) laments the same issue.

Indeed, the ideal situation would have been to make the ship stable with three anchors. Thus, in whatever direction the wind was blowing from, the ship would have remained stable, much as if tied by cables in the port. In this context, however, Synesius tells us that they only had one anchor, for the second one had been swallowed by the current, and therefore the ship was trembling and in peril, probably moving like a pendulum. This

explains their happiness when they finally reached land, and further adds to the argument of the dangerousness of maintaining the ship only with an anchor.

4.9 PORTUS

4.9.1 Introduction

As Salway (2004 and 2007) argued, there are not many words in Latin to refer to anchorage places. In fact, after my research, I would rather say that there is only one word to refer to any form of harbour: *portus*. One other word, *statio*, is used occasionally for very specific purposes, as will be discussed in the next section. In the absence of both terms, the way to refer to the anchoring points is by the terms referring to the geomorphology, and especially *litus*, but whether the 'sea-shore' (for this is what *litus* means) can be considered a form of anchorage remains to be seen.

4.9.2 An etymological note:

Pokorny (1994³, **per* 2) proves previous theories in regards to the etymology of *portus*. Its basic root is an Indo-European word **per-*, best known for generating prepositions, like Latin *per* 'through' or Greek περί 'around' and, thanks to ablaut, also πρό 'towards'. The idea of movement is therefore embedded in this lexeme. With ablaut and a t-suffix, this root generates **per-tu, *por-tu*, genitive **pr̥-teus*, meaning something in the lines of 'passage', before becoming Latin *portus*. It is interesting to know that this sense of 'crossing' has also been preserved in the Romance languages, where a so-called 'mountain port' (e.g. in French, Spanish and Catalan) is a place for passage between two mountains.

4.9.3 Ancient definitions of the term *portus*

To my knowledge, the only intentional definition of a *portus* in Latin in antiquity is found in Justinian's *Digest*, 50.16.59.pr.1 (Ulpian). This passage describes a *portus* as a *conclusus locus, quo importantur merces et inde exportantur*, or an 'enclosed place, where merchandise is imported and exported'. Isidore of Seville (14.40) makes a similar point when he says that ports are called from the ex-*port* of merchandise. This basic definition proves again the point of the strategic commercial infrastructure.

What is strange about Ulpian's definition is that it does not say that the *portus* is a place on the sea or that the products are imported and exported by ship. One might think that

the usage of the verbs *importare / exportare* could be sufficient to indicate that the commerce is water-borne, but these verbs mean little more than "bring in, bring out". Therefore, is the paradigmatic way of transporting merchandise in and out of cities and regions is by means of sea? The following chart discusses some examples:

VERB	PASSAGE	CONTENTS	PLACE
both	Varro, *Rerum Rusticarum*, 1.16.2	Farms in Hispania and Lusitania are profitable as they can transport their produce. Many farms produce grain and wine, and if there is anything they are lacking, they bring it in (*quid desit importandum*), whereas many farms have some produce they send away to be sold (*aliquid sit exportandum*)	land
IM POR TARE	Caesar, *Civil war*, 3.40.4	Naval war struggles. Laelius prevents the importation of supplies into Oricum (*commeatus Byllide atque Amantia importari in oppidum prohibebat*).	sea (implicit)
	Caesar, *Civil war*, 3.42.5	War struggles. Officers are are sent to find food supplies. There is barely any grain in Lissus because the terrain is unsuitable for agriculture, and therefore the city of Lissus "makes use of imported wheat" (*frumento utuntur importato*).	sea (implicit)
	Caesar, *Gallic war*, 4.2	The Germans allow traders into their territory to sell off the booty they have gained through wars, rather than because they wish to import Roman produce.	inconclusive
EX POR TARE	Cicero, *Against Verres*, 2.2.176	Cicero states that Verres exported a number of luxury items and the secretary at the harbour complained that no tax had been paid for them (*dico te … Syracusis exportasse*).	sea
	Cicero, *Against Verres*, 2.4.77	Some men from Lilybaeum carry away a statue of Diana that was in Segesta. People cry as the statue is being brought out of the town (*cum ex oppido exportabatur…*).	inconclusive
	Cicero, *For Flaccus*, 67	Rome used to export gold from Italy and the rest of the provinces into Jerusalem, but Flaccus made an edict forbidding its import from Asia, which Cicero approves of (*aurum … ex Italia et ex omnibus nostris provinciis Hierosolymam exportari soleret, Flaccus sanxit edicto ne ex Asia exportari liceret. … Exportari aurum non oportere …*)	sea (implicit)

Thence we are probably expected to understand that the employment of the verbs *importare / exportare* in the definition of the *Digest* is a tacit recognition of the fact that a *portus* is somewhere related to waterborne commerce in spite of the lack of explicit mention to a harbour on the sea or on a river. It will also be interesting to note, however, that the Latin language did not have synonyms to define this word as a specific anchorage place, in the same way, for example, as Modern English can define a 'port' as a 'town having a harbour'. We should also note especially that the closest noun to *portus*, i.e. *statio*, is precisely opposed to *portus* in the context of the *Digest* and other documents (see 4.10). For these reasons the sea or any other water body is not mentioned explicitly in the definition of the *Digest*.

The expression *conclusus locus* is somewhat more troublesome. What does it mean for a *portus* to be *conclusus* / 'enclosed'? One wonders if the *Digest* means to say that the *portus* is somewhere *sheltered*, for example in a natural bay or with human-arranged infrastructure, the paradigmatic cases being the Trajanic basin at Portus and the so-called Cothon at Carthage. This, however, does not seem to always be the case, as described below. The expression *conclusus locus* in this context could perhaps mean something more like a 'precinct' in the sense of a 'designated place', as opposed to somewhere casual, informal or even a black market. Bear in mind that the *Digest* is a compilation of law, and as such, the *portus* would only exist for the jurists as an official place with legal rights. In this way, *conclusus* might be employed in the same sense as an ἐμπόριον/emporion proper, referring originally to the restricted space where the trade deals were performed, which is still ambiguous in regards to whether the trade was carried out by sea or by land. However, to my knowledge, *portus* is never used when there are no waterways at all (including lakes and rivers), so perhaps the waterborne connection is just taken for granted, as explained above, and because the objective of this particular passage of the *Digest* is to define *statio* in opposition to *portus*.

Be as it may, a *portus* is certainly a place related to a navigable water basin: a sea, a river, a lake.

4.9.4 Features of a *portus*
4.9.4.1 Morphology
An idealised form of *portus* is described in Virgil's *Aeneid*, 1.157-169. Although it is true that the place described may not be real but artistically distorted, the passage still offers a

valid example of what features are desirable for a *portus*. The passage describes a natural place in the shape of a double bay with an offshore island and reefs. The offshore island and the reefs contribute to the mitigation of the violent sea currents (hence the exaggeration at the end of the passage that the crew can keep the ship without securing it with anchors).

Even if this bay is represented in a poetic way, the reality is that the best ports are actually situated in bays, as these natural indentions in the land provided sufficient shelter for the ships to operate safely. Florus (1.11), for example, notes as good natural ports the bays formed by the capes of Caieta and Misenum-Baiae, in Italy. Mela points out two extraordinary bays in his geographical treatise, namely Lacydon, the port of Massalia (Mela, 2.77), and Gades (Mela, 3.4), and in fact, Mela (2.50) also refers to the Saronic Gulf as if the whole of it was a port. Livy, too, praises the bay of New Carthage for the advantages it offers as a military port (Livy, 26.42). Pliny, too, in his list of towns between Cape Malea and the bay of Nauplia, points out those cities (and therefore their harbours) that are situated in small bays: Epidauros Limera, Zarax and a smaller port called Cyphas (Pliny, *NH*, 4.17). [282]

An example a contrario corroborating Virgil's ideal *portus* is provided in a metaphor by Cicero, *For Tullius*, 33. In that text, Cicero, who is defending his client Marcus Tullius, accuses the other contending party of having weak and invalid arguments for their case, and the image he uses to illustrate that the rival party "use reefs and rocks instead of a *portus* and a *statio*".

4.9.4.2 Multiplicity of basins

Virgil's text describes how the port is shaped into a double basin by the presence of an island. Other times, multiple basins in the same port occur because the coastal relief forms several bays close together. This is the case, for example, of the Piraeus peninsula, seen as one single entity by Cornelius Nepos, *Life of Themistocles*, 6.1. Incidentally, in that passage he describes the nearby bay of Phaleron as 'neither large nor good', thus proving that not all bays were capable of accommodating a port.[283] Another example of multiple basins formed by the natural relief of the coast is found in Vitruvius's description of

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[282] The first town in the list, Boea, is in fact on the other side of the cape.
[283] Cf. Pomponius Mela (2.76), where the author suggests that the lack of ports entails a lack of towns. In other words, it is not worth building a town in a coast that is too dangerous to be used as a port.

Halicarnassus (2.8.13), noting that the second basin, the so-called "secret port" was destined to military usage.

4.9.4.3 Offshore islands

Many texts report about offshore islands. The recurrent ones in the literature are Pharos, at Alexandria, and the offshore islets at Brundisium. Naturally, Pharos is praised for the port it forms and for the lighthouse, whereas Brundisium usually appears in the context of war, with most texts relating the battles of Caesar against Pompey. See, for example, Caesar, *Civil War*, 3.23 and 3.112. More emphatically, Pliny, *Natural History,* 3.151 explains how the port of Brundisium is formed by its offshore islands.

These offshore islands were taken as a natural advantage by the inhabitants of port communities. The texts quoted above recount how Pharos forms a narrow passage into the port. Although it is not noted explicitly in the literature, Pharos, together with the Heptastadion, marked the separation between Alexandria's twin basins (the Eunostos and the Great Harbour). This created two calm basins instead of one, and also studies have shown that the presence of the Heptastadion helped shelter the ports against sedimentation brought by sea currents.

Other islands would protect the port against the winds, like the one at the port of New Carthage described by Livy above (26.42). The literature also shows that artificial islands could be purpose-built to act as breakwaters (Pliny the Younger, *Letters*, 6.31). Other natural elements, like reefs or tongues of land, could also perform the same function of creating basins and sheltering the port (cf. Caesar, *Civil War*, 3.40).

4.9.4.4 Cliffs and mountains

Cliffs and mountains in the background are other natural elements sheltering the ports. Several texts hint at how advantage is taken from the shelter offered by cliffs and mountain ranges. The passages are not very explicit, but see for example, Florus 1.11 (cf. above), Pomponius Mela, 1.80; Livy, 44.28 and 45.6; and Pliny, *Natural History,* 6.110 and 6.150.

By contrast, while cliffs are usually perceived as an element of protection, as in Livy, 29.27, they could also represent a risk when the enemy is lurking or when contrary winds arise, as the same Livy also narrates (37.27).

4.9.4.5 Closed basins accessible through a "mouth" or through a channel

Until now we have seen one modality of ports: maritime ports directly on the sea, in a somewhat open bay sheltered by elements of the landscape. There is, however, another format, namely ports with closed basins, either because they are in a very closed bay or because they are only accessible through an access channel. This is the case, for example, of Ephesus or Trajan's basin at Portus, and in a similar way also of the port of Massalia, as it was situated in a very well enclosed bay, Lacydon.

These ports, however, suffered from one important challenge: blockage by siltation. Ephesus and Portus, as well as Ostia, are nowadays inland sites as a result of the sediments brought down by the rivers Kaikos and Tiber respectively. In fact, Ephesus was the object of constant maintenance operations in antiquity, as reported by Livy (37.14) and Tacitus (*Annals*, 16.23). Modern research shows (Steskal, 2014; Stock et al., 2016) how the port of Ephesus "moved" due to the sedimentation from being maritime to becoming landlocked. Pliny, *Natural History*, 2.201 also reports of this issue although he is mistaken to say it was due to the retreat of the sea, rather than to the sediments of the river.

As for Massalia, there are reports from antiquity that its basin was very easy to block due to its bay being so closed. Clearly this was undertaken for military reasons, as reported for example by Caesar, *Civil War*, 2.22, rather than occurring on account of fluvial sediments. In fact, the present-day basin in Marseille is still active. Closed basins could also be used for the contrary, to barricade onself, as reported in a letter from Cassius Parmensis to Cicero (Cicero, *Letters to his friends,* 1.9.21).

4.9.4.6 Non-maritime ports or ports conjoining non-maritime water bodies

Other ports are known to have been located at the mouths of rivers (Arnaud, 2016). Several examples can be found in Pliny's *Natural History*:

Pliny, *NH*, §	Water bodies
3.119-121	Ports on the branches of the river Po
3.126	Rieti, a river and a port
3.151	The tidal river Asana, notable for its port

6.86	The river running through the town of Palaesimundus (in Ceylon) has a harbour at the end.

Fluvial ports also include those cases where the main city lies inland, such as Rome and Arelate (Arles). Rome made use of Ostia and Portus on the sea, but also arranged harbour infrastructure on the Tiber inside Rome so that merchandise from the sea could be transshipped and sent upstream for storage and consumption in the capital. Livy, 40.51, documents the fluvial port in Rome. Likewise maritime ports can be made established in lagoons, or by conjoining lakes with the sea. The most famous case is certainly that of the lakes Lucrinus and Avernus, reported by Suetonius, *Augustus*, 16; cf. also Florus, *Epitome*, 2.18. A similar case is reported by Vitruvius, 1.4.12. The author narrates that the Salpians moved their city because it was insalubrious, then they connected the lake where they used to dwell with the sea, thus making it into an excellent closed harbour. Apart from conjoining lakes to the sea, closed harbours could also be formed by excavating the basins on the land or throwing moles to form an enclosure, such as the Trajanic basin at Portus in Rome and Caesarea Maritima in Israel.[284]

4.9.4.7 Interaction with the climate: storms and winds

Latin textual sources also emphasise the protection offered by ports in the case of two specific climatic events: winds and storms. Ports were indeed designed to provide shelter against such meteorological phenomena. However, the impossibility of creating a perfect harbour resulted in the sources documenting the hazards caused by the sudden rise of adverse weather.

Storms:

Adding to the concept of a perfect *portus* being primarily a shelter, a couple of passages in Livy (30.24 and 30.39) suggest that when a storm arises, ships will try to make for the nearest port and stay there. This seems a logical move. In fact, in modern times, sailors would also try to make for the port in case of storm if they know there is one nearby. However, it should also be noted that not even the space of ports was entirely safe. Prove

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[284] For bibliography on the archaeology of Portus, see the works by S. Keay listed in the bibliography. For Caesarea Maritima see Raban and Holum, 1996, esp. pp. 3-101.

of this are the numerous shipwrecks that have been found within harbour basins.[285] A couple of literary documents also illustrate this situation, such as Tacitus, *Annals*, 15.18, and Pliny, *Natural History*, 9.5.14-15.

The literature indicates that ships will try to stay in the harbour when storms arise. An extreme case of this is found in the *Bellum Africum*, 98, which reports that ships were detained at Cagliari for almost a month due to adverse weather. Indeed, leaving the port during a storm could have very serious consequences, as recorded by Pliny the Younger's *Panegyric*, 34-35, on Trajan's banishment of the *delatores*. That text illustrates how the traitors made a desperate attempt to escape, so they put to sea despite the storm and many ships ended up being wrecked against the reefs. Although the picture in that text may suffer from rhetoric exaggeration, it is credible that if one puts to sea during a storm, the ship may well be sent adrift by the violent currents, and such a temerity may result very possibly in shipwreck.

Winds:

The passages mentioning winds in relation to harbours and navigation are few and belong to a military context. They explain how too much or too little wind can hinder the voyage (in this case, the transport of troops from one place to another), or how a timely gale can be beneficial to enter the port in the right moment. Livy, 28.17-18 is highly illustrative of this issues.

Winds in the Mediterranean are quite variable, and knowing them is a military advantage as strategic as knowing the coast and the sea currents, given the reliance of ancient ships on the sails (Whitewright, 2008). Livy explicitly acknowledges this fact in 36.43, specifically speaking about Delos. Figure 28 shows the wind report from the nearest weather station to Delos, situated in the island of Mykonos, from the 10th to the 15th of January 2017:

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[285] For a database on the shipwrecks of the Mediterranean, see: http://oxrep.classics.ox.ac.uk/databases/shipwrecks_database/. However, to my knowledge, there is no specific research on what were the places with the greater risk of shipwreck. Therefore, it is difficult to tell if in case of a storm it was more dangerous to be at the sea or inside the harbour. Or simply we find the wrecks near the coast because they are easier to access than those in the high seas. Yet the point above still stands: harbours, however good a shelter they provided, were still risky in regards to shipwreck.

Tuesday, Jan 10

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	9	12	13	20	20	22	18	15
Wind gusts (max kts)	9	12	13	21	21	25	21	18
Precipitation (mm/3h)		1	3	3	4			
Air temperature (°C)	8	8	7	8	8	7	8	9
Air pressure (hPa)	995	990	989	989	990	994	996	999

Wednesday, Jan 11

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	13	13	18	23	22	21	22	22
Wind gusts (max kts)	15	16	21	27	26	26	27	29
Air temperature (°C)	9	11	11	12	13	13	13	13
Air pressure (hPa)	1001	1002	1003	1005	1004	1005	1005	1005

Thursday, Jan 12

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	26	26	26	15	15	15	12	7
Wind gusts (max kts)	32	32	30	16	15	15	12	7
Precipitation (mm/3h)	1		3	3	3			
Air temperature (°C)	13	13	13	11	10	10	10	10
Air pressure (hPa)	1006	1004	1005	1007	1007	1008	1009	1009

Friday, Jan 13

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	4	3	2	5	11	11	13	16
Wind gusts (max kts)	4	3	3	6	12	12	15	20
Air temperature (°C)	10	10	10	10	11	12	12	12
Air pressure (hPa)	1009	1008	1007	1006	1004	1002	1001	1000

Saturday, Jan 14

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	17	18	20	19	19	20	20	19
Wind gusts (max kts)	20	22	24	23	23	25	25	24
Precipitation (mm/3h)							0	1
Air temperature (°C)	12	13	13	13	13	13	13	13
Air pressure (hPa)	999	998	997	997	995	995	996	996

Sunday, Jan 15

Local time	02h	05h	08h	11h	14h	17h	20h	23h
Wind speed (kts)	18	12	13	11	8	9	13	22
Wind gusts (max kts)	21	12	13	11	8	9	15	28
Precipitation (mm/3h)	5						2	3
Air temperature (°C)	13	12	11	11	11	11	11	13
Air pressure (hPa)	996	998	1000	1001	1001	1000	999	997

Figure 28. wind report for Mykonos, from the 10th to the 15th January 2017

Caesar, *Civil War*, 3.25-27 is highly illustrative of the randomness of the winds. While it was a felicitous coincidence that the wind was blowing favourably for the Romans, first from the south and then from the south-west, the following statement is worthy of attention: *portus ab Africo tegebatur, ab austro non erat tutus*; "this port protects from the south-west wind, but not from the south". This is one rare case where we are informed of the shelter offered by ports from specific winds, and it should be noted that no ports are perfect shelters. While sites may offer very good protection against one type of more or less

prevailing wind, the high variability in the Mediterranean, as seen in the example above, causes that ports are vulnerable to other types of gales.

The irregularity of winds also results in ships not always steering themselves to the destination that they had wished for. Tacitus, *Histories*, 3.42 hints at this problem. In this text we are told that Valens was aiming to seize ships in the Gallia Narbonensis. He departed from Pisa, but due to adverse climatic conditions was only able to reach the port of Hercules Monoecus, present-day Monaco. Due to the negativity of the adjectives, the passage suggests that putting in at Monaco is a problem, but does not explain why. We may reasonably think, though, that if Valens intended to seize warships, they would have been those of the Classis Fluminis Rhodani, stationed at Arles, with a possible detachment at Marseille.[286] Both locations are west of Monaco. Therefore, Tacitus implies that Valens was unable to sail that far due to the state of the sea or to contrary winds.[287]

4.9.4.8 Building the ports

Ports were never fully natural structures: most were created or enhanced with facilities for berthing and for the human activities associated with water transport, not to mention that some ports were fully excavated (Portus, Caesarea Maritima). Cicero stresses this human efforts of construction in *De officiis*, 14. I shall now present the literary data on the subject of port buildings. A word of warning first, though: the texts that do mention data on built infrastructure are not at all detailed, even if the importance of ports was capital, and possessing one resulted in a major advantage and profits for the city. Vitruvius, in fact, states (1.5.1) that when a new town is built, it has to include a port where possible. In the same sense, Hyginius Gromaticus, a land-surveyor of Trajanic age, (*Constitutio Limitum*, 144-145) notes that colonies are placed at certain locations thanks to the presence of a port.

While Vitruvius notes that ports are public buildings (1.3.1), we have a number of texts noting construction or maintenance operations undertaken in the name of the emperors. These texts include: Pliny, *Natural History*, 36.125, where the port of Rome is regarded as a technical achievement; Suetonius, *Nero,* 9 who created a colony with a port at Antium; or *Historia Augusta*, *Antoninus Pius*, 8.3 documenting restoration works at Caietae and Tarracina performed at the orders of this emperor. Arguably, undertaking such public

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[286] Despite my best efforts, the only information I have been able to find on this particular *classis* is Bonnard, 1913, pp. 220-221.
[287] I thank Dr Leif Isaksen for this observation.

works may well have been a prerogative of the emperor, or imperial authorisation might be needed, possibly due to the sheer cost of the works. In this sense, Tacitus, *Annals*, 16.23, when documenting the process against Soranus, notes that the excuse for prosecute him for a majesty crime was that he had the access channel at the port of Ephesus re-opened. As with any benefaction works, the emperor was entitled to give his name to the structures that he had funded, as recorded by the letter 6.31 of Pliny the Younger concerning the construction of Centumcellae[288].

A note on limitations before opening the discussion on harbour installations. When texts mention structures, many times it is difficult to discern if these are inside or just near the harbour, and also whether they should be considered part of the harbour or not. For example, Virgil, *Aeneid*, 4.86-89 narrates the interruption of the construction works at Carthage. It mentions towers, the port, ramparts and walls. But what are these towers? Are they all watch-towers? Or could they – at least a few – have been beacons? And if they were watch-towers, are they to be considered a part of the port, or just within the normal defences of the city, as the city would have had towers not only overlooking the sea, but also the inland-side? The same is true for the walls. There is evidence that the port at Carthage was walled (Lancel, 1995-1997 : 172-192), but what about other sites where we do not have sufficient material evidence?[289]

4.9.4.9 *Ports, trade and wealth*

Vitruvius, 1.7.1 clearly states that, if a city is by the sea, the forum has to be near the port. The port being the business centre of the city, this is a very sensible choice. In fact, it was shown above that the possibility of a port is a motive for establishing a colony. Similarly, Pomponius Mela, 2.76 shows that where ports are rare, cities are also rare. In the same sense, having a port is both useful for commerce and for communications overseas. In this way, Tacitus states that some Irish ports are only known through trade, therefore ports act as gateways inwards and outwards of the Roman Empire. Trade relations were so influential in society that some trade nations, like the Carthaginians, even won themselves racist clichés for being liars and deceivers (cf. Cicero, *On the Agrarian Law*, 2.95). In fact,

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[288] For imperial buildings: MacMullen (1959) and Mitchell (1987).

[289] In the specific case of Carthage, another issue arises about where exactly the ships moored. The inner harbour, enclosed within the city walls, gradually lost its depth and became unusable. Thus, eventually, ships would have had to moor outside it, along the coast. When this happened, or how, or if *all* the ships did moor outside is still unclear. In fact, the basins were cut through in recent times in order to refill them with sea-water.

the harbour made Carthage so rich that Cicero, *On the Agrarian Law*, 2.87, justifies the destruction of the city because of this. The richness generated by the activities in the harbours is also exaggerated by Florus, *Epitome*, 1.13 when he writes that the port at Syracuse was made of marble. Sadly, we have very little indication in the literary sources of what products were traded throughout the Mediterranean shores.

4.9.4.10 Infrastructure and facilities

So far, natural harbour morphology as well as the capacity to build ports and control them has been discussed. But while the harbour may be constituted of a natural land formation or an excavated one, a number of infrastructure is necessary for it to act as a port proper and not just a point of anchorage. Yet a catalogue of such structures is not to be found in the literary sources, and when such structures are mentioned, it is usually difficult to separate those belonging to the port proper from those related to the city.

Texts relating to the defensive walls are a paradigmatic case. For example, Tacitus, *Annals*, 3.1, mentions that Agrippina arrived at Brundisium after the death of her husband Germanicus and people gathered to see her "not only in the port, but also in the walls and on the roofs". In this case it seems pretty clear that the walls were for the protection of the city and did not include the port, as also known from the archaeological studies on site.[290] Similarly, Cicero, *Against Verres*, 2.4.3, mentions that Messina is a city "ornated by its location, its walls and its port". Again, the text seems to state that the walls did not include the port. Nevertheless, we do have documentation, both literary and archaeological, of walls that did include the harbour of the city. The best known case is Piraeus (e.g. Florus, *Epitome*, 1.40), but other major cities are known to have their harbours inside protective walls, as also documented by Curtius Rufus, 4.4.9 (Tyre).

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[290] D. Vitale, from the Gruppo di Archeologia di Brindisi, confirmed the location of the Brindisian walls to me on a personal communication. Summarising, Brindisi lacks archaeological excavations to establish the full perimeter of the walls. Documentation provided by sporadic digs has allowed to identify reasonably well the location of the walls on the side of the sea, and the port was situated with certainty outside of the walled precinct. The protection of the port, Vitale suggests, was probably achieved by the effective presence of the Roman army, and in particular by means of patrolling lighters in order to control or prevent the ships sailing into or outside of the harbour (cf. the reports of Caesar's siege of the city in 49 BC). The issue with the Brundisian walls is on the land side, as there is little data. Incidentally, there exists the generally accepted hypothesis that the walls simply protected the hill to the western side, or else the land side walls were on the same side as the Medieval walls, which are still visible nowadays, but either way the inland precinct is not relevant for this discussion.

Other cases of city buildings related to port complexes, but not employed for nautical matters, include the forum (Vitruvius, 2.8.11, speaking about Halicarnassus) or the theatre (Florus, *Epitome*, 1.13, on Tarentum). Other defensive structures in the port are mentioned only anecdotally in the Latin sources. An example of this is the armoury in Piraeus, which appears in Vitruvius, 7.prologue.12, when the author mentions the existence of a book (nowadays lost) on that particular installation. The lack of literature on defensive elements is surprising given the clear bias of the Latin literature towards military matters, but again, the historical chronicles focus on the facts, rather than on the elements of the landscape.

A similar case is that of the *navalia* (shipsheds, or possibly dry docks). They only appear in accidental mentions, and especially in the Caesarean corpus (*Civil War*, 2.22 and 3.111-112). Similarly, Livy, 25.23 reports of a tower in the port of Trogilus only to say that it was picked for the ransom of a hostage. The mention of the tower is incidental and does not specify the normal function of the building: was it an actual prison? A watch-tower? The office of the guards? A lighthouse? Indeed, the most usual function for a tower at a port was to act as a lighthouse, but it is not the only one. For example, it is also documented that customs houses may also have been located inside towers. The literary sources, and in particular the Latin ones, are in no way rich in their documentation of lighthouses, with the monument at Pharos being practically the only representative of such structures (e.g. Pliny, *Natural History*, 36.83).[291]

The Latin literary texts are indeed extremely limited in regards to the details provided on the maritime infrastructure at harbours. At the same time, though, a few textual fragments indicate that ports were carefully planned inasmuch as they were elements of public infrastructure. A clear example is a navigable canal project reported by Pliny, *Natural History*, 6.165, or the discussion in Cicero, *De officiis*, 2.60 about the moral need to spend money on public facilities like ports. Ad hoc operations were undertaken if the context required so, such as the excavation of a new access channel at Carthage in order to escape a military blockade (Florus, *Epitome*, 1.31),[292] but at the time when a port or one of its

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[291] Hague (1973), esp. pp. 293-303. The forthcoming work by Jonatan Christiansen is also very much worth following.

[292] The word employed in that passage is in fact *portus*, but cf. Appian, *Lybica*, 577 ed. Gabba-Roos-Viereck; 18.122 ed. White.

elements was built, each procedure was fulfilled with careful planning, like the creation of a mole by the sinking of a ship reported in Pliny, *Natural History*, 36.70.

In fact, it was not just the harbour infrastructure that underwent careful planning, but means of communication in general. As ports were at the interface of contact between sea-borne and land-based traffic, it is perfectly reasonable to read that roads arrived down to the harbour's quays (Cicero, *Republic*, 3.43, on Syracuse), although other naval structures are mentioned only very rarely (e.g. Curtius Rufus, 4.5.20-21, where a barrier locking the access to the port and the piers are mentioned). Roads leading to the port are also mentioned in Caesar, *Civil War*, 1.27, for Brundisium. Those must have been no secondary roads if the army was expected to move through them (hence the traps dug in the roads by Pompey's men). It is natural that roads leading to ports would be widely functional, since ports were mostly the gateway for merchandise, from those main hubs foodstuffs and other materials needed to be transported and redistributed to the neighbouring hinterland.

Sources are very scarce in their details as to the human-built infrastructure and facilities that could be found in the port, such as the piers (*crepidines*). Although the importance of ports is acknowledged in a number of texts, and prove of this is the fact that they are used for political or military advantages, specific detail of the various amendments that the local populations had to build go silenced for the major part throughout the Latin literary sources. For data on the harbour structures, as well as for the staff working in the harbours, scholars would do better to look at the epigraphical sources rather than in the historical literature, which is the object of this thesis.

The quantity of *portus* on each site is an issue of lesser importance. Virgil, for example, employs the term in the plural in almost every occasion – and the plural is not always justified. The clearest example of that is the port of Velia, in Italy. That port features in the *Aeneid*, 6.365-366, where the ghost of Palinurus urges Aeneas to sail to that place. The Virgilian verse is in the plural (*portus Velinos*), but when Hyginius (quoted by Aulus Gellius 10.16) criticises the chronological incoherence, he refers to Velia as having only one port (*portum qui in eo loco est*). In antiquity, the acropolis of Velia was situated overlooking two small bays, one to the north and one to the south, which could provide natural harbours (but these bays have now been filled with the sedimentation brought down by the rivers Alento, Palistro, and Santa Barbara). The southern basin seems to provide better shelter for the port and it may have been the main site. Geophysical

prospecting has also uncovered some artificial structures in that basin dating possibly to the 5th century BC. Those would have contributed to the maintenance of the port against the silting.[293] Therefore, while Virgil may have known about the two distinct bays, Hyginius probably only knew of the existence of a single port on the site, or he understood both basins to be a single entity.

More puzzling is the case posed by Cicero, *Against Verres*, 2.5.50: Verres was bribed into breaking treaties. One of the treaties stated that he could not request a ship from Tauromenium, whereas the other solemnly said that, if he were to request a ship from Messina, Messina had to furnish a ship that could even sail to the Atlantic Ocean if requested. Verres, however, requested a ship from Tauromenium. Cicero says that this is because he was bribed so that Messina did not have to furnish ships or even patrol the waters of the strait in front of them. Cicero states that the situation was such that the people from Messina would not have to defend their walls or their ports (*ne sua moenia portusque defenderent*). The issue is that Messina only seems to have had one harbour basin. In fact, Messina's foundational name was Zankle (it was later changed to Messana / Messina by the tyrant Anaxilas), derived from the word in the local Sicel dialect meaning 'sickle', alluding to the arched shape of the port basin (Figure 29, Figure 30). Some of the first coins issued by this town were in fact stamped with the sickle-port and a doplhin inside, thus denoting the essential role played by the port in its economy.[294] At least during the time of the Punic Wars, Messina had, however, a whole system of satellite towns on either side of the strait, but this does not seem to be what Cicero is referring to out of his context. It could be simply that the plural is used for prosodical reasons: Cicero tends to adorn his discourses with poetical traits, and *portus* is usually employed in the plural in poetry regardless of the reality on land. By way of example, almost all of the Virgilian port quotes collected for this thesis employ the term in the plural.

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[293] For the port of Velia, Cerchiai et al. (2004), pp. 84-85.

[294] For further details on Zankle / Messina, Cerchiai et al. (2004) pp. 174-176. Please note that the map on p. 176 is captioned as Zankle but, in fact, it seems to correspond to Milazzo instead.
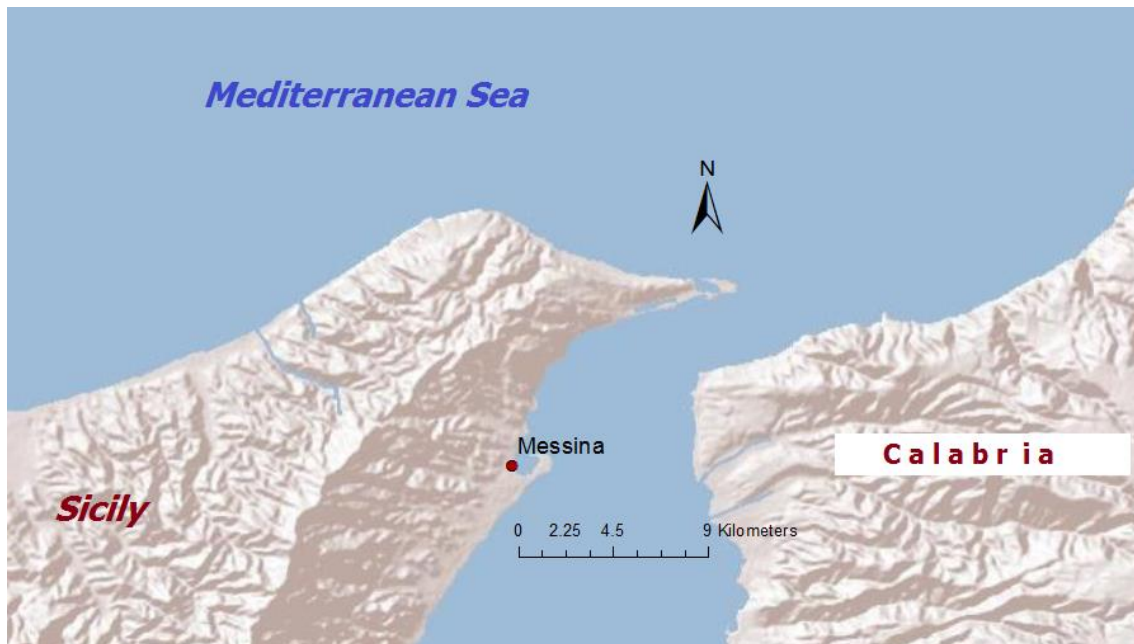
Figure 29. location of Messina, with its sickle-shaped port

Silver coin from Messana, marked with the ancient, local name Dankle. Obverse: sickle-shaped harbour with dolphin leaping left, dotted border; reverse: square divided into nine sections with scallop shell in the centre. Source: British Museum online collection. Catalogue number: G.2829

Figure 30. Messanian coin representing the harbour. Source: http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=3315607&partId=1, consulted 23rd June 2017

4.9.4.11 Ports in the political and military sphere

While ports were essentially commercial hubs, some sources emphasise the strategic political and military importance of the ports. A number of sources show how ports become items of negotiation for military alliances and peace treatise terms: e.g. Livy, 24.1.13 (detailing the conditions of a peace treaty) or 35.39, where Villius and his men are accepted as allies by the Magnetes people as long as they don't enter the harbour. Similarly, Caesar, *Civil War*, 3.102 narrates how the Rhodians did not let the supporters of Pompey into their harbour as Caesar was winning the war. Thus, even if Rhodes was a priori neutral, they decided for their own safety to take the part of one of the contending parties, and that meant to prevent the other party from accessing their shelter and resources, of which the port was probably the most important one. In a similar way, Caesar, Civil War, 1.31 shows how ports can be used as political weapons themselves by preventing the enemies to land on them. In this particular passage, it is reported that Tubero is barred from Utica despite his son being sick (i.e. he needed to land there to see a doctor). With this anecdote, Caesar is showing the cruelty of war in order to put the readership on his side, but it is still true that ships would need to land at ports to replenish their supplies of food and fresh water, as well as for other commodities, and preventing the enemy from doing so would certainly put them into a troublesome situation. Also on the political sphere, Livy, 39.26 recounts that Philip was accused of neglecting some ports in the benefit of others. Although Philip rejects the accusation justifying that he cannot control what ports merchants choose, certainly the available facilities and the public infrastructure and funding would have played an important role.

A difficult issue is who is in control of the ports so as to decide their usage or fate. *Historia Augusta*, *Maximini duo*, 23.2 mentions the Senate. Livy (28.17-18) speaks of a royal harbour. Cicero, *On Pompey's Command*, 33 refers to the regional praetor, and similarly Caesar, *Civil War*, 1.35 refers to the local government of Massalia (which the author names "senate" for the understanding of his Roman audience).[295] Finally, Livy, 25.30 points to the authority of an army prefect carrying out operations in the port of Syracuse. None of these ranks is harbour-specific, but they are all the local, regional and imperial / territorial

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[295] Note that in this passage *portibus* is in the plural. This is difficult to explain as Massalia only has one single enclosed basin. However, there are some offshore islands in Marseille that may also have been used as anchorages, and perhaps there might have been anchoring points in the rest of the bay, outside the city's enclosed basin. This could explain why *portibus* is in the plural. For Marseille's archaeological studies, Hermary, Hesnard and Tréziny (1999) and Rothé and Tréziny (2005).

bodies of government, or military in the context of war. Therefore, the Latin literary sources consulted do not document a specific authority in charge of the port.[296]

In relation to the specific workers of the port, the Latin sources are extremely scanty. In fact, there is only abundant reference to the tax collectors (Cicero, *Against Verres*, 2.2.171, 2.2.176 and 2.2.182; *On Pompey's Command*, 15; cf. Pliny, *Natural History*, 5.124). There is also a generic mention of the body of slaves a contrario in Tacitus, *Agricola*, 31, where the author explains that Britain has no harbours for slaves to work in, without further specification of what jobs slaves perform in the Roman ports that are absent from Britain. One more source (Livy, 40.4.11) reports of police-like guards in the port, but note that the context of the action is Greek. No other workers, such as the *nauicularii*, the *codicarii* or the *urinatores*, are mentioned in the literature consulted for this thesis. This, though, only proves the lack of consideration for everyday activities in the historical chronicles and the technical treatises. Some of these harbour employees do receive attention in the legal sources, most notably Justinian's *Digest*, which is too complex a compilation for the purposes of this thesis. However, if one wanted to make a catalogue of the workers at the port, one had better examine the epigraphic sources rather than the literature (cf. Bonnard, 1913).

Due to the nature of the Latin sources, our evidence is strongly biased towards the military aspects (Figure 31):

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[296] Certainly, it would be interesting to contrast this lack of a specific port authority in the Latin literature with the Latin epigraphical sources, as well as with the Greek sources in general (I am thinking especially of the Greek authority by the name of *Limenarchai*). Further research is needed into the field, but it was not possible to undertake it during the short space of this thesis.

building and restoration	17	
Greek and Latin word relations	16	
infrastructure	31	
Latin terminology	20	
metaphorical use	17	
military context	199	
morphology	60	
politics and administration	26	
toponymy	83	
trade-related events	13	
weather	21	
miscellaneous	187	

NOTE: some texts tagged twice if more than one item was relevant
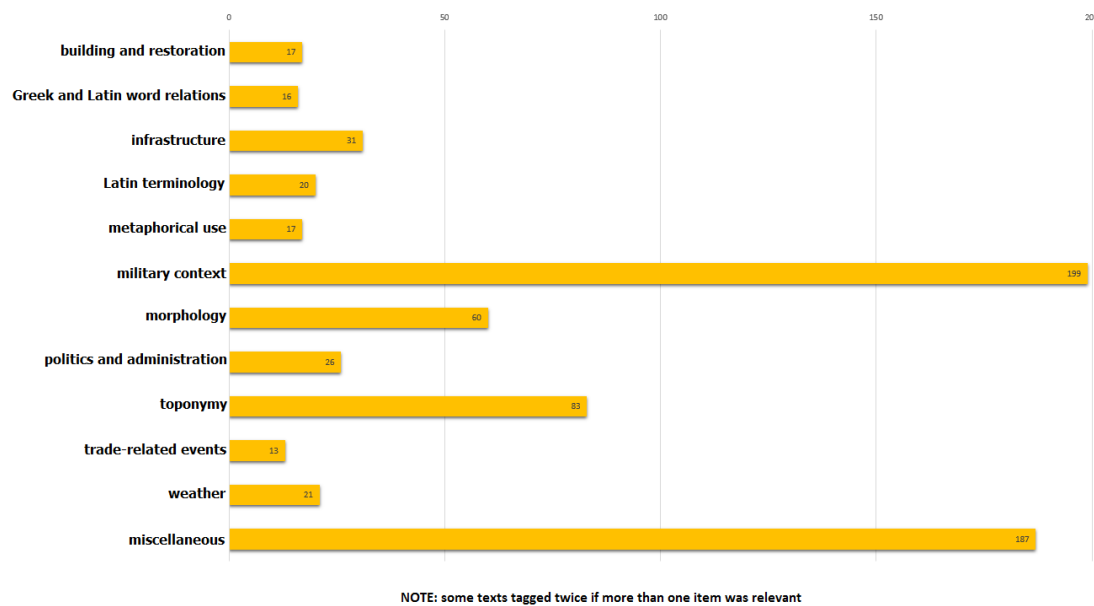
Figure 31. Topics covered by the Latin literary passages consulted for this thesis

Indeed, the purpose of most of the historical writings is to record wars, be it intentionally (as in the case of Caesar's field reports) or simply because those were the major events at the time (like those found in Livy's chronicles). For example, Livy, **35.12.14-17**, advocates for the key role played by ports in war contexts but offers no clues as to the physical characteristics of these places or of the anthropogenic infrastructure that militarised ports might have required in order to launch or support the navy. Livy's passage, for example, is little more than a quick comment of Dicaearchus the Aetolian telling King Antiochus that he can count on their infantry and their cavalry, their land strongholds and their ports. The passage goes on to say that thanks to all of these the Hellenistic kingdoms can take back what the Romans had previously conquered, which suggests that the ports played an essential role on warfare, but the passage does not name any specific ports. Therefore, it is impossible to verify with archaeological remains or in other textual sources what special features these ports offered – if any – for warfare purposes.

The vast majority of texts relate to the arrival of supplies for the army.[297] This is only further confirmation that transport of goods was most efficient if waterways were used, as noted elsewhere in this thesis, because larger quantities of products could be moved across longer distances. The necessity of keeping the army well fed and furnished with weapons

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[297] E.g. Livy, **22.22, 25.15, 25.31, 26.20, 28.37, 32.21, 32.33**, cf. also **31.45** where the Roman allies ravage the land so that the enemies do not have access to crops; Caesar, *Civil War*, 3.23; *Bellum Africum*, 21 and 34.

and tools causes that, prior to an invasion, the Romans sent ships to explore the maritime accesses to the territory in order to back up their army with cargoes. Explorations are documented in Caesar, *Gallic War*, 4.20-21 (cf. Suetonius, *the Deified Julius*, 58) and Tacitus, *Agricola*, 25. The same need for supplies results in camps being set by the ports, as reported by Livy, 25.26 and 27.15; similarly, 37.32 documents the wintering of ships after a war. Exploration and knowledge of the landscape are also necessary as the fleet will need a harbour that is large enough to retreat to during the periods when they are not fighting. The necessity for large basins is documented by Livy, 32.18 and 35.48.

Indeed, barely any texts effectively detail any structures in the port prepared for war. The chain for barring access to the harbour basin documented in Frontinus, *Stratagems*, 1.5.6 is one rare example not only of a harbour facility but also of this particular kind of facility. In another rare note on harbour constructions, Caesar, *Civil War*, 1.25 explains how he built a platform across the entrance of the port at Brundisium so he could shut it and his soldiers would have a safe surface on which to patrol. Ramparts, mantlets and war towers are also documented by Caesar, *Civil War*, 2.1, but it is not fully clear from that passage if those were built within the space of the harbour or simply around the city of Marseille, which was the target of the attack.

4.9.5 Further information to be found in ancient literature:
A number of texts emphasise that the port is a public space. While those sources are certainly interesting for the field of sociology, they are surplus for the aims of this study. For example, Plautus's plays usually depict the ports as a space for the people (e.g. *Menaechmi*, 2.2.65-72, mentioning prostitutes; or *Rudens*, 2.2 involving fishermen). Ports were effectively a human space, and they were, at a more domestic level, a way for personal communications. Such a use is documented in many of Cicero's letters, but more especially, in his *Letter to his friends*, 16.5.2, telling his slave friend Tiro that he can have someone waiting at the harbour every day for his letters, as they could not travel together due to Tiro's ill-health. Less importantly, Virgil, *Aeneid*, 5.114-285 depicts the port as a space for leisure when his heroes participate in a boat race.

The port is equally outlined as a space for public viewing in that there were many works of art present within it. Pliny, *Natural History*, 34.74 and 35.140 documents pictures

placed in the harbour areas to be admired by travellers and the general public. Latin texts do not generally document the presence of inscriptions, but these obviously fall into the same category. For the same purpose, Cicero, *Against Verres*, 2.4.26 reports of a crucifixion that took place in the port as that was a very public space where Verres could make an example for both the local population and the passers-by.

Finally, Pliny, *Natural History*, 9.50-51 provides information about fishing strategies in Byzantium.[298] It does, however, not name any facilities built to this purpose, and therefore the passage does not amplify our knowledge of the characteristics of Roman ports.

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[298] Abundance of fish in the harbours at Byzantium is also documented by Tacitus, *Annals*, 12.63.

4.10 STATIO

4.10.1 Introduction

Owing to the referential variety indicated in 3.6.1, together with the fact that the instances where a *statio* is unequivocally a port are rather few, the research on this term has proved to be complex.

4.10.2 An etymological note

Statio is a deverbal noun related to *stare*. *Stare* belongs to the same Indo-European root as English *stand*, German *stehen* or ancient Greek ἵστημι. The main idea conveyed by this verb is the same as in modern English: 'to stand, to be on your feet, to be in a vertical position'. From this starting point, the *statio* becomes the 'place where someone or something stays', including the way the ships stay on place in the water when they anchor or when they moor at the harbour, and by methatesis, the *statio* becomes a type of harbour.

4.10.3 Ancient definitions of *statio*

Justinian's *Digest* and Servius, a commentator of Virgil, provide definitions for *statio*, albeit of later date. Justinian quoting Ulpian in the *Digest* (43.12.1.pr), and Servius in his *Commentary to Virgil's Aeneid* (10.297 and 2.23), as well as Isidore of Seville (14.39), define the *statio* as a temporary port, where ships can stay for a period of time but not winter.

Interestingly, Servius 2.23 notes that a *statio* is what "nowadays is called a *plagia*", thus providing an important clue as to the vocabulary use in later Latin, although this word also appears in the *Itinerarium Maritimum* (possibly 1[st] century AD). More remarkably, Servius 10.297 explains that a *statio* is in no way a dry beach (*siccum litus*), because this word refers more to the land (cf. below). This would also verify the hypothesis that the *statio* is where the ships "stay put" on the water.

The *Digest*, 50.16.1.pr (Ulpian), opposes *portus* to *statio* in that the *portus* refers to the commercial space whereas the *statio* is fortified. While it is true that some ports were fortified, it seems likely that there is a confusion in this passage between the *statio*/anchorage and the *statio*/headquarters of the navy or armed guardpost.

4.10.4 General outline of the term *statio*

4.10.4.1 Caution: the military bias in the sources

Due to the nature of our evidence, most of the texts discussing *stationes* convey a military context. Since the evidence is heavily biased, one could easily reach the conclusion that the *statio* was a militarised space. Although it is true that ports referred to as *stationes* can and do get involved in war operations, it is necessary to exercise caution because it is not always self-evident from the war chronicles that *statio* refers to a port, rather than to the site of the armed outpost or the headquarters of the soldiers. For example, Livy, 28.46 states that Mago left some ships at Savo '*in statione ad praesidium*' (literally, 'at the station for protection'), to guard his booty. As in many other passages, the *statio* is used by an invader, thus entailing that they are militarising a harbour where there were no previous other military facilities, or at least, not those of the invader. However, the ships must have been performing some kind of guard duties on the port, and therefore floating on a more or less delimited space of water, in accordance with the *statio* meaning of staying on place.

4.10.4.2 The anchorage is temporary because the elements will not allow for long stays

The literary sources depict the *statio*-type anchorages as temporary and as poor quality, probably the short period of time being a consequence of the inadequate morphology. Although the text is somewhat mythical, temporariness can be seen in Pliny, *Natural History*, 3.82.3, where he says that a certain place received its name after the *statio navium* of Aeneas, which presumably sojourned there for a period of time.

Livy, 28.6 constitutes a particularly good example of the dangerousness of *stationes*, when the author states that it is not easy to find a worse station for the fleet than Chalcis, because this place is exposed to all sorts of winds and bad weather. The same Livy, 37.27, refers to a promontory ending abruptly in cliffs. This suggests that there will be no commodities directly on the shore (for example, inns), although that particular text of Livy is ambiguous in describing that particular *statio* as a space for war operations offshore, rather than an organised port.[299]

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[299] For other military literature on offshore *stationes*, cf. Livy, 24.27, who locates the statio at the entrance of the port of Syracuse; 37.9 reports that Livius arranged a statio "facing Abydos" (*contra Abydum*), while the statio in 25.27 is "facing Africa" (*versa in Africam*); finally, 24.11 recalls the formation of a fleet out of the ships that had their statio off the coast of Calabria.

The reason for an invading army to set up a *statio* is to keep guard on the land or to secure their supply chain. But while the navy might be expected to withdraw once the war is over, one passage suggests that if the situation became more permanent, infrastructure would be built to second this naval effort. Indeed, Livy, 30.9 reports that the Carthaginians intended to attack the *statio navium* of the Romans at Utica and perhaps also their *navalia castra*, i.e. the camp of the navy soldiers. Therefore, more permanent structures become added due to the prolonged use of the site.

4.10.4.3 Offshore anchorages? The confirmation of Nitriae

More importantly, the term *statio* is found outside a military context in Pliny, *Natural History*, 6.104.12. He clearly states that the *statio* is not good because it is offshore, and the goods need to be transshipped to and from the mainland. Upon reading this passage though, and especially taking into account that said *statio* is located near India, one has the strong impression that perhaps Pliny might have been adapting a source originally written in Greek. The Barrington Atlas places the *statio* mentioned by Pliny in the area of present-day Honavar, in India (BAtlas 5 C4). In the light of the comment on the difficulty for sailing due to lack of depth I, would accept Honavar as the correct location, or perhaps even slightly southern than that (perhaps the area of present-day Murdeshwar?), because on that place there is the submerged Chagos-Laccadive Ridge, which could pose problems for navigation.[300]

The shallowness of the area regarded by Pliny as a difficulty is understandable in relation to the ships.[301] The archaeological evidence from the Red Sea Ports indicates that ships were sailing the Indian Ocean within the Indo-Roman trade networks were built in a Mediterranean tradition, and rigged in a Mediterranean tradition. It is therefore reasonable to assume that they may have been of a similar size to those in the Mediterranean – with the very important caution note that these might only be the 'Roman' ships, and that the local ones were totally different. In that sense, the Kyrenia[302] is generally considered a standard ship model despite its early date between 325 to 315 B.C. This ship is about 15 m long by 5 m wide, and it has a draft of 1.5 m, therefore it is

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[300] On the ridge, also known as Chagos-Laccadive Plateau, see: http://geographic.org/geographic_names/name.php?uni=-237181&fid=6443&c=undersea_features (consulted: 1st June 2017). Cf. also Ramana et al. (2015).

[301] I thank Julian Whitewright and Peter Campbell for their kind explanations.

[302] For the Kyrenia wreck: Wylde Swiny and Katzev (1973); Steffy (1985); Katzev (2007); and http://nauticalarch.org/projects/kyrenia-shipwreck-excavation/.

estimated that the shallowest that it would be safe to go into is 2 m of water. Larger ships are also known, like the Madrague de Giens wreck, sunk around 75-60 BC. This ship is 40 m long, by 9 m wide by 4.5 m deep. Its draft is estimated between 3.5-3.7 m.[303] The submerged ridge could explain why it was difficult to sail on that area (Figure 32):
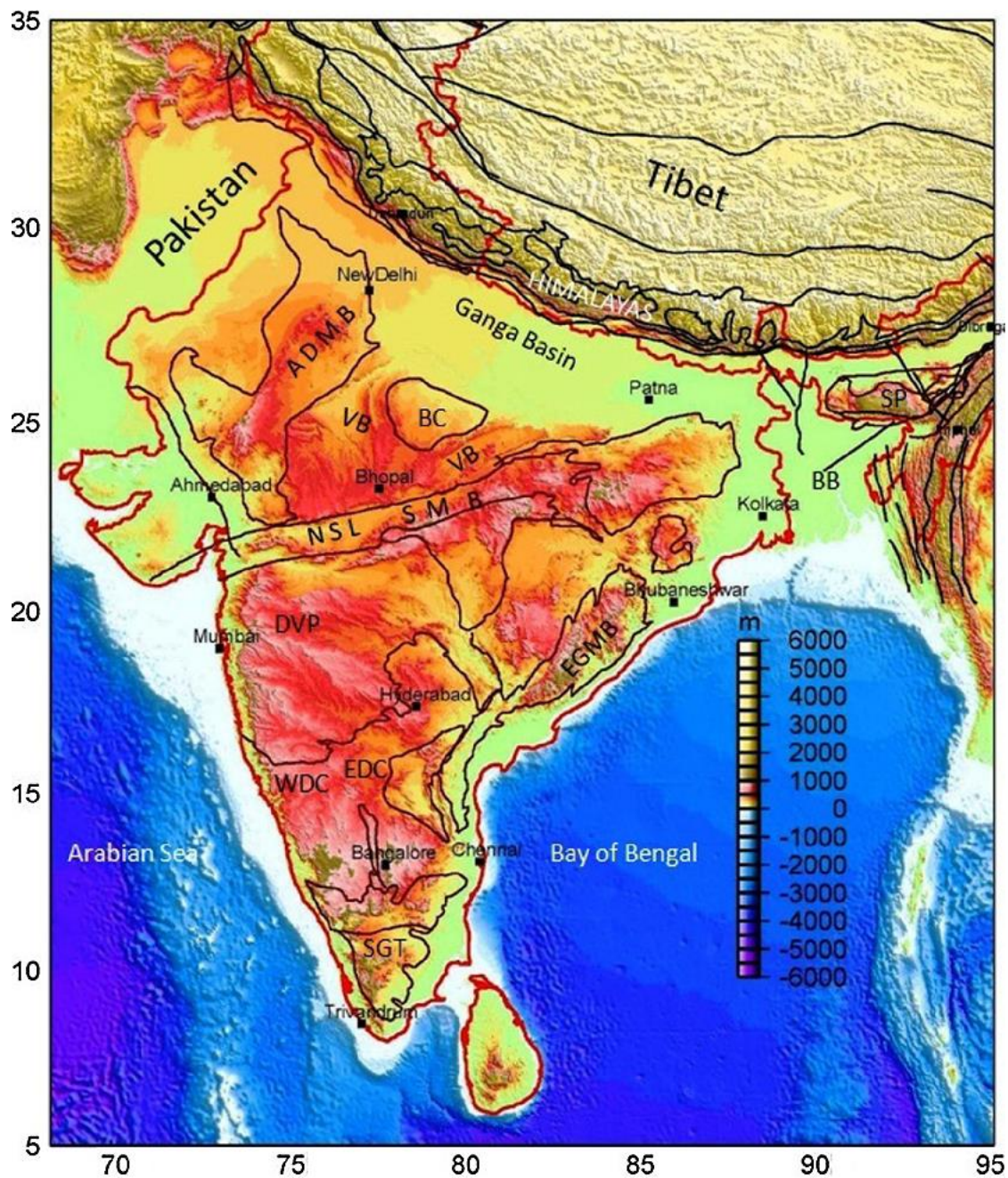
Figure 32. Topography of India. The white colour indicates areas of the sea around 0 m. Source: Tiwari et al. 2013, fig. 1.

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[303] For the dimensions and more details on the Madrague de Giens, Pomey (1982).

It is known that in some cases merchants had to anchor offshore and tranship due to lack of depth. Some harbours in Albania and Croatia are very shallow, and yet there is archaeological evidence for a large volume of traffic: could that be indicative of the *statio* as a place where large ships could anchor offshore and tranship?[304]

4.10.4.4 Good stationes?

A description in Virgil's *Georgics*, 4.418-422, runs contrary to the idea that *stationes* are poor quality anchorages. That *statio* is described as most sheltered (*tutissima*). It is located in a vast cave formed in a hollowed mountain side with favourable winds and currents. The space is shaped in different indentions (*sinus*). The text seems to suggest that there is a rocky reef for further protection from the impact of the sea, but this is less clear. However, this passage belongs to artistic literature and its value in relation to reality is not self-evident. It could be that Virgil was indeed referring to the ships staying floating on water, or else it could also be possible that he wrote *statio* because *portus* did not scan the verse.

There is a more interesting text using a similar expression, *stationem tutam*. Livy, 10.2 is puzzling in the sense that the *statio* is described as a remarkably good one, but it is situated at the mouth of the river.[305] It remains unclear why this site is referred to as *statio* and not *portus*, since it seems to be good quality and used more or less continuously. Perhaps it is because the ships only stopped there for a period of time, probably for commercial purposes, and did not winter in that place, their final destination being Padua up the river.

There is also a note in Festus's compilation that seems to relate the *stationes tutae* with ὅρμοι/hormoi. While this is very scanty evidence, it could be the case that a *statio* can be likened to a ὅρμος/hormos in that both would be anchorages of secondary quality in respect to the λιμήν/limen and the *portus*.

Another interesting parallel is with the *Maritime Itinerary*. This is a highly complex text which seems to consist of at least three different parts, the second of which notes the type of harbour forms. It differentiates two main modalities of port: the *portus* and the *positio*. The dating of this document is complex, but assuming the traditional attribution to the reign of Diocletian for the text in the state that we can read nowadays, it could well be that

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[304] Peter Campbell, on personal comment.
[305] Other texts relate *stationes* to rivers, but they can be explained simply as military guard posts that happen to be placed on waterways, like Suetonius, *Life of Tiberius*, 72.1 on the Tiber, and Tacitus, *Histories*, 4.26 along the Rhine.

what the Republican and Early-Imperial authors called *statio* was re-named *positio* in Late Antiquity. This change is plausible semantically (cf. modern English *station* and *position*). However, *positio* is not documented anywhere else in the Latin literature or, to my knowledge, in the Romance languages.

4.11 LITUS

4.11.1 An etymological note

According to Pokorny (1994³), *litus* derives from **leitos*, from an Indo-European root **lĕi-* meaning something in the lines of 'splash, flow, drip'. Among the many parallels adduced in the dictionary, the best match for the sense of *litus* is Welsh *lli* 'flood, sea'. The many other examples suggested do not seem to match the semantic sense of *litus*, such as the quotation of Lithuanian *lýti* 'rain, shower', but this root is certainly our best chance, unless new evidence would come to light. A relation with Latin *limus* 'mud' is not verifiable morphologically, although Walde (1938³) would like a semantic relationship in the sense of 'land' or 'wet earth'. He remarks in that aspect the Welsh name for Britanny, Llydaw, implicitly suggesting that the continent was seen as some sort of paradigmatic shore in respect to the British Isles.

Finally, Ernout and Meillet (1932) note that *litus* 'shore of the sea' is opposed to *ripa* 'shore of a river' and *ora* 'shore of a lake'. While it may have been so in origin, in my experience the distinction is not so strict in the period researched for this thesis. *Ora* in particular overlaps relatively frequently with *litus* in order to refer to the shore of the sea

4.11.2 Ancient definitions of *litus*:

Servius, *On Virgil's Aeneid*, 1.3 defines the *litus* simply as the land that is in contact with the sea. He also notes that in another passage, Virgil speaks about plowing the *litus*, although a *litus* is not normally plowed (cf. 4.212). The same Servius, *On Virgil's Aeneid*, 3.300 opposes the *litus* to the *portus*. Servius's comment to 4.257 depicts the *litus* as a sandy or a rocky place. Contrarily, later on, Servius[306] describes the *litus* as "green", but in this case it is the bank of a river.

The *Digest* only offers one definition of *litus* (50.16.96.pr.). Like Servius, for the *Digest* a *litus* is the point of contact between the land and the sea (literally, there where the currents

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[306] This is in the comment to verse 12.248, but with a by-quote of 8.83 (*viridique in litore…*).

wash). Justinian's compilation mentions the term *litus* many other times in different legislative contexts, but does not define it again. However, it is worth noting that the *litus* is considered a public place and no-one's property.[307] The *Digest* also discusses specific issues regarding property on the *litus*, e.g. can you take as yours the merchandise from a shipwreck?[308] Similarly, if you find gems, they are your property,[309] but can you build a house on the *litus*?[310] More interestingly, the *Digest*, 1.8.5.pr., does say that fishermen are allowed to build huts on the *litus*, thus noting that the *litus* is the place where fishermen can carry out their activities.

Isidore of Seville also defines the *litus* as the point of contact of the sea and the land, the beach, in his *Etymologies*, 14.41.

4.11.3 Information from other textual sources:

Livy, 44.28 provides a very good example of the fact that the *litus* is the place of contact between the land and the sea, as well as the place where the wreckage of ships eventually washes up (although in this case the wreckage includes horses that were able to swim to the shore). Several other texts mention explicitly that the *litus* is the place where ships have accidents and wreck:

- Caesar, *Gallic War*, 5.9-10, although notice that in this case Caesar was forced to anchor at a *litus* for lack of a port.[311]
- Tacitus, *Annals*, 14.6
- Tacitus, *Annals*, 14.39
- Livy, 30.24, where the wreck is due to bad weather.
- Curtius Rufus, 4.7.19 reports of a tribe dwelling in Syrtis, who makes a living by waiting for ships to wreck on the *litus* and then plunder them.
- A similar situation is reported in Frontinus, 3.16.5.

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[307] 1.8.2.pr., 50.16.12.pr., 18.1. 51.1, 39.1.1.18, 39.2.1. 24.pr, 47.10.13.7.
[308] 47.9.1.pr.
[309] 1.8.3.pr.
[310] 41.1.14.pr., but cf. throwing a mole at sea: 43.8.2.8.
[311] Cf. Caesar, *Gallic War*, 4.23, where the same situation is given that Caesar needs to anchor on a *litus* because there are no ports on the area. Similarly, *Civil War*, 3.14, Caesar's officer is advised not to sail, because he will not be able to disembark neither on the ports nor on the shores due to the heavy defenses of the enemy. In the same sense, Frontinus, *Stratagems*, 1.5.7, reports that the army disembarked at the *litus* because they were unable to access the port.

- Alternatively, it can happen that ships run aground on the *litus*, as in Livy, 22.19-20. The Carthaginian ships ran aground as they got trapped in a bottleneck at the mouth of the Ebro. Then the Romans approppriated themselves of the ships that were still usable by towing them into open waters.

However, the *litus* is not always referred to as the place where shipwrecks happen. Sometimes, disembarking on the *litus* would take place as a tactical move (e.g. Livy, 25.26, in order to cut the enemy line of reinforcements). It is also the place where ships can moor for a while in case of emergency, so that they do not go adrift or wreck. Livy, 28.36 describes one such situation, where ships drop their anchors and attach themselves with cables to the land. This text also makes use of a highly recurrent expression: *naves litori adpulsae*. With some grammatical variants (e.g. a simplificated use of the ablative case *litore* instead of the dative verb regime *litori*), this phrase reappears in a large number of texts, including: Caesar, *Civil War*, 2.43; Servius, *On Virgil's Aeneid*, 1.170; Valerius Maximus, 1.7.ext.3; Curtius Rufus, 3.18 and Tacitus, *Histories*, 4.84. A lexical variant is found in the *Bellum Alexandrinum*, 17 (*naves ad litora et vicum applicarunt*). The variant *naves ad litus appulsas* appears in Caesar, *Civil War*, 2.23, but in that passage the text suggests that the ships were beached as they had to be towed back into water afterwards. A similar situation is expressed in the *Bellum Hispaniense*, 40, where a distinction is made between the boats that were on the *litus* and the ships that were on the *salum* (i.e. the beach as opposed to the open waters), but I believe it is not unusual to beach the smaller boats.

The expression *litus attigit*, with the significate of "putting in" or "touching land" appears a couple of times in the literary corpus (*Bellum Africum*, 23 and Livy, 37.60). While two times is certainly a small representation, it seems that the verb *attingere* was the preferred one for reaching land from the seas. Other significant examples, although without the term *litus*, include *Bellum Africum* 19; Caesar, *Gallic War*, 4.23; Catullus, 64.75; Valerius Maximus, 3.7.1c.2.

Finally, like the passage of Servius above, Pliny, *Natural History*, 31.63.191-192, suggests that a *litus* is a sandy place. Probably *beach* would be a good translation for this Latin term, and it might correspond to the places that the *Maritime Itinerary* marks as *plagia*.

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4.12 SUMMARY OF THE TEXTUAL DATASET

In the opening chapters of this thesis, I advocated against translations of the terms researched, for they may lead to wrong assumptions. Instead, I believe that the best working approach is that proposed by the prototype theory (see 2.2.4, 2.2.5 and 2.2.7). However, a difficulty on the application of this theory arises in that ancient Greek and Latin are no longer spoken languages, and in consequence we have to rely on a finite number of surviving texts. In addition, the themes of these texts are enormously wide-ranging, which results in two issues: a) the texts do not record all the details related to the ports, only those that the authors are interested in in each case; b) comparison between texts is arduous due to vast differences in their quality and content. Additionally, a less visible – but highly serious – problem is posed by the textual tradition of each text and the state in which it has been preserved nowadays, and, more significantly, the physical condition of the known manuscripts. Clear examples of that are the fact that the *Stadiasmus* is preserved in a codex unicus, which is not in an optimal state of conservation, and the problem posed by the dichotomy in the preserved manuscripts ναύσταθμον/naustathmon and ναύσταθμος/naustathmos in section 4.6 above.

 Bearing all of these constraints in mind, these are the characteristics that we are able to conclude for the harbour categories of the Roman Empire:

Λιμήν/limen and *portus* correspond to the standard term for a port located within a town or a village and generally including a range of infrastructure and facilities. However, while the sources record advantageous elements of the landscape, like mountains in the background, physical structures, and personnel in the port are omitted for the most part, particularly those relating to everyday functions. While moles are usually recorded thanks to their crucial function in sheltering the coast and owing to the technical prowess of building them, facilities like mooring rings, cranes or warehouses are not mentioned in the majority of the extant literature. The same is true for the workers at the port, like the slaves who loaded and unloaded the merchandise, the officers who tasted the samples or the staff policing the harbour premises. In order to research the harbour infrastructure and its workforce, we would probably do better to investigate the juridical sources, the epigraphy

and the iconography. The literary state of things being such, and given that all of the other harbour categories involve specific traits that *portus* and λιμήν/limen do not have, our best way to define these two terms is that these are the standard forms of ports, that they are located within the area of a town or village. As such these ports should have a number of structures and personnel, although the sources do not generally indicate them. Finally, the λιμήν/limen can in some cases refer to the singular basins within a harbour complex, but it is not clear that this is the case for *portus*.

Ὅρμος/hormos, when not referring to the specific mooring points within a λιμήν/limen, is a port of secondary quality (or in a village of smaller size), where ships can be moored. Ships can generally obtain drinking water and supplies of food in ὅρμος/hormos type ports. These ports are located in bays, or sheltered by capes or offshore islands. The form ὕφορμος/hyphormos seems to be a less sheltered version, and the form πρόσορμος/prosormos might be a dialectal variation of the former. The form πάνορμος/panormos is usually employed as a toponym, but when it is used as a noun or adjective, it designates a mooring place of extraordinarily good quality, or one suitable for all types and sizes of ships.

The ἐπίνειον/epineion refers to the port that is used by a town other than that where it is located, usually because the dominating town is located inland. However, the sources do not seem to limit how much distance there is between the two locations, compare Athens-Piraeus with Pergamon-Elaia. Thus, perhaps "off-site port" is an easy definition for this concept. The term ἐπίνειον/epineion focuses on this political relationship, and to all other effects those ports are like the λιμένες/limenes above. Ἐπίνεια can be established for geostrategic reasons due to war or, more often, trade. In this sense, ἐπίνεια/epineia are regarded as wealthy centres.

An ἐμπόριον/emporion is a commercial port, or the commercial area of the port. As such, it requires very strong ties with the hinterland, where the products for trade are obtained from or in transit to. This entails good communications also by land in the form of roads. The ἐμπόριον/emporion port would also include facilities like warehouses and inns, and staff like bankers, registrars and a police-like corps for the security of merchants. Owing to its long-distance trade relations, ἐμπόρια/emporia were certainly the meeting place of peoples from multiple ethnic backgrounds, who either lived there as imports and exports business owners or were in transit as sailing merchants. Guilds of merchants formed at the ἐμπόρια/emporia, with privileges for their members such as tax exemptions.

A **ναύσταθμον**/naustathmon was a military port, or the military area of a port. Which of these is not clear because the sources are limited, but it is more reasonable to think it would have been one zone, or one basin within a multiple-basin complex. Indeed, the **ναύσταθμα**//naustathma do not generate wealth in the form of tax revenues, which were so essential for the economic viability of the cities. **Ναύσταθμα**/naustathma also do not feature in all of the sources analysed here. The *periploi*, for example, do not record them, as these guides were planned for the use of merchants.

The **σάλος**/salos is an anchorage in open waters, but in relative proximity to the town. Anchoring in the **σάλος**/salos would take place when it was impossible to access the coast, for example due to bad weather conditions (and in consequence, risk of shipwreck) or because the ships were too large and needed to tranship their cargo into smaller boats that could sail in shallow waters.

The term **αἰγιαλός**/aigialos refers to the beach or sea shore, where ships would generally go in case of emergency (e.g. to avoid shipwreck or to take drinking water on board). Generally speaking, it had no harbour facilities, but it could accommodate fishing boats in some cases. The Latin word *litus* essentially means the same in the purely physical aspect. However, textual evidence suggests that *litus* had bad connotations, as it is generally related to shipwreck or to failed military moves.

Data on the **ἀγκυροβόλιον**/ankyrobolion is extremely limited. Etymologically, this is the place where ships can drop anchor. This is unsatisfactory as a description, but it is all that the extant data allows for.

The Latin term *statio* presents very serious issues of polysemy. When it refers to a port, it means a port for temporary anchorage, possibly with the ship anchoring on open waters and involved in transshipment. Temporality is probably due to it not being the final destination for the merchant, or because the merchant ship cannot approach the coastline with the port proper. Alternatively, the *statio* is also the port where an active army can be located, perhaps due to the war operations being seen as temporary, or perhaps because other military facilities were also called *stationes*.

In this fourth section, I have endeavoured to show all of the textual data that could provide useful insights in the search for the sense of each harbour term. In section 5, the case-studies, I aim to investigate of the theoretical assumptions that I will now present are

articulated as expected in real contexts. Further discussion about the ontological relations between harbour forms is presented in section 6.

5. CASE-STUDIES FOR THE TEXTS IN CONTEXT

Up to this point my thesis has focused primarily on the information provided by the literary sources. The careful reading of a large number of texts is a very valid method to establish the implications of each harbour form in a theoretical framework. However, this thesis is also based on the tangible archaeological aspect, and it is good practice that these theoretical assumptions are tested in a physical context. To this effect, I have chosen two case studies: Alexandria, focusing on the different levels of one same port; and the port networks of Southern Italy, which shall contribute to our understanding of the effective relationships between different port types.
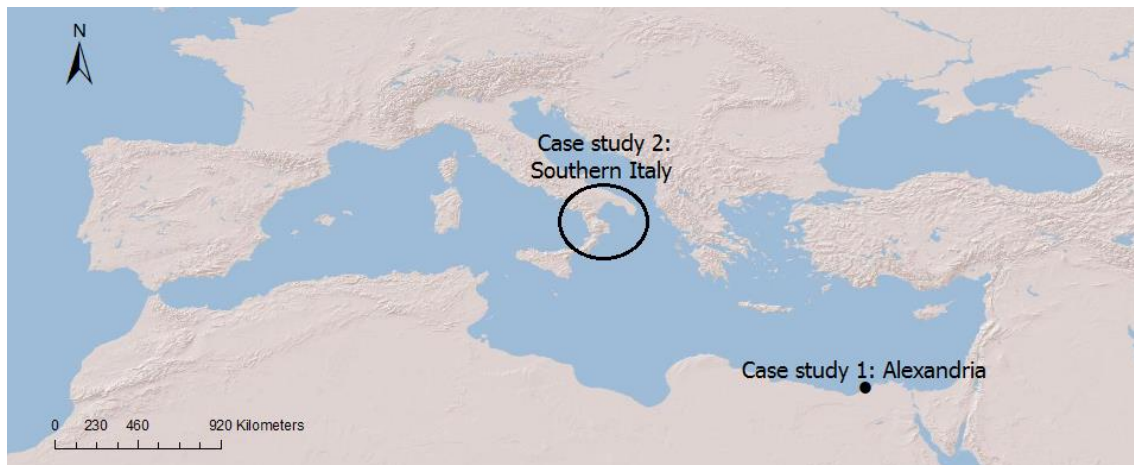
Figure 33. Location of the case studies

5.1 ALEXANDRIA

5.1.1 Introduction

Alexander the Great founded a large number of cities, not to mention garrisons and fortresses. At least 18 of these cities are documented in the ancient sources as bearing the name of Alexandria.[312] This chapter deals with the most famous of his eponymous foundations: Alexandria in Egypt. This city is described in a multiplicity of sources too numerours to discuss here (but see for example Diodorus Siculus 17.52), and the terminology relating to its harbours is varied. I shall examine the use of that terminology in this chapter.

First of all, some physical context. Alexandria has been object of archaeological interest since the 19[th] century (see Empereur, 1998 : 19-34). Archaeologists, however, were often expecting to find big monuments, especially the tomb of Alexander the Great, which have disappeared without a trace. This caused a great loss of interest in the site for a long period of time. Underwater excavations have only been undertaken in recent years.[313] However, as Empereur (1998 : 13, 16-17) notes, excavation conditions on the site of Alexandria are complicated for several reasons: firstly, ancient remains are deeply buried (10 m or deeper) while the water level has risen because of subsidence.[314] Secondly, earthquakes have also played an important role in the destruction of the remains, including the lighthouse. Thirdly, the modern city is built on top of the ancient one, especially after the rapid expansion from mid-19[th] century onwards.[315] This last issue is the most significant one in regards to the city in general. As McKenzie (2007 : 2) notes, «it is only harbour structures, such as breakwaters and quays, and some islands which are now underwater, along with loose fragments of architecture and sculpture, largely dumped along the shoreline to prevent the approach of crusader ships. The area of nearly all the ancient city is still on dry

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[312] For a detailed analysis of Alexander's foundations, especially concerning the literary tradition, see Fraser (1996).

[313] See Empereur, 1998. Specifically for the tomb of Alexander, see pp. 145-154.

[314] For photographs of the underwater excavations and some drawing models of the ancient city, see La Riche (1996), Empereur (1998 : 64-87) and Goddio et al. (1998).

[315] E.g. there was an entire well-preserved Roman camp in the eastern quarter of the city but it was destroyed. Together with the city walls and many necropoleis, the blocks were re-used for new buildings. Fortunately, many modern buildings have shallow foundations, which means that the ancient ruins underneath may be in a relatively good state. Nowadays abundant rescue digs are carried out. See Empereur (1998).

land under the modern city». In this sense, it is also important to consider the destruction inflicted upon the ruins by the re-using of ancient construction materials for modern buildings or infrastructure (Empereur, 1998 : 8-18, esp. p. 9).

5.1.2 Historical background

Alexandria was founded by Alexander the Great in ca. 331-332 BC.[316] Some modern researchers, due to a confusion in the ancient sources, believe that there was a previous settlement called Rhakotis in the area.[317] Some of the misleading ancient sources include Pliny, *Natural History*, 5.62 and Strabo 17.1.6, who create the confusion due to their ignorance of the native Egyptian language. Empereur (1998 : 37) quoting Chauveau,[318] summarises the problem very effectively: Rhakotis (Ra-qed in Egyptian) – that is, 'building site' – was the name given by the Egyptian native inhabitants to Alexander's new city, and it seems they consistently refused to call the settlement by the Greek name. This demonstrates that Alexandria was an entirely new city, not built upon previously conquered structures, in spite of the linguistic confusion of the Classical authors, who were nescient of the Egyptian native language, and believed that Rhakotis was a previous settlement. This confusion has also misled some modern researchers.[319]

In 4.3 it was argued that an ἐμπόριον/emporion usually involves colonial relations. Alexandria was founded ex professo, arguably with foresight to the commercial advantages. It then became the capital of the Ptolemaic dynasty, who were Alexander's successors in Egypt. Finally, Egypt became another of the possessions of the Roman Empire in 30 BC as a consequence of the Battle of Actium (31 BC).[320] Thus, in a way, there was a certain relationship between Alexandria and Rome similar to that of a colony and a metropolis.

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[316] For a concise summary on the history of the city: Venit (2012).

[317] Robinson and Wilson (edd.), 2010, p. 35 and note 1. For the harbour characteristics see esp. ibidem pp. 53 ss.

[318] The work adduced here is: M. Chauveau, *L'Egypte au temps de Cleopatre*, 'La vie quotidienne' series (Hachette, 1997) p. 77. I have not been able to access the original work to view it in person, but Empereur constitutes a well reliable source to quote from.

[319] Consequently, Empereur warns, some points like the pharaonic elements in the city have not been explained correctly. This issue, though, does not belong to the scope of my thesis.

[320] On the battle of Actium, see for example: Horsfall (1981), Carter (1970) and Tarn (1931).

5.1.3 Setting and position of Alexandria
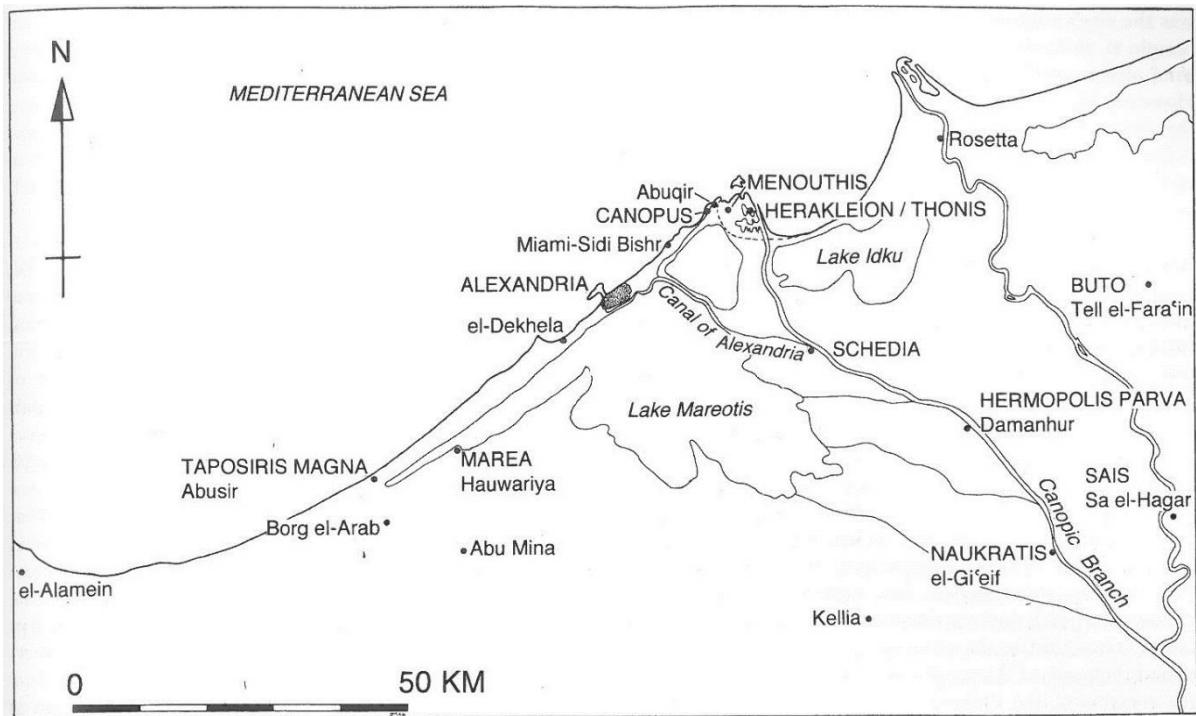
Figure 34. Position of Alexandria and other towns in the Nile Delta (source: McKenzie, 2007, p. 33, fig. 35)

Alexandria lies near the Canopic mouth of the Nile delta.[321] The whole coast of Egypt is described as dangerous and unnavigable except for the magnificent port of Alexandria, among others by Diodorus Siculus, 1.31.2-5. He attributes the issue of poor navigability along the Egyptian coast to sand deposits, which together with the ignorance of the coast causes the ships to run aground. Furthermore, Williams (2004 : 5) explains yet another problem: because of the Nile floods, many of the ports in the Delta became blocked by silt deposits and required re-building every few years. In the same sense, Khalil (2010, p. 34) states: «harbours located at the Nile mouths were more vulnerable to silting by the deposited sediments, eventually leading to their decline. This was not however the case with Alexandria, which was located west of the westernmost branch of the Nile». With significant sediment deposition to the east of the Nile mouths as a result of the prevailing

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[321] For a description of the Nile Delta in the Roman period up to the Arab era, see Cooper (2014 : 29 ss., esp. 40 ss). For the branch of the Nile near Alexandria, pp. 48ss, and the maps on pp. 265-266.

currents, Alexandria was therefore less prone to harbour siltation. This "safe distance", then, made it possible for Alexandria to develop its port throughout the centuries.[322]

In fact, Alexandria itself, like other sites [323] in the ancient delta, has suffered from subsidence, not to mention that the Mediterranean Sea has risen in level since antiquity.[324] This resulted in the submergence of the remains of the harbour, which now lie underwater. Goddio (1998 : 12), observes that the submerged harbour infrastructures are nowadays at a depth of 6.8m, and he estimates a difference of 8m with the original level of the land. Occasional extreme events, such as earthquakes, aggravated subsidence issues. One such event is documented by Agathias, 2.15.

On the advantageous position of Alexandria, the city was founded on a small, hilly tongue of land between the Mediterranean to the North and Lake Mareotis to the South (Grimm 1998 : 18-19). The latter was a huge inner lake and reservoir of sweet water, while at the same time it provided strong connections with the Hinterland production centres. Williams (2004, p. 2) argues that Alexander needed to found cities in order to ensure the success of his army. Maritime cities, like Alexandria in Egypt, were vital to keep the army supplied with victuals, as well as to provide a place of shelter in an originally hostile territory.[325] She also notes (p. 3) that Egypt was an excellent place for commerce, as it was already active as a trade centre, connecting eastern exports with western markets. In fact, Fraser wonders

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[322] In the Middle Ages, Alexandria still benefited greatly from its natural position. See Cooper (2014 : 201 ss). Alexandria still dominated Egyptian commerce in the medieval period, and especially commerce with the Mediterranean. The loss of power is especially due to the disappearance of the canal with Lake Mareotis. The Canopic branch of the Nile disappeared as well, with the closest Nile branch then being Rosetta. However, new canals were excavated, as it was easier to sail between the Mediterranean and the Nile through the canals than using the harbour at Rosetta, due to the geomorphological dangers at the point of connection between the river and the sea. Archaeological data does not demonstrate a decline of the city after the Arab conquest in 642, although it lost its political privilege as capital of the region.

[323] For the number of towns in the ancient delta, see Diodorus Siculus, 1.31.7 (18,000 in ancient times, 30,000 recently). Herodotus, 2.177, counts twenty thousand cities in Egypt. The figures in these literary texts are clearly exaggerated and it is best to consider them not as exact quantities but as an emphatic way of saying how fertile the Delta was.

[324] For details on the complications of assessing the ancient sea level on the Nile Delta, see Warne and Stanley (1993).

[325] In this sense, the presence of the island of Pharos proved most beneficial. Empereur (1998 : 43) explains that the colonisation of places with offshore islands is a typical Greek process, especially when the mainland was still not under their control. The aim was to make the island a secure base before jumping onto the mainland. For a classification of the ancient ports in the Mediterranean islands, see Giaime et al. (forthcoming).

if Alexander already foresaw this commercial success.[326] Of course, though, the main impuls to the development of the port of Alexandria took place under the Ptolemies.

The geographical location of Alexandria is most beneficial, taking into account that the island of Pharos and Cape Lochias helped shelter it against the sea currents. This protection was further improved by the building of the Heptastadion, a causeway connecting Pharos to the mainland. Of course, the proximity to the Nile and Lake Mareotis[327] was essential for commerce and distribution of goods from the country into the Mediterranean ports and vice-versa. As Alexandria only borders directly with the sea, a system of canals became essential (Figure 35). These canals connecting Alexandria with the Nile and with Lake Mareotis were essential in order to communicate the trading city with the rest of the country and thus facilitate imports and exports. Textual sources are scarce in this regard, but see for example Strabo, 17.1.10, where two canals are mentioned: one from Lake Mareotis discharging in the Eunostos basin and another one near the Canopic Gate. Cassius Dio, 51.18.1, reports that Augustus had some canals excavated and others dredged. Indeed, Khalil (2010 : 36) states: «although these canals were mentioned in a number of ancient sources, there is a considerable degree of uncertainty about their exact number and location and the routes that they followed».

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[326] Contrary to that, Grimm (1998 : 16-17) finds the appearance of the harbours surprising. He writes that at the time of the Mycenaean heroes, the uninhabited island of Pharos must have been still desolate. The inhabitants of the area would have only survived on fishing, as other foodstuffs were probably not available. Because of this, he finds it still the more surprising that such a huge functioning port was founded in this area. That is, however, a poor argument. The fact that one area was not well developed at a certain point in time does not mean that it cannot become richer in the future.

[327] On the physical characteristics of Lake Mareotis, see Blue and Khalil (2010), Khalil and Trakadas (2011) and Blue and Khalil (2011) for the archaeological and economic approach.
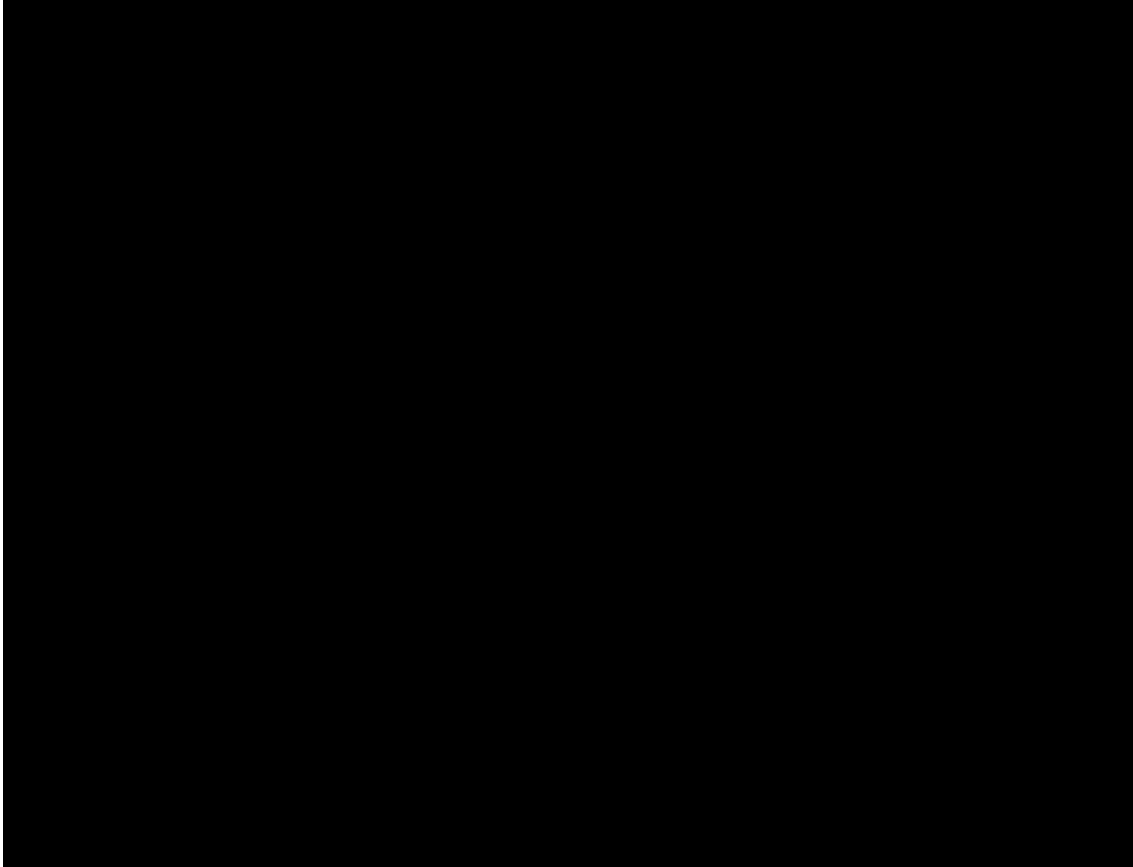
Figure 35. Map of Alexandria's waterways system. Source: Hairy (2009) p. 116

The canals connecting Alexandria with the Nile and Lake Mareotis proved essential for commerce.[328] Agricultural and commercial products were most easily sent to Alexandria via the Nile. There was also considerable produce in the area around Lake Mareotis, which was also shipped to the city by means of canals. Once in Alexandria, they were introduced from those water bodies into the ports by the system of canals, and from the ports into the Mediterranean markets, or vice-versa (i.e. imports from the Mediterranean came into Alexandria's seaports and from there up the Nile into the rest of the country).[329] The two-way commercial relationships are noted by Strabo, 17.1.7. He states, though that exports from Alexandria outnumbered considerably its imports.

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[328] See Empereur (1998 : 213-239); and Cooper (2014 : 48 ss.), for the reconstruction of the canals based on the Arab sources and for the new Arab canals; for Lake Mareotis, ibidem, pp. 69-72.

[329] Bibliography is more focused on the Alexandrian exports rather than on its imports and redistribution to the rest of the region, but see: Leider (1934); Kenawi (2014); Khalil (2005); Rostovtzeff (1906).

Unfortunately we have no clear evidence of the exact routes to and from Alexandria followed by specific types of vessels (Khalil 2010 : 41). Nevertheless, the Schedia canal[330] seems the most likely option for the traffic bound to Alexandria, at least for those ships sailing up the Nile. Archaeologists have hypothesised the existence of another canal parallel to the Schedia, running through the city connecting Lake Mareotis with the harbour at Alexandria, but that is less certain. Khalil warns that this journey up the Nile would have been against the prevailing winds, so the vessels may well have been towed by men or animals on shore, or else they might have made use of oars rather than sails. Indeed, in the papyrus p.panop.beatty 2 (AD 300), it is clearly written that a ship transporting pillars needed to be towed due to lack of favourable winds.[331]

In relation to the land transport, Alexandria was at the starting point of a major Roman road that crossed the whole north African coast running in the direction of Gibraltar. The road might well have been used in some cases for merchandise transport. This might have been the case, for example, when the sea was not navigable due to climatic reasons, or to ease the transport operations so as not to sail against the prevailing sea currents or winds.[332]

We can hypothesise that some space may have been reserved in the port for fishing activities or for the land necessities of fishermen (e.g. shipsheds, docks, possibly stalls for selling their capture). It is reasonable to think that seamen would fish near the harbour (not *in* the harbour, in order to avoid the heavy traffic of sea-going ships), and probably made use of some harbour installations. However, textual sources only document fishing in the Nile and in lakes rather than in the sea (see Diodorus Siculus, 1.36.1 and 1.52.6). Yet there is no reason to think fishing in the sea did not take place, and we can conjecture that it was likely just an everyday activity that went unrecorded in the chronicles. Indeed, mosaics depict fishermen at the edges of harbours, as fish seem to have gathered near human-made structures (e.g. breakwaters). This may have been the case in Alexandria, too.

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[330] For details on the canal network, see Hairy (2009 : 114-161) and Khalil (2010). For the Schedia canal in particular, see Bergmann and Heinzelmann (2004).

[331] For a general study on navigation on the Nile, see Arnaud (2015b). For journey times on the Nile and the Red Sea connection, Cooper (2014 : 155 ss., esp. pp. 162-164); for the medieval sailing connections of the Nile with the Mediterranean and the Red Sea, pp. 167-183.

[332] See Schneider (1984) and Romanelli (1938).

5.1.4 Harbour area

The main feature of Alexandria was its commercial harbours, which were situated in the northern part of the city (Figure 36).[333] They were especially well sheltered by the offshore island of Pharos, which Alexander had connected to the mainland by means of a causeway. It is not always the case that ports benefit from an offshore island, but it was certainly taken advantage of in those cases where nature made it available. Pharos was inhabited by the time of Caesar's invasion, but Strabo documents that in his days it was deserted except for a few fishermen (Caesar, *Civil War*, 3.112; Strabo, 17.1.6).
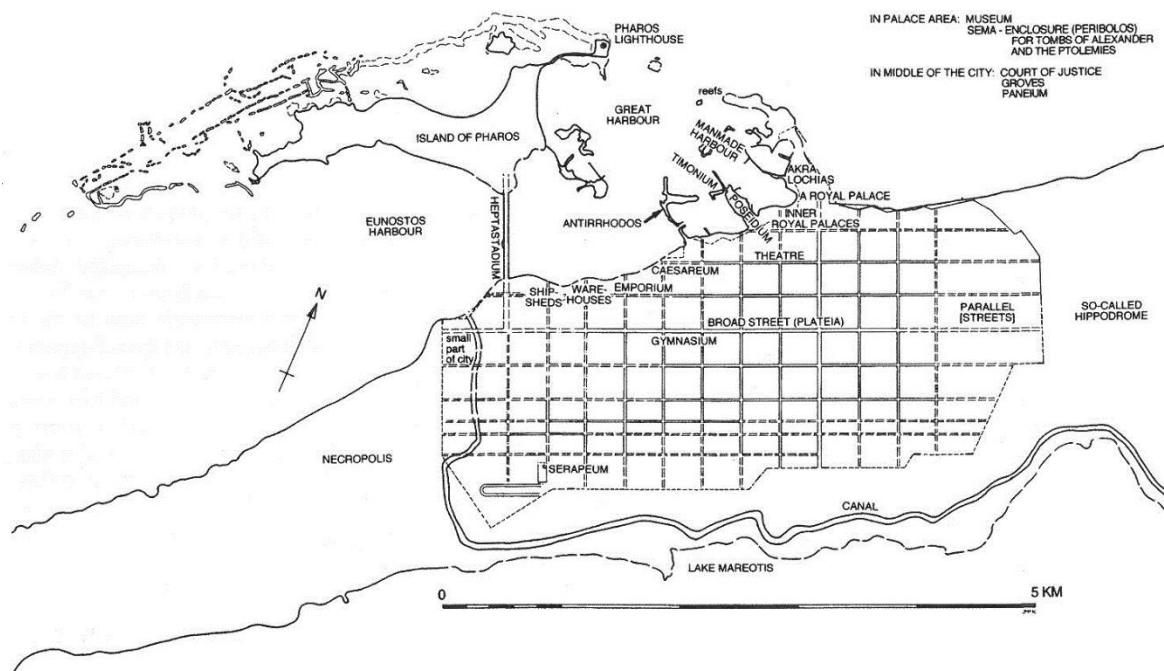
Figure 36. Monuments and facilities in Alexandria (Source: McKenzie, 2007, p. 174, fig.298)

The island of Pharos was connected to the mainland by a long causeway known as the Heptastadion. This causeway served as a bridge to communicate both lands but also carried an aqueduct, and it was bisected by two canals so that ships could sail through it from one harbour into the other. These openings might have been the so-called Diolkos (Strabo, 17.1.6). This Heptastadion created a double port, with its western basin known as Eunostos ('good return'), and the eastern simply called Great Harbour (Megas Limen / Portus Magnus). Inside the Great Harbour, four smaller basins formed "sub-ports", a

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[333] For details of the topography of Alexandria since Ptolemaic times until the Arab era, see Tkaczow (1993).

feature which is already noted by Strabo, 17.1.6.[334] Strabo describes the Great Harbour as ἀγχιβαθής, i.e. having sufficient inshore depth, so much as to accommodate the largest vessels. Strabo also notes some steps (κλῖμαξ) where ships can moor. This is possibly due to create different levels depending on the size of the ships. The Heptastadion, Khalil notes (2005, : 109), also acted as a breakwater and sheltered the Eastern Harbour from the prevailing western winds, although it was used as well as a landing quay. The location of the Heptastadion has been discovered thanks to geophysical survey, confirming its orientation along the north-south axis of the city street-grid. Very interestingly, Millet and Goiran (2007) demonstrate that the construction of the Heptastadion helped influence the sediments dynamics within the harbours, and especially it contributed to protect the Eastern Harbour from infilling with sediments.

Khalil (2005, vol. 1 : 109-122), provides concise descriptions of the harbours. The Eastern Harbour was the larger of the two, and had a narrow entrance,[335] which was further made dangerous by the submerged reefs, as documented by Strabo, 17.1.6, although investigations on erosion show that these reefs may have been at some point over the surface. Khalil (2005, vol. 1 : 111) also suggests that the smaller basins in the Eastern Harbour may have been used by the Ptolemaic fleet, or privately by the Kings of Egypt, since that was where the palaces were located.

Under Roman rule, it seems plausible that the Alexandrian basins, however large, would have been further modified to cope with the increasing volume of trade (Khalil, 2005, vol. 1 :112), and to house the *Classis Alexandrina*, the fleet in charge of policing the harbour and supervising especially the transport of grain.[336] However, Khalil (2005, vol. 1 : 116) notes that no substantial development was added to the Alexandrian ports by the Romans, and points especially to the lack of hydraulic concrete and *opus signinum*. However, the presence of a stable garrison has been confirmed (first under the reign of the Ptolemies and later during the Roman Empire),[337] thus indicating that the Alexandrian harbours had some degree of military functions apart from the commercial ones.

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[334] Khalil (2005 : vol. 1 pp. 109-122); Botti (1898); Goddio (1995); Jondet (1916); Williams (2004).

[335] See, for example, Caesar, *Civil War*, 3.112.

[336] For the *classis Alexandrina*, see Reddé (1986). For the military defences of the city, Empereur (1998 : 46-53).

[337] For a summary on the garrisons at Alexandria, see Williams (2004 : 67-69). For a rationale on commerce, see ibidem, pp. 72-92.

The Diolkos, for instance, seems to be a Roman foundation. Its exact location and function remains unclear, as it is only mentioned explicitly by Oribasius (2.58.54-55, repeated in 2.58.129).[338] It seems, though, that it was a passage on land or cut through land to enable the ships (or possibly their cargoes) to pass from one harbour into the other, safe from the violent sea currents and reefs.[339] It has been hypothesised that the Eastern Harbour may have housed the biggest dockyard in Alexandria for the construction and repairing of ships, but there is up to present no archaeological data available.

The Western Harbour, Khalil points out (2005, vol. 1 : 115), may have acquired its nickname Eunostos (εὐ-νόστος, 'good return') out of sarcasm, as it was hard to manoeuvre into and outside of it due to dangerous reefs and winds. However, inside this harbour there was an artificial "closeable" basin (Strabo, 17.1.10), the so-called Kibotos ("the Box"), which was navigable and probably it was also the place to which the canal from the Lake Mareotis connected.[340] The Western Harbour, however, is not abundantly discussed by the sources that fall within the timeline of this thesis. In fact, Khalil (2010 pp. 114) points that it is barely mentioned at all in documents after the 1st century BC. No archaeological excavations have been carried out on the site, which is now largely urbanised.

Goddio and his team (Goddio et al. 1998 : 1-52) excavated the submerged part of the harbour, especially the Great Harbour, where they produced some interesting finds, including ancient remains of quays or breakwaters. Their excavations have also located a number of islets inside the Great Harbour. One of these islets should be identified with the ancient Antirhodos (Goddio et al., 1998 : 28ss). On one of the islets there have been found four epigraphic documents in Greek, sphinxes, and ceramics dating between the 1st century BC – 2nd century AD, which hint at the period when an earthquake caused subsidence in the area. Goddio and his team have noted the presence of a reef that helped shelter part of the harbour from the swell.

Jondet (1916) has found some large harbour constructions on the island of Pharos. It is difficult to identify all port structures with the modern data, as the newer research, like that

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[338] According to Khalil (2010 : 113), the passage is quoting Xenocrates of Aphrodisias.

[339] See Fraser, 1961. Fraser does not really clarify what the diolkos exactly is. One is tempted to suppose that it was instead one of the passages open through the Heptastadion that connected both ports, but solid evidence for that is missing. Compare also the diolkos in the ports of Corinth: Verdelis (1958), McDonald (1986), Raepsaet (1993).

[340] For the canals, see Khalil (2005 : 90 ss.) and Empereur (1998 : 130-137).

by Goddio's team (1998), investigated the main Alexandrian basins, rather than the structures by the island of Pharos. This would, however, be a highly interesting archaeological topic to investigate: did ships maybe use Pharos as a "fore-harbour" before entering the larger basins? Were the structures on the city and on the island used for different cargoes, or ships of different sizes or purposes? These are some of the questions for which we have no answer up to date.

A final issue that must be taken into consideration is the extent of the maritime port. The Great (Eastern) Harbour is indeed very well-located, between Lochias and Pharos. On the contrary, Eunostos Harbour is more problematic. Five texts seem to suggest that Alexandria's Western port reaches out to a certain place called Chersonesos or Cherronesos. The texts are namely:

1. *Alexandrian War*, 10
2. *Stadiasmus*, 1
3. Pseudo-Scylax, 107
4. Strabo, 17.1.14
5. Ptolemy, *Geography*, 4.5.9

The contents of these texts pose a problem somehow, which I believe is best solved by analysing the literary data in correspondence with the physical environs. Figure 37 summarises the contents of the texts as placed on the map:
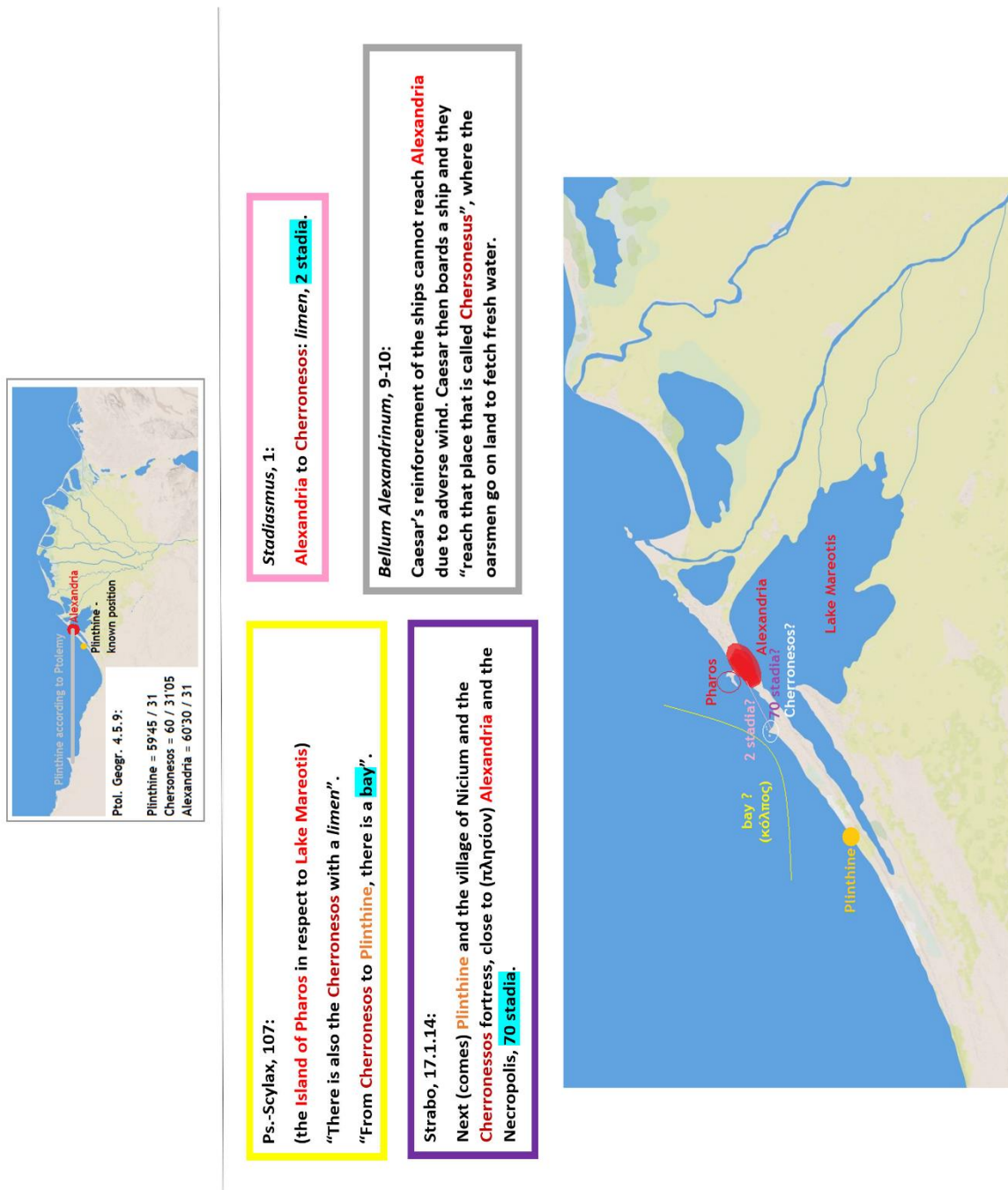
Figure 37. Location of Chersonesos / Cherronesos according to different literary sources

These texts have in common that the port of Alexandria was closely related to the place called Chersonesos. But where was that place? Chersonesos cannot be located from Ptolemy's text because of a topographical mistake (the reference town of Plinthine is

situated in the wrong location). Caesar's text does not provide substantial geographical data, so the other texts will need to be analysed instead.

Chersonesos / Cherronesos means 'peninsula'. There is a small tongue of land between Alexandria and Plinthine, which could be the ancient Chersonesos. There are about 11 km in a straight line between Alexandria and the site I suggest for Chersonesos, and about 14 km by land. If a land stadion is ca. 185 m, the 70 stadia proposed by Strabo add up to roughly ca. 13 km. The site is situated at a plausible distance. Stadia by sea are inexact, as they rely on a rough appreciation of the landscape,[341] so the text of the *Stadiasmus* above is inconclusive. The coast between Alexandria and Plinthine is generally even but the headlands of Pharos Island (with the causeway) and Chersonesos do seem to form a small bay-like enclosure in the sea, as suggested by Ps.-Scylax. The bay-like area starting in Chersonesos seems physically well integrated with the Eunostos Alexandrian harbour (West of Pharos). It is thus not surprising that some sources consider Chersonesos a natural extension integral to the Alexandrian harbour system.[342]

Indeed, the tongue of land marked in the map above seems to be the only eligible candidate. However, there is one objection that has to be made, namely the geology. If the site was made of rock, it is likely that it has been this way since antiquity, and therefore the identification would be certain. If, on the contrary, the site is part of a sandbank caused by longshore drift and siltation (as is the geological case in the majority of this region), then it could be that the shoreline has changed over the course of time and thus the identification would be more problematic.[343]

5.1.5 Harbour facilities

Probably the best-known landmark of the harbours at Alexandria is the lighthouse on the Pharos Island. So great an achievement caused the toponym to designate any lighthouse in the romance languages.[344] The lighthouse was not just useful during the night, but also

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[341] For long distances, the stade depends on the distance that the ship can travel during the course of one day.
[342] Cf. also Pseudo-Scylax, 107: ἔστι δὲ καὶ Χερρόνησος καὶ λιμήν; "there is also Chersonesos and (its) limen".
[343] I thank Dr Leif Isaksen for this observation.
[344] Catalan *far*, Spanish and Italian *faro*, French *phare*, etc. As a curiosity, a street lamp in Catalan is denominated *farola*, which also ultimately derives from *Pharos* (Coromines, 1985, s. v. *far*) Current bibliography on the topic of lighthouses leaves much to be hoped for. For concise approaches, see: Hague (1973 : esp. 293-303); Daremberg and Saglio (1877); Hague and Christie (1975 : esp. 1-9) for the classical

during the day. If sailors lost sight of the land, the lighthouse produced excellent smoke signals to help them find their way. Nevertheless, initiatives to find its remains have so far been unsuccessful. The problem is very well summarised by Empereur (1998 : 82-87): at the beginning of underwater explorations, the first researchers concluded that whatever underwater remains they found corresponded to the lighthouse, obviously lacking reliable evidence.[345] Instead, it seems more likely that the lighthouse stood on the site where Fort Qait Bey now stands. The fort was built after an earthquake in the 14th century, which probably destroyed the lighthouse. However, judging by the number of shipwrecks outside the harbour, Khalil points out (2005 : 114), it seems that the lighthouse did little to help avoid the dangerous reefs at the entrance of the port. Note, though, that lighthouses in antiquity served a different purpose than nowadays. While today we use lighthouses to warn ships of danger, in Antiquity and the Middle Ages lighthouses were relied on in order to bring ships to a set point in land, i.e., as orientation markers rather than as warning signs. However, the word survived because the basic structure is the same.

The lighthouse might have been the work of Ptolemy Soter and was inaugurated by his son, Ptolemy Philadelphos, in 283 BC (Empereur, 1998 : 82-87). Plenty of depictions on coins, mosaics, and lanterns are extant, as well as a structure of similar shape at Taposiris Magna.[346] Textual descriptions from antiquity are rare. The modern reconstruction offering most consensus is the model by Hermann Thiersch.[347] Nevertheless, it is still not clear how some architectural elements of the lighthouse were articulated, in particular about the characteristics of the space for the beacon and if there were any statues on top of it. Empereur, though, deduces from his excavations that there may well have been monumental statues at the foot of the tower.[348]

Unfortunately, there is not much information about specialised zones within the port. Leider (1934 : 11) identified several distinct areas: firstly, the *emporion* proper near the

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period with a map on p. 2. Otherwise, one has better look for studies focusing on a specific site or subject, like Giardina (2010 : esp. pp.1-22, 121-137); Frost (1975); Hutter (1973); Rosen et al. (2012); or Latorre Gonzalez-Moro and Caballero-Zoreda (1995). I also recommend the forthcoming work by Jonatan Christiansen.

[345] For the accurate underwater excavations carried out by Empereur (1998 : 64-87).

[346] For a photograph, Empereur (1998 : 225).

[347] An image can be found in Empereur (1998 : 83).

[348] Empereur (1998 : 77), notes that ancient authors locate the lighthouse at the eastern end of the Pharos island, where some statues were found. It is reasonable to assume that the Ptolemies would have picked such a site to erect statues for their own propaganda, as those would have been seen by sailors approaching the port. Empereur estimates the statues to have been about 12 m high.

Great Harbour, which according to him was separated into a zone for citizens and a zone for foreigners. The ἐμπόριον/emporion proper as the delimited space for commercial deals is indicated by Strabo as a reference point when he locates the temple to Poseidon (17.1.9). In that passage, the *emporion* is picked out as a very precise reference point in order to locate the temple of Poseidon, situated on a nearby elbow of land. [349] Ἐμπόριον/emporion came to designate the whole city, rather than the specific commercial zone. The foreigner's zone in the commerce area proper is documented in the dedication from Theagenes to his father, who held the office πρὸς τῆι ἐπίστατείαι τοῦ ξενικοῦ ἐμπορίου ('for the supervision of the foreigners' *emporion*) in the 2[nd] century AD.[350] It is from this dedicatory for an employee of the foreigners' ἔμπόριον/emporion that Leider infers the existence of a citizens' ἔμπόριον/emporion parallel to the former. Leider also notes the controversy caused by Preisigke, who stated that the foreigners' *emporion* could well have been a "duty-free" zone. Instead, I agree with Schubart and Leider, who believe that the Ptolemaic kings would not have missed such a good chance to levy customs taxes. In fact, Strabo himself (17.1.13) states that the goods imported from Aethiopia and India were taxed twice (once when they arrived and once when they were exported again), and there is papyrological evidence for a specific tax for the maintenance of the fleet (Sirks, 2010², pp. 183-184, esp. notes 14 and 15).[351]

Alexandria being a major port, also had some infrastructure. We know there existed shipsheds (*navalia*) and warehouses (*apostaseis*). These buildings are documented, for example, in Strabo, 17.1.9; Caesar, *Civil War*, 3.111, Plutarch, *Life of Caesar*, 49.5-7, Cassius Dio 42.38.2, and in the *Alexandrian War*, 12-13. On the monumental aspect, though, Bernand (Goddio et al., 1998 : 145) highlights the surprisingly small number of epigraphic documents found on the site of the Eastern harbour. These are not relevant for

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[349] Goddio et al. (1998 : 26) hypothesise that there were in fact two places called ἐμπόριον/emporion. However, I have not been able to find any textual evidence on the subject, nor do they provide any reasons for such a hypothesis, other than "it has been done", without saying by whom or on what grounds.

[350] In other words, from this dedicatory for an employee of the foreigners' *emporion* Leider infers the existence of a citizens' zone parallel to that.

[351] This tax was called λόγος ναύλων θαλασσίων, but it was sometimes shortened to ναῦλος θαλασσίων, λόγος ναύλων or λόγος θαλασσίων. Sirks discusses the following papyri as evidence for it: SB. 5.7621 (=P.Princ.Roll.2), P.Cair.Isid.59, P.Oxy.17.2113, P.Cair.Isid. 60, P.Col.7.130, SB 16. 12824, P.NYU 12, P.NYU 1.3, SB 14.11702, P.Cairo.Preis. 33, P.Oxy.16.1905, O.Stras. 172, P.Lips. 1.64, P.Oxy.1.126, P.Oxy.50.3634. This tax was probably raised for the maintenance of the fleet that shipped the Egyptian grain.

this thesis, as they do not contain substantial information on the activities of the ἐμπόριον/emporion.

A common necessity both for sailors and for the inhabitants of the city in general was the supply of drinking water. Numerous remains of cisterns have been identified on site (see Botti, 1898 p. 81 and Empereur (1998: 125-144, with a map on p. 129). The system of cisterns is documented by the *Alexandrian War*, 5.

5.1.6 The terminology applied to the physical site

In the Greek documentation consulted, three terms appear in connection with the harbours at Alexandria: ἐμπόριον/emporion, λιμήν/limen and ὅρμος/hormos. In Latin, the only word employed is *portus*.

After the data collection I undertook, the Latin term *portus* appears to be the core word for a well-established port, while other terms are employed when referring specifically to harbour forms that are small / deprived of infrastructure, temporary or military, most notably *statio* and geographical terms such as *litus*. The port of Alexandria being a major site, it should not be called by one of the minor terms. The obvious counterpart in Greek is the λιμήν/limen. Generally speaking, a λιμήν/limen is the harbour proper, where the activity of the ships takes place. This is why the harbour basins at Alexandria are named by the term λιμήν/limen (for example, Strabo, 17.1.6-8).

The term ὅρμος/hormos appears in a single document only: P. Tebt. 1, 5, line 25 (ca. 118 BC). This text states that officers may not seize merchandise ἐπὶ τῶν κατ᾽ Ἀλεξά(νδρειαν) ὅρ[μων] ("by the anchoring points at Alexandria"), unless tax has not been paid for or if it is a product illegal to import. This context, then, clearly suggests that the ὅρμος/hormos refers to the specific pier, mooring ring, post or similar structure where the ship would be moored. This is consistent with the literary investigations that I have carried out on this term, pointing to the ὅρμος/hormos being the specific anchorage point where the ship would be moored.

After examination of the textual data, it can be concluded that the different terms in Greek can be applied to the same site depending on the perspective of the author (or speaker). This is not the case for Latin, where *portus* covers the larger semantic space, and other terms are used only in particular cases. But in Greek, the papyrus above, for instance, refers to the ὅρμοι/hormoi, or anchorage points, rather than λιμένες/limenes, or harbour basins,

because that was a more precise term. In the same way, when authors wanted to emphasise trade, the would employ ἐμπόριον/emporion, rather than the generic λιμήν/limen. But when texts had purely descriptive purposes, λιμήν/limen was sufficient to convey the semantical notion of a port to the wider public. In short, we must vehemently reject the notion that each place was designated by a specific word and look at the wider context instead.

5.2 PORT SYSTEMS IN PUGLIA, BASILICATA AND CALABRIA

5.2.1 Introduction

In section 5.1.6, I discussed the different expressions that can be applied to the same site depending on the emphasis of the speaker: whether it is the commercial part, the anchorage facilities or the unity of it. For this second case-study a wider area has been selected in order to investigate the effective coexistence, networking and hierarchical distribuition between different harbour forms. Based on the available ancient literature, the area that proved both feasible and interesting was the southernmost part of Italy, because a variety of port forms are documented in it. The land selected corresponds to the present-day regions of Puglia, Basilicata and Calabria, and I will focus on specific port systems for discussion. Some notes of caution are needed, though.

Firstly, some of the sources, especially those relating to Tarentum, narrate events from the Punic Wars or other periods before the Roman domain. These events took place prior to the timeline selected by the Portus Limen Project (1st century BC – 3rd century AD). However, the information provided cannot be wholly discarded because these anchorage forms were referred to by authors belonging to the period of study, potentially indicating the type of anchorage that they expected in their age from each location.

Secondly, the writings of Strabo and Pliny\f"author" suffer from a problem of anachrony. It is generally the case that they were re-writing pre-existent materials. Therefore, while both authors were active within the Portus Limen timeline, the usage that these two authors make of the terminology is not self-evident a priori. However, the fact that they do employ these terms proves that in the 1st century BC – 1st century AD, those words were still understood among the audiences of Strabo and Pliny respectively, and it is worth taking their texts into account.

Lastly, some of the sites in the area have not been located with precision, although we have a rough idea where they should be. This is the case of Medma in 5.2.3, for instance, where I hope I can contribute to the location of its two anchorages thanks to the linguistic analysis that I have carried out in section 4.

5.2.2 Ports labelled ἐπίνειον and not λιμήν:

5.2.2.1 Hipponion /Vibo Valentia

Some of the ports in the study region are deemed to be ἐπίνεια/epineia and not λιμένες/limenes. A notorious case is Siris and Kallipolis in relation to Tarentum (discussed below: 5.2.5). Other cases are Vibo Valentia and Rouskiane. As demonstrated in section 4.2 , an ἐπίνειον/epineion is essentially a subjugated port. It is the harbour controlled by a bigger or richer town situated inland, or at a different location. Vibo Valentia is a paradigmatic case of this. According to Strabo, 6.1.5, the Locrians founded a town called Hipponion at the side of the Calabrian peninsula opposite to Locri (this would later become Vibo Valentia).[352] The foundation can be dated to the late 7th century BC. It had the advantage for the Locrians that they could now have access to both the Ionian and the Tyrrhenian seas. The Locrians were themselves of Greek origin,[353] but they were de facto independent from their motherland. Hipponion also seems to have been institutionally independent from Locri, despite maintanance of Locrian influence upon it. Figure 38 shows the locations of these towns:

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[352] Fronda (2010) points that Hipponion came into Roman power at some point about 194 BC as a result of the Second Punic War. The Romans renamed the settlement as Vibo Valentia and instituted a Roman *colonia* there.

[353] According to the legend, while men from the Greek region of Locris were fighting in the war (probably the First Messenian War), their women began amorous relationships with their slaves. Just before or upon the return of the men from the war, the women fled to Italy with the slaves and founded the town of Epizephyrian Locri. The slaves became free men, but the nobility status still depended on that of the women. Eventually, Epizephyrian Locri, also known as Zephyrion, was abandoned owing to fierce winds in its port (Strabo, 6.1.7), and the location known nowadays, indicated in the map above, was chosen for the second foundation of the city of Locri. It is not clear where the first town was situated, the available maps and gazeteers point it to the area of present-day Monasterace. See Sourvinou-Inwood (1974).
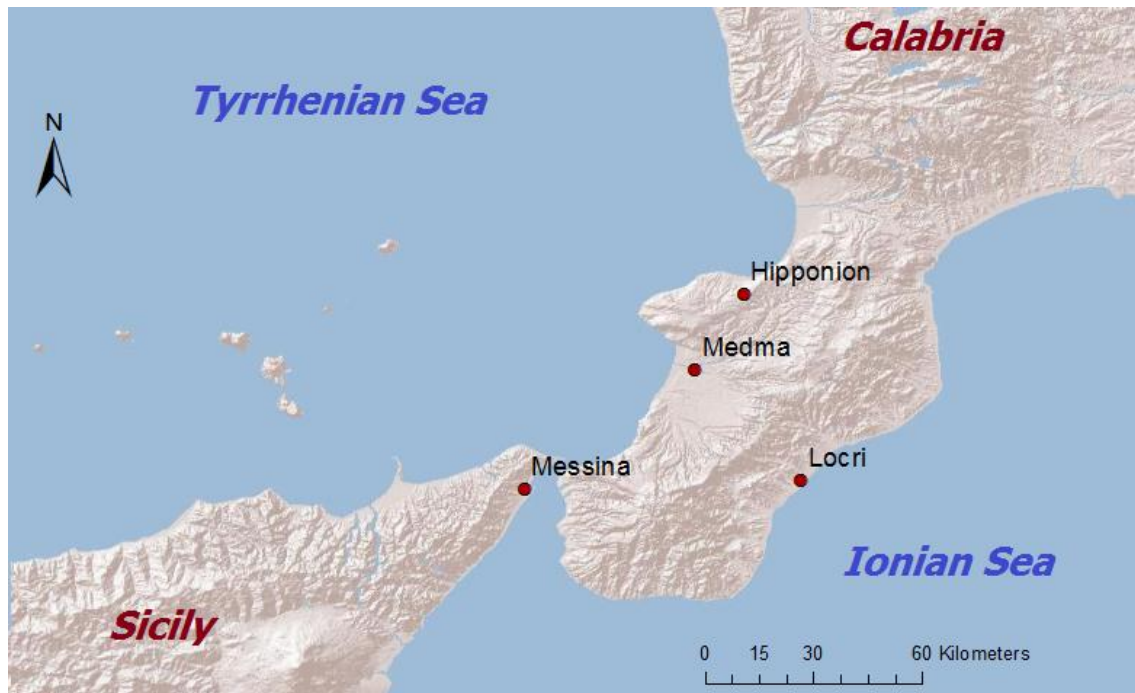
Figure 38. Locri, its rival city Messina, and its colonies Medma and Hipponion. The later will be renamed Vibo Valentia under Roman rule.

Later on, however, the Locrians forged a marriage alliance with Dionysius I of Syracuse, who reconquered Hipponion and returned it to Locrian control. However, the local ethnic group of the Bruttians subsequently captured the site of Hipponion and retained it until Agathocles recaptured it and used it as his base of operations against the Bruttians themselves. The sources do not seem to mention any relationship between Locri and Hipponion at the time of Agathocles (317 BC – 289 BC), but an inscription from Delphi (FD III 1:176, dating ca. 280 BC) advocates the continuity of relations, something that would justify Hipponion being considered as an ἐπίνειον/epineion. Alternatively, the ἐπίνειον/epineion condition could be one such as in the case of Athens-Piraeus, i.e. not necessarily relating to a faraway capital, but because Hipponion / Vibo Valentia was a short distance from the coast. Textual sources do not seem to make a difference in this respect, whether the condition of ἐπίνειον/epineion is based on political suzerainty or on sheer geographical features. It is difficult to argue that Vibo Valentia was an ἐπίνειον/epineion of Rome, since Strabo emphasises the situation of the port specifically at the age of Agathocles.

Indeed, Strabo, 6.1.5 clearly states that Hipponion has an ἐπίνειον/epineion and that Agathocles *arranged* it (ἔχει δ' ἐπίνειον, ὃ κατεσκεύασέ ποτε Ἀγαθοκλῆς ὁ τύραννος τῶν Σικελιωτῶν κρατήσας τῆς πόλεως.). This is shocking: clearly, the whole purpose of founding Hipponion was that Locri could get access to the Tyrrhenian Sea while

avoiding the strait of Messina (Ferro, 2008). Since that was the case, would they not have constructed a port when they first founded the city? Doubt is cast upon this text as Strabo seems to refer to the ἐπίνειον/epineion as a satellite *military* port. Indeed, Agathocles reconquered the port town of Hipponion to use it as a base of operations on the Italian mainland against the local Bruttii. Nevertheless, all of the original literature reviewed for this thesis mentions ἐπίνεια/epineia in relation to bigger towns or regions, not in relation to military facilities – and this in spite of the clear bias of the historical chronicles to record war-time events. Use of the verb κατεσκεύασέ ('prepared', rather than 'built') suggests that Strabo took it for granted that the port was already there, but that Agathocles added some infrastructure to it.

Unfortunately, the literary sources, as a general rule, do not tend to record infrastructure or facilities. Consequently, it is difficult to imagine how Agathocles would have improved the existent port in order to make it specifically his subject port. Diodorus Siculus (books 19 and 20) is not helpful in this respect, especially as his narration of Agathocles seems to be highly idealised.[354] The *Fragmenta Historicorum Graecorum* do not provide any substantial data either.[355] Caesar, *Civil War*, 3.101 only states that his fleet was split in two groups, one of them staying at Vibo.

Archaeological research proves more efficient for the solution of this problem. Physical remains confirm that renovation works were carried out during the age of Agathocles,[356] although some of the finds of Sicilian influence are prior to that. For example, the architectural terracotta finds known as *tetti* are estimated to date between the 5th or 4th century BC (Barello, 1989). More significantly, recent archaeological surveys, both underwater and on land (Iannelli et al. 1992) demonstrate a number of port structures, including moles, numerous pottery fragments, and villas dedicated to the fishing industry. Some of these structures do date back to the time of Agathocles. Owing to the extensive territory where finds have been discovered, Iannelli et al. (1992, p. 23) suggest that there may have been two ports: one that is more ancient, and had been used since prehistoric times, and one that was more modern, built on purpose by Agathocles in the 3rd century BC. These ports would also have the characteristic that the one would offer shelter against wind blowing from north-east, the other would protect against winds from the north-west.

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[354] Simonetti Agostinetti (2008).

[355] But cf. FrHG 2.479, corresponding to Athenaeus, *Deipnosophistai*, 12.59, reporting about some water ducts.

[356] Ferro (2008); Barrello (1989); Iannelli et al. (1992).

In this way, Strabo's text becomes clear in that it was not fully explicit: Hipponion / Vibo Valentia used to have one port, of which he does not tell us about, while a second port, an ἐπίνειον/epineion, was built in the conquest by Agathocles.

The only issue to confirm this theory is that, to my understanding, the area lacks systematic archaeological excavations, as only surveys have been carried out. Iannelli et al. (1992) provide precise locations for the port sites in the area of San Nicola and Trainiti, and Punta Safò, although the coastline has moved since antiquity. Given the richness of the observations up to date, I belive that systematic excavations on that site would be greatly desireable. The locations discussed are shown in Figure 39:
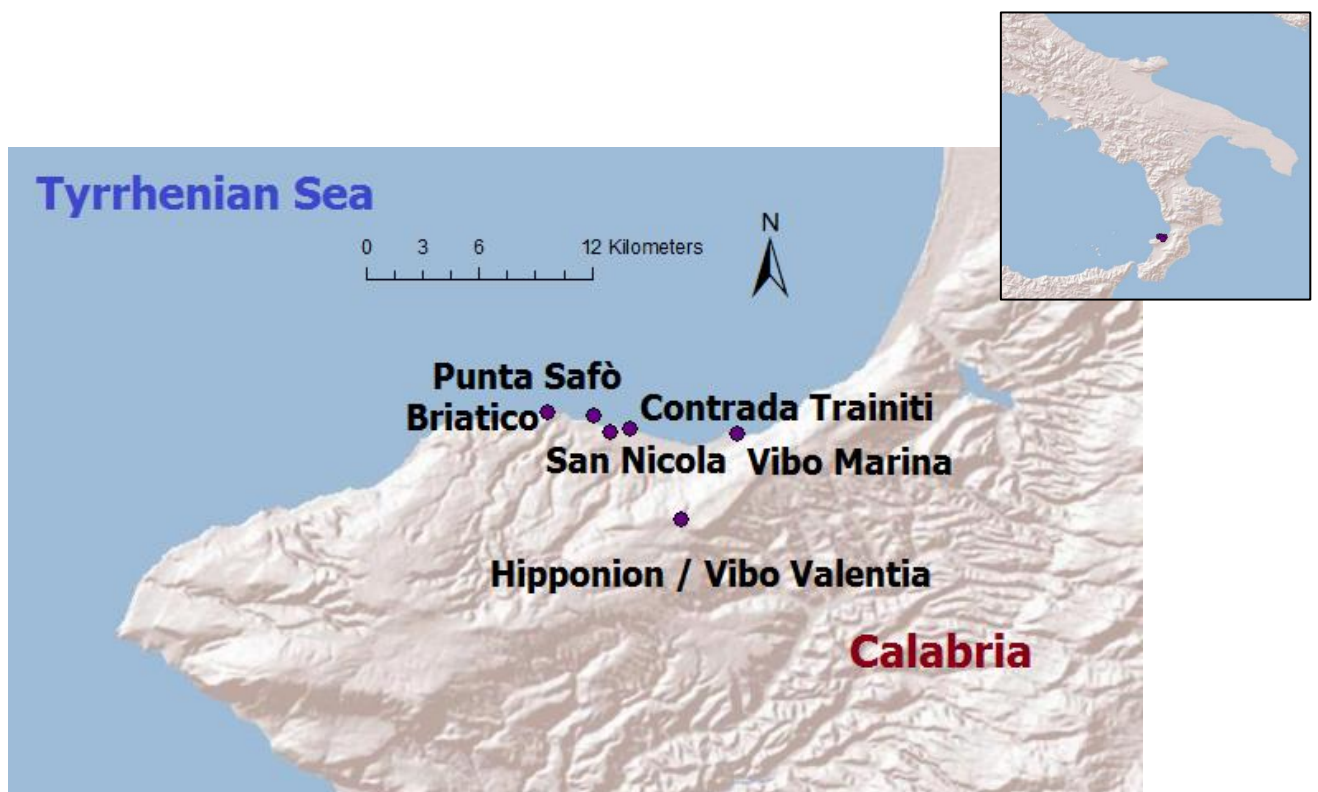
Figure 39. Harbour area of Vibo Valentia

Additionally, a linguistic problem is posed on the validity of the sources in the long term. For the area of Hipponion and Medma, and of Calabria in general, Strabo makes use of very ancient materials, of Hellenistic age or even before that, as we can see from the events he narrates. So Hipponion could have been an ἐπίνειον/epineion in terms of its wider relation to the neighbouring territory, but Strabo states specifically that it was the work of Agathocles, suggesting that the domain condition applies in relation to Syracuse during the

period of their conquest. It is unclear how long the political domain (i.e. the Sicilian connection) that caused the port to be an ἐπίνειον/epineion may have lasted, but a final date would be with the Roman conquest of Syracuse in 212 BC, because at that point there was probably no need for the Romans to maintain the port in relation to Sicily instead of for their own benefit. Strabo, however, was writing ca. AD 23. In this case, it seems he did not modify his original source when he calls the port of Vibo Valentia an ἐπίνειον/epineion. Is it because the term was still valid, perhaps in that there was some physical distance between the port and the city proper? Or is Strabo's inaction simply due to his respect for an authoritative source? While the latter option seems more likely, one cannot help but wonder if Strabo would still consider that the port was an ἐπίνειον/epineion had he visited the city in person.

5.2.2.2 Rouskiane

The word ἐπίνειον/epineion survived in writing until at least the the 6th century AD, when Procopius makes use of it, for example in *Gothic Wars*, 7.28.8 when he refers to Rouskiane (present-day Rossano in Calabria). In that pasage, Procopius follows the itinerary of Belisarius. Belisarius intends to make for Tarentum, but due to bad weather he is forced to stop at Croton. They find, however, that there are no supplies in Croton, so Belisarius sends emissaries across the mountains to get help from Rouskiane, the ἐπίνειον/epineion of Thurii. Thurii was the colony rebuilt on the ancient site of ancient Sybaris after its destruction by Croton in mid-5th century BC.[357] As shown on Figure 40, Thurii and Rouskiane are situated on oposite sites of the same bay. Therefore, it was advantageous for Thurii to have Rouskiane as its ἐπίνειον/epineion in order to control the whole space.

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[357] Cf. Gradilone (1967 : 13-37); Lenormant (1881 : vol. 2; esp. pp. 112-113). In light of this and other textual evidence, the statement by Lehmann-Hartleben (1923 : 48) that Sybaris did not have its own port is rather shocking.
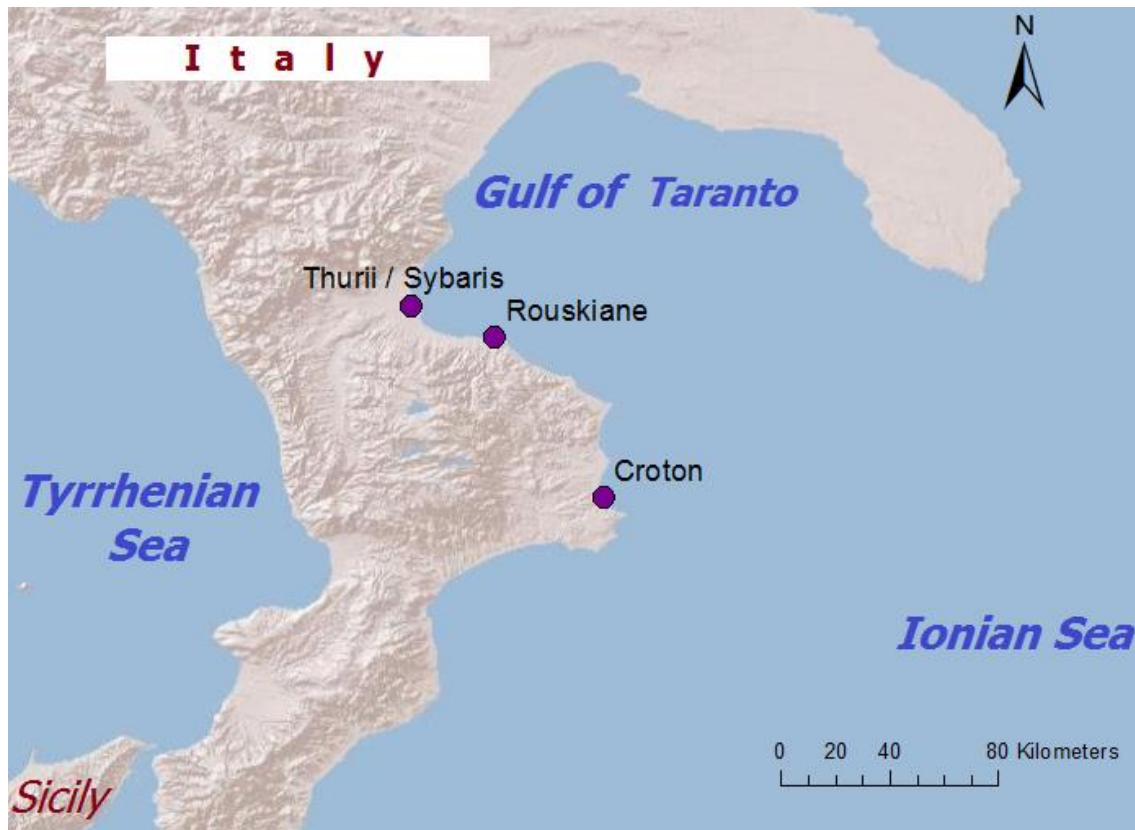
Figure 40. Locations of Croton, Rouskiane and Thurii

In this sense, Gradilone (1967 : 19), argues that Rouskiane would have provided a line of defence in a more advanced position in respect to Sybaris/Thurii, but that the relationship between the two was not a federation (*sympoliteia*) like that existing between Sybaris and Siris, but was instead a relationship of domain. In this sense, Gradilone (following Pais) concludes that the figure of 300,000 Sybarites fighting against the Crotonians (Strabo, 6.1.13) is exaggerated for the city of Sybaris itself, and that therefore the rest of the fighters were not federate, but subjects. This confirms the condition of ἐπίνειον/epineion, or vassal port, of Rouskiane. Gradilone does not elaborate, but his reasoning is plausible because textual sources, either literary or epigraphical, tend to name the allies of the cities by name. Therefore, if the name of the city does not appear, it is because the ἐπίνειον/epineion was considered an extension of it. Yet the comparison of this with the case of Hipponion above raises the question as to what extent was an ἐπίνειον/epineion subjected to or independent from the main political centre. Unfortunately, this is enormously difficult to elucidate at this point, perhaps the answer might even be that it depends on each case, or on a vast multiplicity of factors. Particularly, one wonders if distance played an important role:

compare Athens-Piraeus (the Long Walls were 6 km in length) and Pergamon-Elaia (ca. 30 km).

It is unclear from the text of Procopius, though, if there was still some kind of administrative dependence of Rouskiane from Thurii in the 6th century AD or whether it was simply referred to as an ἐπίνειον/epineion by habit. For comparison, *quattuorviri iure dicundo* are attested both in Copia (the Roman name of Sybaris / Thurii), and in Rouskiane, in the inscriptions *AE* 1996, 462 and *CIL* 1, 3163a (=*AE* 1974, 297) respectively.

5.2.3 Medma: ἐπίνειον, ἐμπόριον, and ὕφορμος

The site of Medma is particularly interesting, as it allows us to compare three terms: ἐπίνειον/epineion, ἐμπόριον/emporion, and ὕφορμος/hyphormos. Medma (present-day Rosarno in the province of Reggio Calabria) was another colony of the Locri Epizephyrii, founded some time before Hipponion in the 6th century BC. Again, the reason for the new foundation was that the Locrians wanted to have access to the Tyrrhenian Sea, while avoiding the strait of Messina – either because the sailing passage was dangerous, or because it was otherwise controlled by the Sicilian elites. The mountain passages of Passo della Liminia and Passo del Mercante, potentially also those of Croce Ferrata and Ropola, afforded an easy land access across the peninsula from Locri to Medma, with an estimate duration between half a day and one day of journey.[358]

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[358] Visonà (2016), cf. Sia (2014).
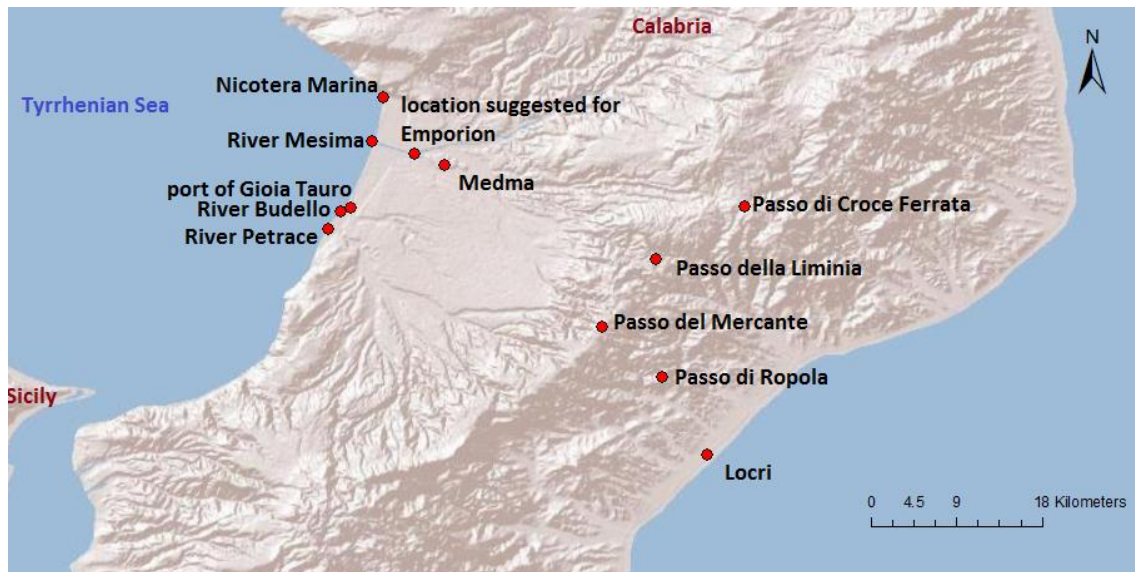
Figure 41. Medma: its connection with Locri and the possible locations of its ports

The port system of Medma is documented in Strabo, 6.1.5, who relates it to a water spring, and states that it has nearby an ἐπίνειον/epineion called Emporion. He also says that in the proximity there is the river Metaurus[359] with an ὕφορμος/hyphormos of the same name, potentially also used by Medma, thanks to its proximity. There is, however, a great problem mapping the text with the reality in the investigations carried out so far.

First of all, I would like to highlight some issues that have already been noted in relation to this "Metaurus". The text of Strabo reads that a river called Metaurus flows near Medma, and that a second river, also called Metaurus, flows somewhat farther. There clearly is a textual problem in the manuscript tradition here. The river presently known as Mesima would be the first Metaurus, while the second Metaurus would be a river discharging near Gioia Tauro, possibly the present-day Fiume Budello or Petrace. Whether the river flowing through Medma, which harboured the ὕφορμος/hyphormos, was called Metaurus or was eponymous to the city instead is open to discussion. Previous editors, like Kramer and Meineke, believe that the original name of the river was Medma, but that at some point during the textual tradition it was swapped to Metaurus by mistake, and that then the adjective ἕτερος was added to avoid confusion.[360] Jones, however, believes that the ἕτερος was already there in the first place in order to differentiate this Metaurus from the one in the north of Italy that Strabo himself had quoted in 5.2.10, something that at some point

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[359] Not to be confused with the Metauro river flowing through the Toscana and the Marche regions.
[360] Cf. Rix (1951-1952). Some ancient authors, like Ps.-Scylax, use the orthographic variant Mesma.

the copyists would not have understood, and would have tried to solve by naming the river of Medma as Metaurus. To avoid confusion, I am referring here only to the river flowing next to Medma. The latter river, which probably discharged in the area of the present-day industrial port of Gioia Tauro, is not relevant for the discussion here.[361]

There is no problem with the superposition of the terms ἐπίνειον/epineion and ἐμπόριον/emporion, for they refer to two different functions. The former is an indicator of politico-administrative dependence (after all, Medma is located ca. 5 km inland, not to mention that it was founded as a satellite of Locri), while the latter denotes that the port was used for trade. But Strabo suggests that Medma had both an ἐπίνειον/Emporion and an ὕφορμος/hyphormos in different locations. But where were these ports?

Researchers have searched for the ἐπίνειον/epineion called Emporion near the spring, whereas the ὕφορμος/hyphormos is believed to be on the river Mesima. Attempts to identify this κρήνη are not conclusive to this date. Online maps and gazeteers, like the Digital Atlas of the Roman Empire, Pelagios's Peripleo, and Pleiades, all place Emporion on the river, next to Medma / Rosarno, as shown in Figure 41 above. They provide no justification for this, and personally I suspect it is solely because this is the location provided by the Barrington Atlas.[362] A reason for that might be that in the archaeological campaign of 1927, Paolo Orsi attempted to find the location of the port on the valley in that area. While he did confirm that it was inhabited in ancient times (there were plenty of finds of terracota), no port structures at all were discovered.[363] The port was sought in that area because there is a water source called Testa dell'Acqua but, to my knowledge, nothing that unequivocally demonstrates the location of the port has been found so far. In addition, Strabo's exact clause is πλησίον ἔχουσα ἐπίνειον καλούμενον Ἐμπόριον ("it has an epineion called Emporion nearby"). Researchers try to pair the participle ἔχουσα ("it has") with the spring of water (κρήνη). However, this participle is in the nominative, and therefore, owing to its adjectival function, it is in fact coordinating with the other nominative in the sentence, namely Μέδμα πόλις. In other words, what Strabo says is that

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[361] Jones, in the notes to his translation, identifies this second river as the Marro. I have not been able to locate this toponym by looking at present-day maps (note that Jones's translation dates back to 1924). The location of this river, however, would be consistent with the Budello, or potentially with the Petrace, somewhat further south.

[362] Barrington Atlas, 46, C5. On the other hand, maps and gazeteers available online should have the technical resources to provide more information than that contained in a geographical illustration. In my opinion, users would be particularly interested in knowing whether or not ancient archaeological remains have been found on site. There is, therefore, potential to develop these tools to a better level.

[363] For details on the topography and excavations, Paoletti and Settis, 1981.

the city of Medma has an ἐπίνειον/epineion nearby, not that this ἐπίνειον/epineion is next to the fountain (κρήνη is in the dative case). The port could just as easily be on the sea. One is therefore tempted to think that archaeologists have been searching in the wrong location and that new research with present-day technology is needed.[364] The site of present-day Nicotera Marina has been suggested at some stages to be the ἐπίνειον/epineion of Medma. I think this is complicated: if the Locrians wanted an access to the Tyrrhenian in the first place, why would they found the port ca. 10 kilometres apart from the new town? Research published up to today does not provide enough justification or supporting evidence for this suggestion.[365] However, it would not be impossible that Nicotera Marina acted as the ἐπίνειον/epineion: a new survey of the coastline near Medma is urgently needed.

As for the ὕφορμος/hyphormos on the river, the Mesima / Metauros was navigable during the 1st century AD, so it would have made sense to situate the port on it because it would have been more sheltered and closer to the town proper. The river, however, changed course throughout time (Schmiedt, 1981). So in a manner complementary to the ἐπίνειον/epineion, Medma may have had an ὕφορμος/hyphormos on the river, using the river as a waterway to bring cargoes closer to the city, in a similar manner to Ostia and Portus in relation to Rome by means of the Tiber.[366]

5.2.4 Brundisium: the ὅρμος near the port

A very illustrative example of the expectable λιμήν/limen - ὅρμος/hormos relationship is Brundisium.[367] Cassius Dio, 41.48, details an episode of the Roman Civil Wars when Libo makes an attempt to attack Brundisium. At one point, however, he becomes in dire need of anchorage and drinking water (ὅρμου καὶ ὕδατος) and has to leave, as he cannot enter the port at Brundisium because Antony is preventing him, and also he cannot anchor on the island offshore of Brundisium because it offers neither anchorage nor water. Libo sailed

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[364] I have found no further bibliography for the port than books and papers from the decade of the 1980's, all focusing on the spring.

[365] Cf. Schmiedt (1981), with a map on p. 45.

[366] My conclusions are based upon evidence based published in the 1980s, itself largely based upon Orsi's work of the 1920s and 1930s, and they therefore exclude any work has been undertaken more recently. Multiple attempts were made to contact the local archaeological authorities, particularly the Beni Culturali, to enquire about these excavations, but they could only confirm that there were none more recent. This section, however, would benefit from newer excavations if it was possible to carry them out in the future.

[367] For an overview of the coastal morphology in the Adriatic coast of Puglia: Lamboley (1996 : 299 ss). For the port of Brundisium: Sciarra (1985) and Uggeri (1988). For an exhaustive study of the ancient ports at the Salento region Auriemma (2004) esp. vol. 2 for the maps.

further up the coast "where he found both", anchorage and water. Therefore, Brundisium was the larger λιμήν/limen in that area but there was at least one ὅρμος/hormos nearby where it was possible to anchor, particularly when in distress, and obtain drinking water. It is not possible to find the location of that ὅρμος/hormos from Cassius Dio alone, particularly as the text only states that Libo sailed off a little farther (ἀπέπλευσε πόρρω ποι), without specifying what direction or the characteristics of the place where he landed, other than it provided anchorage and drinking water.

Caesar, *Civil War*, 3.24 is no more explicit in this respect: his chronicle records only that Antony prevented Libo from taking water and as a result Libo sailed away. In its description of the area around Brindisi, Pliny's *Natural History* 3.101-103 presents some problems with the geographical identification of some of the towns, and is not helpful for the purposes of this investigation. The *Tabula Peutingeriana* is of great help: north of Brindisi, the *Tabula* shows a site named Spelunis, identifiable with present-day Torre Santa Sabina.[368] The neighbouring coast hosts a large number of bays, and it is reasonable to think that one of those could have constituted the ancient ὅρμος/hormos referred to in the texts above. In addition, if Libo was sailing back to Dyrrachium, present-day Durrës in Albania, it is more likely that he would have coasted Italy to the north of Brundisium, rather than to the south, in order to take drinking water. Figure 42 shows these locations:

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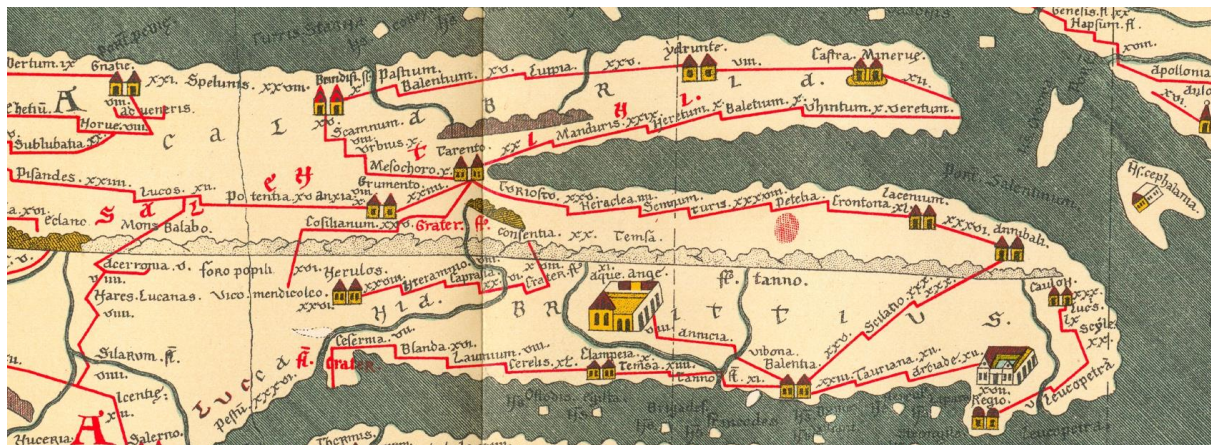
[368] For an edition of the Tabula Peutingeriana, Miller (1962). For a superposition of the locations in the Tabula with a present-day map, omnesviae.org (last accessed 26th July 2017). For a commentary on the Tabula, particularly on the Germanic regions, Albu (2014). For Torre Santa Sabina as a port: Auriemma (2004 : 66 ss., esp. pp. 68-76).

Figure 42. Tabula Peutingeriana: detail of Brundisium and Spelunis / Torre Santa Sabina. Source: reproduction of the copy by Konrad Miller (1887), http://www.doria.fi/handle/10024/90222, accessed: 31st July 2017
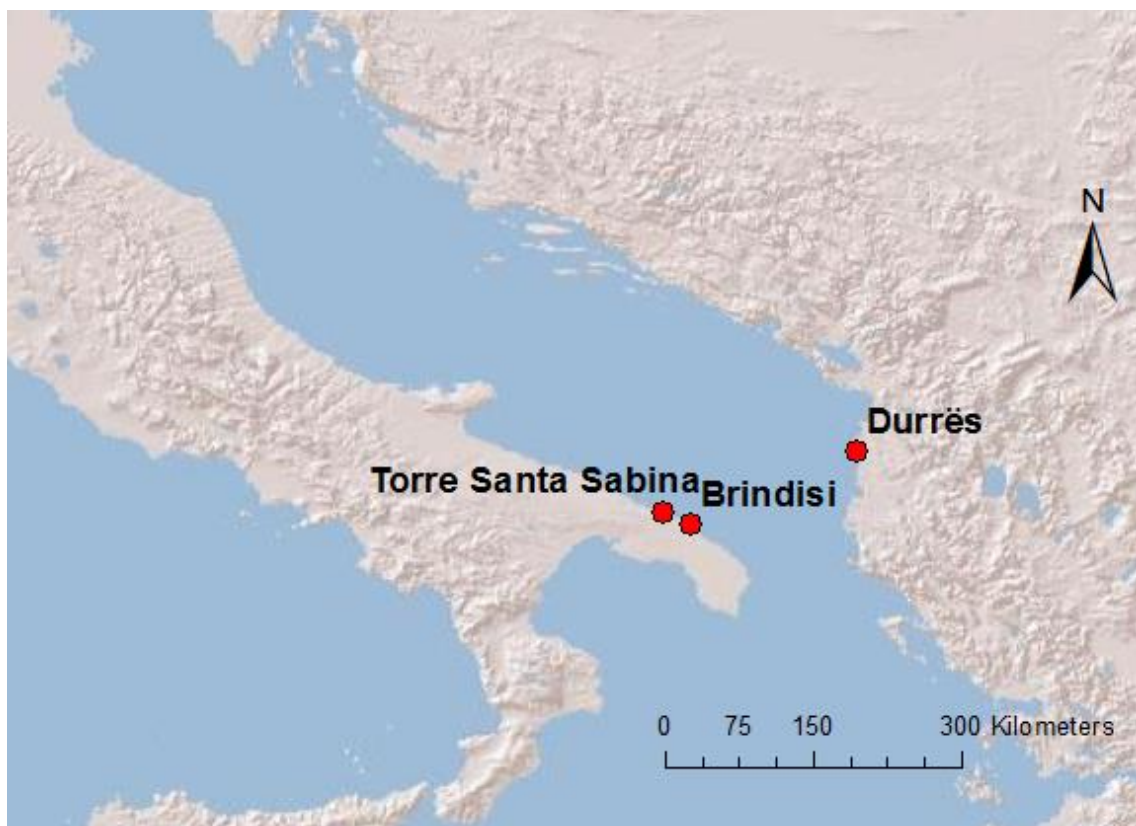
Figure 43. Torre Santa Sabina, the possible location of the ὅρμος /hormos near Brundisium

Would those coves have been close enough to Brundisium so as to relate that ὅρμος/hormos to that city? The ancient periploi mark the connections between the harbours in terms of stadia, which depend on the distance covered by a sailing ship in a day, which is imprecise. If the hypothesis above is correct, one should expect that the sailing time between Brindisi and Torre Santa Sabina is rather short. From Brindisi to the coves in the area of present-day Torre Santa Sabina, there are 25-30 km by sea, or 13-16 nautical

miles. One must pause here before estimating sailing times. Sailing conditions depend on a number of factors: most importantly, the winds, but also how heavy or light the ship was so that it was able to move faster or slower, and coasting is known to be slower than travelling on open waters. The rig plan and the form of the hull also played a role in the sailing efficiency, together in combination with the state of the sea.[369] In the case of war fleets, the issue of rowing also deserves consideration, although Casson believes fleets would have relied mostly on sails, reserving the use of oars only when they were in battle or emergency: rowing, he states, is a «short-lived power».[370]

Casson (1951) provides the following estimate speeds:

	favourable winds	unfavourable winds
average ships (open waters)	4-6 knots	less than 2-2.5 knots
average ships (coasting)	2-3 knots	*(no estimate)*
war fleets[371]	2-3 knots	1-1.5 knots

More precisely, Whitewright (2011 : 9-10) calculates speeds of 4.4 knots in favourable winds for square sail ships or 1.8 knots in unfavourable winds. Estimates for ships with a lateen sail are respectively 4.5 or 1.4 knots. The predominant winds for Brindisi are the following:

Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant wind direction													
Wind probability >= 4 Beaufort (%)	37	45	46	42	40	39	38	38	35	30	36	40	38
Average Wind speed (kts)	10	11	11	11	11	10	10	10	10	9	10	10	10
Average air temp. (°C)	11	12	14	17	21	25	28	28	25	20	16	13	19
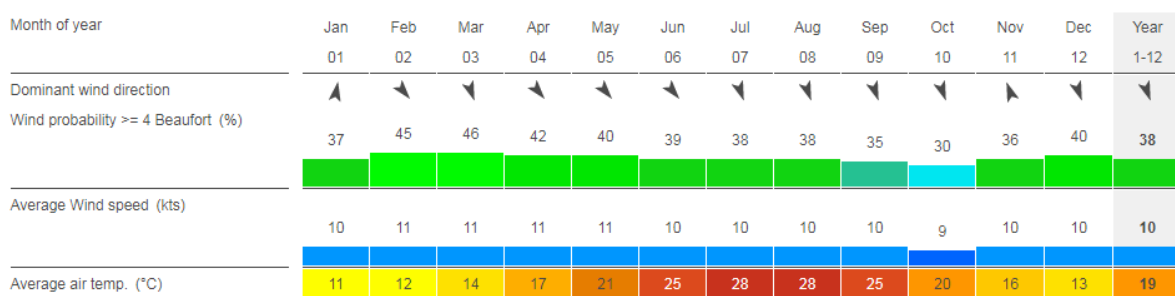
Figure 44. Predominant winds in Brindisi as recorded between October, 2000 and June, 2017. Source: https://www.windfinder.com/windstatistics/brindisi, accessed 27th July 2017

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[369] For details on the factors that could favour or hinder the speed of ancient ships: Casson (1951), Whitewright (2011).

[370] For further discussion and estimates on speed of the ancient sail ships: Casson (1951), Whitewright (2011), Leidwanger (2013). For further models and a more comprehensive discussion, Warnking (2016).

[371] Casson does not state explicitly whether the war fleet estimates relate to open waters or coasting. However, I would expect that the estimates are relative to navigation on open waters out of the context of his paper. Cf. also Shaw (1993 : esp. 39-47) for experimental voyages with a reconstructed trireme.

The exact date of Libo's attempt on Brindisi is not known, but the main action was taking place since the 10th of July 48 BC. Accepting the hypothesis that the wind regime was similar as in the modern age[372], Libo's fleet would have been sailing from Brindisi to the area of Torre Santa Sabina with contrary winds: he would have been sailing north with winds blowing towards the south or south east. Considering this, the estimate sailing times are those indicated in the following results:

1 knot = 0.514 m/s

rough estimate for distance between Brundisium and Ad Speluncas: 26 000 m

speed with contrary winds, estimate Casson: 1.5 knots

speed with contrary winds, estimate Whitewright: 1.8 knots

estimate knots x 0.514 m/s = k m/s

distance : k m = y s

y s = y*h

note: minutes have been rounded in the final results

	estimate Casson	estimate Whitewright
short distance	9 hours 20 minutes	7 hours 45 minutes

That is, however, the worst-case scenario. Libo could also have had favourable winds and it could have been a 3-hour sail. To this effect, it would also be interesting to know what time Libo was sailing, as he could have benefitted from the effect of diurnal winds. The ancient sailors, as still today, used the effect of diurnal winds to leave port in the early morning, and to sail into the port in the evening.[373] Unfortunately, the extant texts are not very explicit.

To sum up, under contrary winds it would have taken a third of the day to sail from Brundisium to this ὅρμος/hormos. That might seem a very long time, but Spelunis was probably the closest point to get what they needed – in this case, water. Spelunis is also a very suitable candidate to house the ὅρμος/hormos for other reasons. That area has a

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[372] Cf. Murray (1995).
[373] Semple (1931 : 582, 624).

number of springs, where Libo and his fleet could have obtained fresh water, which was the reason for him to leave Brundisium according to Caesar and to Dionysius of Halicarnassus.

The zone is also known to have hosted human presence since the Neolithic to the Middle ages. In fact, the area received the name Ad Speluncas during the Roman period, when a network of road stations (*mansiones* in Latin) was established to facilitate travel between main cities, in order to use them as stopovers to cater for the logistical needs of the journeys. Important archaeological structures have been found around the *mansio Ad Speluncas*, including two wrecks of Roman ships, probably dating to the Late Republic or 1st century AD (Auriemma et al., 2005). This proves that the area was already active as a port at least during the period of Libo, but, since it was only a stopover point – and therefore not the intended destination–, Dionysius names it as an ὅρμος/hormos and not as a λιμήν/limen.

5.2.5 Tarentum, Kallipolis, Siris and Fratuentium

Examples of towns that have more than one ἐπίνειον/epineion are less frequent or less explicit but still relevant. At least in Apulia, relations between coastal towns and other centres, usually somewhat inland, seem to be the norm since at least Messapian times.[374] To illustrate this issue, Tarentum (Taranto) proves to be an important site, as the textual sources describe three other port towns that were dependent upon it:

1. Kallipolis,[375] in Dionysius of Halicarnassus, 19.3.1: Καλλίπολιν ἐπίνειόν τι τῶν Ταραντίνων ('Callipolis, a certain *epineion* of the Tarentinians).

2. Siris, in Strabo, 6.1.14. According to Strabo, Siris was a port town on the river of the same name. It was a Greek colony, although archaeology has shown, mostly from burial evidence, that there were already native inhabitants on the site before the Greeks arrived.[376] Siris came subsequently under the domain of Heraclea and of Tarentum, thus becoming a satellite port.

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[374] Cf. Lamboley (1996) and Auriemma (2004). Specifically for the historical problems of the route Tarentum – Brundisium, see Lombardo (1989).
[375] Pliny, *Natural History*, 3.100 reports that Kallipolis was later re-named Anxa: *Callipolis, quae nunc est Anxa, LXXV a Tarento*; 'Callipolis, which is now Anxa, 75 (miles?) from Tarentum'.
[376] Cerchiai et al. (2002 : 122-129, esp. 125-126).

3. Fratuentium, in Pliny, *Natural History*, 3.101: *dein Fratue<n>tium, portus Tarentinus*, ('next is Fratuentium, a Tarentine port').[377]

The locations of the ports are shown in the map. Note that the exact site of Fratuentium is not known, but based on Pliny's description it must have been somewhere between Otranto and Brindisi.

Figure 45. The ἐπίνεια/*epineia of Tarentum*

Control of these three diverse points granted to Tarentum one fundamental advantage, namely geographical security, for the trade of this city, especially famous for its wool exports and for its role in the redistribution of goods around the area.[378] Fratuentium was

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[377] Some scholars, like Lamboley (1996), have trouble with this passage. As the editors usually place a comma between *Fratuentium* and *portus Tarentinus*, their interpretation is that these are two separate entities. However, I believe that *portus Tarentinus* stands in apposition to the toponym, i.e. it is a clarification, the intended meaning being: "Fratuentium, a port that belongs to Tarentum". I believe that *Fratuentium* is the *portus Tarentinus* on the grounds that *Tarentinus* is clearly an adjective and this lexical construction is analogus to other passages where Latin authors refer to ports (cf. Caesar, *Civil War*, 1.26, *portu Brundisino*; Livy, 25.25, *portu Syracusano*; Pliny, *Natural History*, 9.14-15, *portu Ostiensi*), although it is true that the Latin literature does not record a phrase of this type with the actual port so far away from the place designated by the toponym. In other words, the use of the adjective implies belonging to that place, not being a separate entity (one could only argue for Pomponius Mela, 3.4: *portus quem Gaditanum adpellant*, but this is only Mela's way of indicating that the surrounding area is called Gades, and does certainly not imply that the *portus Gaditanus* is a separate entity to *Gades*). And while constructions with personal names or names of gods are usual (e.g. *Portus Orestis* in Pliny, *Natural History*, 3.4), I am unable to find similar examples with adjectives deriving from cities' names. Not to mention that, if Fratuentium and portus Tarentinus were two separate entities, we would have the problem of too many unidentified sites in that area.
[378] There is much bibliography on textile production in antiquity, but see esp. Mele (1997) and Morel (1978). More generally, see Lamboley (1996 : 420), and Auriemma (2004).

on the Adriatic, so for ships sailing to and from that route, it may have been feasible (and perhaps shorter) to bring the merchandise overland. The last stretch of the Via Appia connected Tarentum with Brundisium, and the route Tarentum-Otranto is well documented.[379] Fratuentum is thought to lie somewhere near the latter.[380]

Instead, Kallipolis and Siris/Heraclea both faced the same sea as Tarentum, lying at different sides of the gulf of the same name. Aside from the political and economical advantages, Kallipolis (Gallipoli) was a geostrategic place to control. However, further information on the historical relationship of Kallipolis with Tarentum is needed, especially since archaeological documentation puts Kallipolis in relation not with Tarentum, but with present-day Alezio, which lies roughly 7 km inland from the harbour town.[381]

Yearly wind regime statistics for present-day Gallipoli show that, depending on the month of the year, winds tend to blow from the northern or southern direction, with the predominant yearly winds blowing towards the south.[382] Assuming that it was the same in antiquity,[383] there would be roughly six months of the year when ships coming from the south (e.g. from Greece or from Africa) would encounter adverse winds in their coasting of Apulia up to Tarentum, and they would have had to tack.[384] It would therefore be convenient to have a fore-port like Kallipolis for those periods when the journey up to Tarentum would have been long and arduous. Kallipolis would also have provided a suitable point for watering and for taking victuals to ships entering the Gulf of Taranto, perhaps also for changing to overland transport if winds were too unfavourable.

As for Siris, the wind statistics that I have found are not specific enough.[385] However, winds on that route do not seem particularly unfavourable, judging by the statistics at nearby locations of Marconia and Marina di Ginosa. Assuming a similar regime in antiquity,

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[379] Cf. Lamboley (1996 : esp. 323 ss.), with p. 329 suggesting that if one encountered contrary winds around the area of Otranto, it was probably easier to take the land route to Tarentum than to try to sail around the Apulian peninsula. Auriemma (2004) provides less discussion on this aspect.

[380] For discussion on the Via Appia particularly between Tarentum and Brundisium, Uggeri (1977).

[381] Cf. Lamboley (1996) and Auriemma (2004).

[382] https://www.windfinder.com/windstatistics/gallipoli. Accessed: 28th July 2017.

[383] Good evidence for that is presented by Murray (1995) with a focus on Cyprus.

[384] Note, however, that the specific angle when winds become unfavourable depends on every type of ship.

[385] https://www.windfinder.com/windstatistics/marconia?fspot=marina-di-policoro. Accessed: 28th July 2017. The closest statistics that I have been able to find correspond to Marconia, about 30 km away (and, crucially, inland). In Marconia, the unanimous tendency throughout the year is for winds to blow in a south-east direction. However, the winds in Marina di Policoro, the location closest to ancient Siris, were blowing towards the north for most of the day on 28th July 2017, and the tendency was expected to continue for the next couple of days. And still, comparing this data with the yearly statistics from Marina di Ginosa, which is situated halfway between the ancient site of Siris and Tarentum, shows a general tendency for winds blowing towards the east or slightly south-east.

winds would probably not have represented an important factor in the will of Tarentum to control the site of Siris, like it seems to be the case for Kallipolis. Economic advantages, like the extraction of tax, would have been more decisive. In this respect, compare Polybius, 10.1 where he states that Tarentum was used as the ἐμπόριον/emporion for that region because Brundisium had not yet been founded, and thanks to its favourable port. It would certainly have reinforced its territorial authority for Tarentum to have a network of subject ports in advance to facilitate the traffic of merchandise.

In this section, two issues have been seen. Firstly, at Alexandria, how one same port can be named by different terms depending on the emphasis of the speaker. Secondly, in sourthern Italy, the port networks established in Antiquity: the satellite ports of Locri into the Tyrrhenian sea, the advanced port in Rouskiane in relation to its mother city Siris, the sub-anchorate near Brindisi, and the port network depending on Tarentum. The next section presents some discussion on the overlapping terminology and the input of the case-studies.

6. DISCUSSION:

LINGUISTIC PRAGMATICS AND ONTOLOGICAL INTERRELATION BETWEEN PORT FORMS

6.1 General observations

This chapter aims to explain the sense relations between the diffferent terms employed in ancient Greek and in Latin to refer to ports by comparing and combining the analyses of the data in chapters 4 and 5. As discussed in the introductory chapters, the method adopted in this thesis to compare the meanings of words is decomponential analysis. Decomponential analysis allows us to set each term in relation to the others and to establish the similarities and differences in meaning. The following figure illustrates the results from the observations carried out in the previous chapters, where the prototype for each harbour form was sought by exposing all the data available in the literary sources:

TERM	on the sea shore	on a major town	offsite	commercial	military	fishing	may co-occur with other port types	creates toponyms
λιμήν	+	+	-	+	+/-	+/-	+	+
ἐπίνειον	+	-	+	+	+/-	+/-	+	-
ἐμπόριον	+	+	-	+	-	-	+	+
ὅρμος	+	+/-	-	+	+/-	+/-	+	-
σάλος	-	+/-	-	+	-	-	+	+
ναύσταθμον	+	+/-	-	-	+	-	+	+
αἰγιαλός	+	-	-	+/-	-	+	-	-
ἀγκυροβόλιον	+	-	-	?	?	?	+	-
portus	+	+	+/-	+	+	+/-	-	+
statio	+/-	+/-	+/-	+	+ ?	+/-	-	-
litus	+	+/-	-	+/-	+/-	+	-	-

+	yes
-	no
+/-	possible either way
?	unknown

Figure 46. Decomponential analysis of the terms researched in this thesis

The second method taken for the clarification of language relations, as explained in the literature review, was a hierarchical taxonomy. However, as Ungerer and Schmid explained, taxonomies may depend on the point of view, and are not the same for every language. The following Figures 46 and 47 show the proposed taxonomies for the terms researched, firstly, the Latin terms, next, the Greek terms. Note that the words λιμήν/limen and ὅρμος/hormos are ambiguous in that they can refer to either a whole unit or a part, depending on the context. When they refer to a part, their relation is that of meronymy (with the uniting line blueish-purple on the diagram below). All other relations expressed in the diagram are separated by degree of inclusiveness. The λιμήν/limen 'port' has been chosen as a superordinate for the harbours with infrastructure because it is not infrequent that the other terms appear in apposition to it (e.g. λιμένες ναύσταθμοι / limenes naustathmoi). However, there is no similar equivalent for the other forms, a phrase like *λιμένες αἰγιαλοί/limenes aigialoi does not exist, and therefore there is a gap in the taxonomy.

However, things are not always clear-cut, and there are some more observations to add to this chapter. I will start with the commentary of the interrelations between the different Greek terms, then I will continue with the Latin terminology.
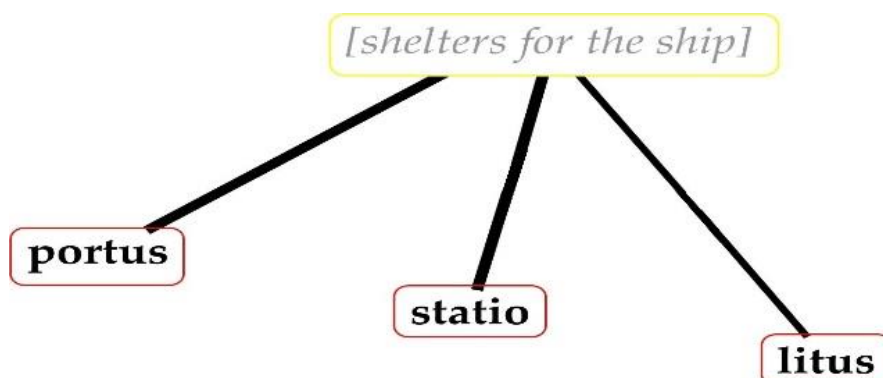
Figure 47. Sense relation of the Latin terms for anchorages

[shelters for the ships]

[no infrastructure]

ἀγκυροβόλιον ('anchoring point')

αἰγιαλός ('sea shore')

σάλος ('anchoring out to sea')

λιμήν ('port')

ναύσταθμον ('military port')

ὅρμος ('mooring place')

πάνορμος
('complete mooring place')

ὕφορμος / πρόσορμος
('less sheltered mooring place')

ἐμπόριον ('port of commerce')

ἐπίνειον ('subject port')

...our basin')

...mooring point')
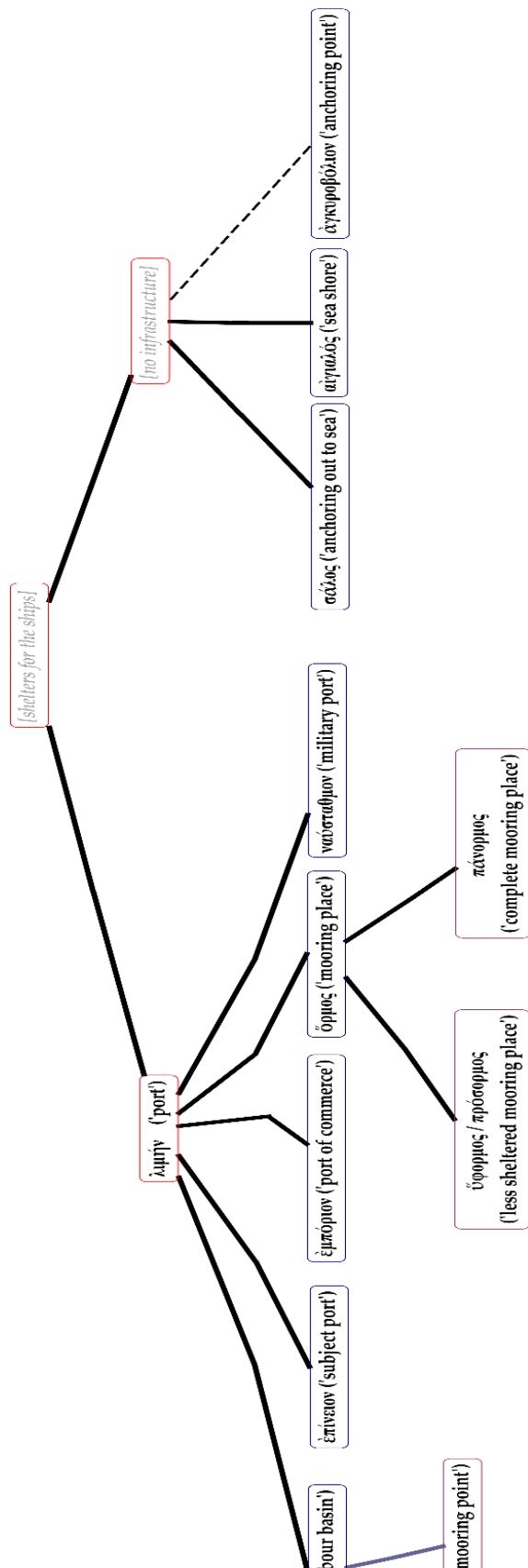
6.2 Greek terms:

Figure 48. Sense relations of the Greek terms for anchorages

6.2.1 overwiew

After extensive consultation of the Greek literature, the nouns referring to forms of anchorage identified have been the following: λιμήν/limen, ὅρμος/hormos, ἐπίνειον/epineion, ἐμπόριον/emporion, ναύσταθμον/naustathmon, αἰγιαλός/aigialos, σάλος/salos and ἀγκυροβόλιον/ankyrobolion. Ἀγκυροβόλιον/ankyrobolion never co-occurs with any of the other options, but as shown in section 4.8, the textual evidence for ἀγκυροβόλια/ankyrobolia is extremely scanty. On the contrary, all nouns or their adjectival derivates co-exist with λιμήν/limen, thus reinforcing the status of that term as a basic-level word. The rest of the anchorage modalities only interact with each other in a few cases. This is logic because each of those modalities has some sort of specific nuance that makes some of the terms incompatible with each other (but not with λιμήν/limen, which is the generic, basic-level term). The fact that λιμήν/limen is the basic-level term can be demonstrated in that it is the term chosen in order to define the others, as in Polybius, 5.102.9, for instance.[386]

6.2.2 λιμήν with ὅρμος

Λιμήν/limen co-occurs with ὅρμος/hormos with high frequency. The fact that both λιμήν/limen and ὅρμος/hormos operate on two levels (respectively: the port or a sub-basin, and an anchorage or a mooring point) may seem difficult at first, but texts are usually easy to discriminate. For example, in Chariton, *Callirhoe*, 1.11.4-2.1.9 quoted above, the ὅρμος/hormos 'anchorage' exists in opposition to the λιμήν/limen of Miletus, as the author wants to emphasise, not only the lack of physical infrastructure, but also whether it is a space protected by legality or not. In contrast, Flavius Josephus, *Antiquities*

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[386] The only issue appears when it is λιμήν itself that requires a definition. Cf. the scholion in Apollonius's *Argonautica*, p. 301 lines 9-10: ἀμφιλαφῆ δὲ τὸν λιμένα εἴρηκεν τὸν ἀμφοτέρωθεν πρόσορμον ἔχοντα, ὃν Καλλίμαχος ἀμφίδυμον εἶπεν. "he calls the *limen* 'extended' because it had a *prosormos* on either side, which Callimachus calls 'double'".

of the Jews, 15.331-332[387] explains that inside the whole complex, or λιμήν/limen, there are two sub-basins called ὕφορμοι/hyphormos, and καταγωγαί, or berths.

A more complex case is posed by Dionysius of Halicarnassus, 1.51.3. The passage narrates the disembarking of Aeneas in Cape Iapigia. The text states that he disembarked at a place which had a θερινός ὅρμος/therinos hyphormos, an anchorage for the summer season, but that it has since been called the Limen of Aphrodite. It is possible that this place was later re-named Castrum Minervae, or simply Minerva.[388] It is possible that the anchorage on that site was not a particularly good one, but that the site was named Limen as a way to honour it. Additionally, it is easier for the term λιμήν/limen to generate toponyms, rather than ὅρμος/hormos. The same case occurs in the case of Monoecus Limen, which Strabo (4.6.3) dismisses as an ὅρμος/hormos for small, few ships.

The phrase λιμὴν εὔορμος/euormos also deserves some consideration. It appears in cases like Appian, *Punic Wars*, 347,[389] referring to Utica. Again, it has to do with the mooring points within the port. While an adjective like εὐλίμενος/eulimenos would refer to the general quality of the coastline, εὔορμος/euormos shows that the facilities for mooring within the λιμήν/limen are outstanding, possibly also easy to access. In this sense, compare for example the coasts of Egypt and Syrtis, with their sandbanks, or Carthage itself, where at one point merchants were dropping anchor on the mole / χῶμα, rather than inside the harbour basin.[390]

6.2.3 λιμήν with ἐπίνειον

The two combinations that seem to present the highest frequency of co-occurrence are λιμήν/limen with ὅρμος/hormos and λιμήν/limen with ἐπίνειον/epineion. The latter is easy to explain, because it depends on the point of view of the writer. As discussed in section 4.2, ἐπίνειον/epineion is used to refer to the anchorage that is controlled by another, larger town, which is usually a little inland, e.g. Piraeus in respect to Athens, or Elaia in respect to Pergamon. But while the ἐπίνειον/epineion is always "in respect to" somewhere else, the λιμήν/limen is site-specific. For example, for a Corinthian, the maritime facilities at

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[387] 15.9.6 in other editions. Cf. also Flavius Josephus, *Wars of the Jews*, 1.408-410 (or 1.21 in other editions).
[388] The issue is that a sanctuary of Minerva or Athena has not been identified on that area and the assumption is purely theoretical. I am following the Pleiades gazeteer for this assumption, but cf. Lamboley (1996 : 236-237, 286, and text 26 in that page, 444-445).
[389] 11.75 in other editions.
[390] Cf. Appian, *Punica*, 582-587, or 18.123-124 in other editions.

Cenchreae and Lechaeum are his or her ἐπίνεια/epineia, whereas for the local citizens of Cenchreae and Lechaeum, those same facilities are their λιμήν/limen. Examples of this phenomenon include Pausanias, 2.2.3 and 7.26.14, and Strabo, 9.1.4. It is important, however to differentiate the λιμήν/limen 'harbour complex' from the λιμήν/limen 'compartment' or ' berth', as also discussed in section 4.1. This is noted in the literature in expressions of the kind "an *epineion* ('anchorage site of an inland town') having a small *limen* ('basin')", such as in Strabo, 5.2.6 and 16.2.12. Note again in the case of these two texts the lack of distinction in regards to the distance: the former describes Populonium as a town on a hill, with the ἐπίνειον/epineion harbour at the foot of the hill, while the latter deals with two entirely different towns: Carnus and its offshore island further south, Aradus.[391]
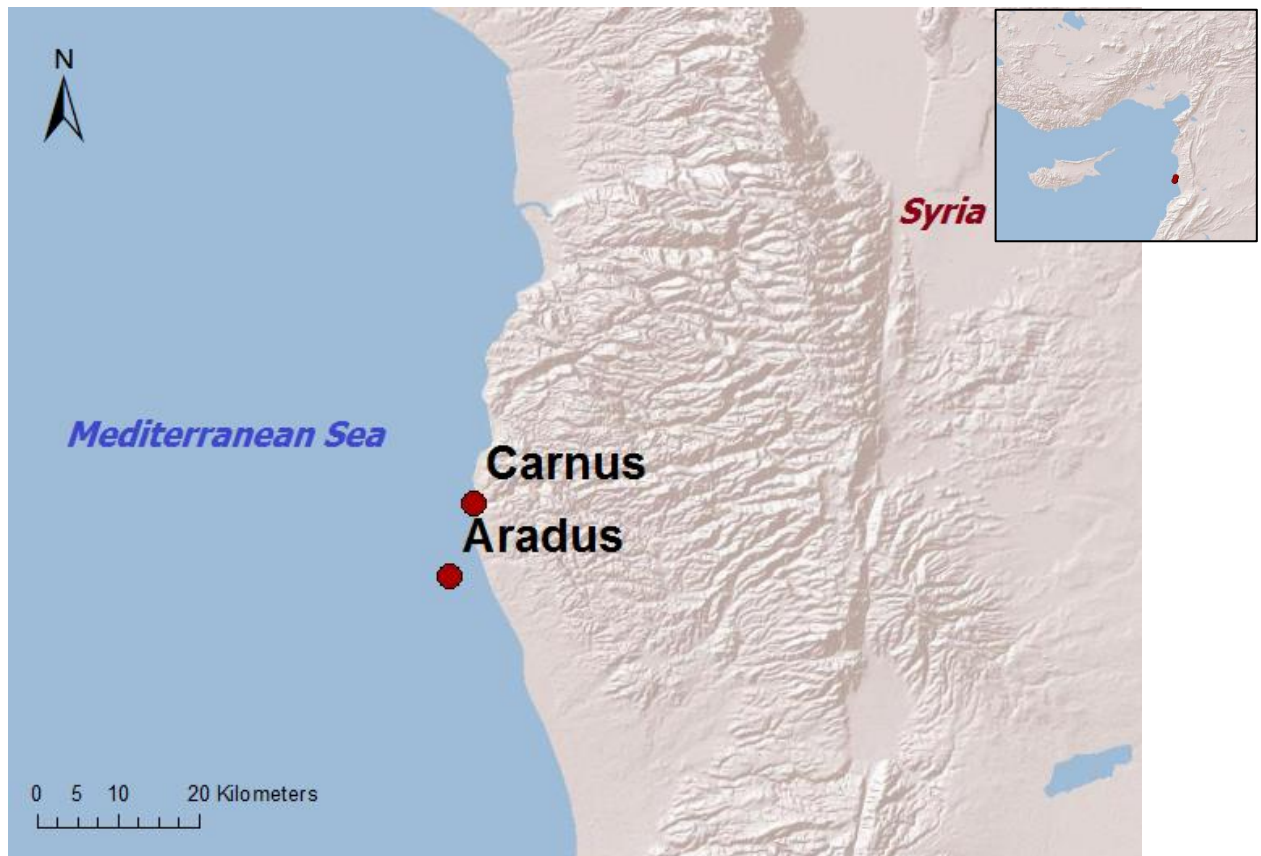
Figure 49. Ἐπίνεια at Populonium, and Carnus and Aradus

A similar situation is found in Strabo, 8.6.25, in relation to Sicyon. The text reports that that city used to be called Aigialeis ("Shores" or "Beaches"), thus suggesting that at the beginning there was no harbour infrastructure.[392] The text sets the ἐπίνειον/epineion in relation with the new town built after its destruction by Demetrius Poliorcetes (4th-3rd century BC): the ἐπίνειον/epineion was the old town, with the λιμήν/limen its one basin or berthing space; and the new town was built somewhat deeper inland. In addition, Sicyon lies close to Corinth and could be used as another of its fore-ports.

A complex case is that posed by Diodorus Siculus, 11.41.2. His text reads that, before Themistocles, Piraeus was not a λιμήν/limen, because the Athenians used Phaleron as their ἐπίνειον/epineion, but that Themistocles made Piraeus into the best λιμήν/limen in Greece (note that he does not call Piraeus an ἐπίνειον/epineion). What this suggests is that there was no infrastructure at Piraeus, particularly as he states that some facilities had to

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[392] Pausanias states that this place is named after an autochthonous king, but the point still stands.

be added to it (μικρᾶς μὲν προσδεόμενον κατασκευῆς), and in particular I would think of the absence of masonry berths and warehouses, perhaps also an administrative apparatus (e.g. customs, the corps of the epimeletai). Of course, though, one cannot reject the possibility that there was some confusion in the textual tradition: the vast majority of the other sources state that Themistocles made Piraeus into an ἐπίνειον/epineion, not into a λιμήν/limen. It could be that the words were swapped, and the text should say that Piraeus was not an ἐπίνειον/epineion, like Phaleron, but that Themistocles made it such by building the infrastructure for a λιμήν/limen. In addition, it is difficult to believe that Themistocles was inspired ex nihilo to make a port, but it would have been plausible that he realised that one of the sites, that at that point must have had a marginal use by Athens due to lack of facilities, was better than the other, so he made ammendments within an already existing place. However, Diodorus was writing several centuries after the formal making of Piraeus into a port. He might be making the distinction Piraeus = λιμήν/limen vs Phaleron = ἐπίνειον/epineion because, unlike Phaleron, Piraeus was connected to the city of Athens by means of the Long Walls.[393]

Anecdotically, the *Suda*, π, 2150 documents a pun with the name of the harbour of Troezen (nowadays Troizina, in the Peloponnese), which is homonymous with the word *beard*. In fact, Strabo, 8.6.14 documents this same harbour saying that the city of Troezen / Posidonia lies 15 stadia from the sea.[394] He should probably have labelled this harbour as ἐπίνειον/epineion rather than λιμήν/limen, but his source in this case might have been something like a *periplus*, a genre that never employs the term ἐπίνειον/epineion. The absence of the term ἐπίνειον/epineion from certain sources, like the *periploi*, can be explained inasmuch as those sources focus in putting in at ports and on the journeys to follow rather than on the political relationships between the coastal towns and the inland capitals. For example, the word ἐπίνειον/epineion appears only once in the *Periplus of Scylax* (passage 109) but there are clues to *epineion*-like relationsips at the times where the coastal route pauses and the text notes the relevant centres "ἐν μεσόγεια". Two clear examples of that are paragraphs 46 and 64.

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[393] For the history of Piraeus: Garland (1987).

[394] In fact, the text says that the town lies "above the sea", but compare the case of Medma in 5.2.3: the city of Medma is founded on a hill, with the port somewhere below it. The same seems to be true for Troezen.

6.2.4 λιμήν with other terms

As noted above, λιμήν/limen is a basic-level term, and as such all other nouns (or their adjectival derivates) may potentially overlap with it. Usually, when two or more terms co-occur, it is in order to mark contrast between different concepts. In this way, for example, Philo, *De Specialibus Legis*, 4.154 explains that the dignity of pilot is not awarded by lot, but to sailors who have trained for a long time, and who have sailed to all the markets, harbours and anchorages (ἐμπόρια δὲ καὶ λιμένας καὶ ὑφόρμους), thus establishing different qualities of ports. To be precise, the ἐμπόρια/emporion do not need to be opposed to the λιμένας/limenas and the ὑφόρμους/hyphormos, because this term entails an economic function, whereas the latter two categories are physical, but it is a well-known resource in rethorics to list items for emphasis on quantity.

Λιμήν/limen co-appears less frequently with ἐμπόριον/emporion and with ναύσταθμον/naustathmon. The latter two are terms referring to the function of the port. In the same way that nowadays one would speak of a "commercial port" or a "military port", ancient Greek texts sometimes refer to the same site as an ἐμπόριον/emporion and a λιμήν/limen (e.g. Polybius, 18.2), or other texts report that a place has a λιμήν/limen and a ναύσταθμον/naustathmon, i.e. a port with a military zone, like Polybius, 5.19.6. Similarly, Appian, *Punic Wars*, 100-101[395] refers to the site where Scipio's troops were indistinctively as a ναύσταθμον/naustathmon and as a λιμήν/limen, the former in reference to the function, the latter to the physical type of harbour.

Λιμήν/limen is only very rarely related to αἰγιαλοί/aigialoi or σάλοι/saloi because these two forms imply the absence of harbour infrastructure, which is precisely the contrary of what λιμήν/limen entails. For example, Diodorus Siculus, 13.15.3-4, narrating part of the Sicilian Expedition, where a naval encounter takes place between the Athenian and the Syracusan fleets, notes that the triremes became scattered on the αἰγιαλός/aigialos and on the λιμήν/limen. Both entities are seen as continuous, existing side by side, but each different from the other: the one is the bare sea shore; the other, the regular port. Similarly, Polybius, 1.53.10 reports of ships anchoring at a σάλος/salos because the shore was ἀλίμενος/alimenos. It stands out, however, that *Stadiasmus*, 126 names Utica as a σάλος/salos, not as a λιμήν/limen. It is difficult to understand why this is so.[396]

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[395] 4.24-25 in other editions.
[396] Because the site of Utica lies inland nowadays due to the sedimentation brought down by the river Medjerda, undertaking studies on site becomes difficult. According to Delile et al. (2015), it is very probable that the port lay to the north-western side of the promontory, but their findings show that the silting up took

6.2.5 Overlapping terms other than λιμήν

Some of the categories other than λιμήν/limen do not seem to co-occur with each other, and there are usually reasons for that. The σάλος/salos, for example, only exists in the absence or the impossibility of accessing a λιμήν/limen (e.g. due to weather conditions or shallow waters), and this excludes what we could term as functions of the λιμήν/limen (ἐπίνειον/epineion, ἐμπόριον/emporion, ναύσταθμον/naustathmon), as well as the ὅρμος/hormos and the αἰγιαλός/aigialos, which are the anchorage proper or the sea shore. The αἰγιαλός/aigialos does not overlap with ἐπίνειον/epineion and ναύσταθμον/naustathmon, because both forms imply infrastructure: the one being the port of a capital, the other being the port of the navy. For the same reason, the ἐμπόριον/emporion, or commercial port, is not associated with the αἰγιαλός/aigialos in the time frame chosen for this thesis (3rd century BC – 5th century AD), although one should not reject the idea that at an earlier age, when neither the social organisation nor the construction techniques were very advanced, trade did take place directly on the sea shore.

In the sources I studied, αἰγιαλός/aigialos co-appears with ὕφορμος/hyphormos in Strabo, 14.1.35, but the source looks remarkably like a periplus. As such, ὕφορμος/hyphormos seems to be an adjective describing the quality of the αἰγιαλός/aigialos, possibly with the intended meaning that there is a shore which could be used as a second-class anchorage. It remains unclear, though, if ὕφορμος/hyphormos is meant as simply a smaller anchorage in relation to somewhere larger or better quality,[397] or they are called ὕφορμος/hyphormos because they were used preferably in an emergency, as suggested by the use of the term αἰγιαλός/aigialos. The expression appears twice in the same passage, relating to Notium and Laius in Chios. Unfortunately, this is difficult to prove from the point of view of the archaeology or the geomorphology, because neither of the two place names has been identified with a specific location in Chios, and in fact there seems to be some textual corruption in the case of Laius. A port town called

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place relatively fast, so that the harbour was no longer in use by the 6th century AD. A British-Tunisian team, led by E. Fentress, is undertaking excavations on site, but the interim reports that are published to not include the harbour area specifically (although they did find some fish-salting vats in 2012). Earlier, Paskoff and Trousset (1992) provide an introduction to the site.

[397] For comparison, Phanae, which lies right before these two locations, is noted as a λιμὴν βαθύς.

Notium is attested in mainland Turkey, in the same bay of Ephesus, but a confusion with its location to Chios in Strabo is certainly strange, as there are good reasons to believe that the geographer visited Ephesus and may have known the region in person. Therefore, it remains a task for future research to try and identify where exactly the places called Notium and Laius in Strabo (or at least, in his textus receptus) were located, and perhaps knowing that they were both an ὕφορμος αἰγιαλός/hyphormos aigialos, rather than a λιμήν/limen, might contribute to our understanding.

Logically, the ναύσταθμον/naustathmon does not appear on the same passages as the ἐμπόριον/emporion because they are performing opposite functions (i.e. the commercial port opposed to the military port). The combination of ναύσταθμον/naustathmon and ἐπίνειον/epineion appears only once within the sources of this thesis,[398] namely Strabo, 8.5.2, in reference to Gytheion. In that particular text, the ναύσταθμον/naustathmon seems to be a specific zone within Sparta's ἐπίνειον/epineion, as Strabo explains that the military port is excavated (ὀρυκτός). The port was heavily fortified, particularly under the tyrant Nabis, but our best source for the fact that – at least part of it – was artificial, is that passage of Strabo himself. Gytheion continued to flourish during the Roman age. In fact, much of the present-day remains belong to the Roman period.[399]

Finally, I have not found any ναύσταθμον/naustathmon in co-occurence with ὅρμος/hormos. After my examination of the individual words in section 4, I believe that one term should not exclude the other (the 'anchoring point' and the 'port used by the navy'), especially if the ὅρμος/hormos was considered to be in a place strategic for the control of the commerce or the protection against piracy. It could be that the data for the smaller anchorages is not recorded in the literary corpus, or it could be that ναύσταθμον/naustathmon only applies to the larger units where the navy also had their headquarters.

Ἐμπόριον/emporion coexists with ὅρμος/hormos and with ἐπίνειον, these terms are not mutually exclusive. A particularly good example of the first case is the *Periplus of the Red Sea*, 24, where the ἐμπόριον/emporion of Mouza is described as ἀλίμενος/alimenos (i.e., lacking a bay or an established harbour complex), but εὔσαλος/eusalos ('good to ride at

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[398] A search in the *TLG* (30th June 2017) shows that there are only two more references to ἐπίνεια that are at the same time ναύσταθμα/naustathma, both in Nicephorus Gregoras (1295-1360): *Historia Romana*, 2, p. 672, line 3 and *Laudatio Sancti Demetrii*, section 9 line 289.

[399] For Sparta and Gytheion during Hellenism and the Roman Empire, see Cartledge and Spawforth (1992²).

anchor') and εὔορμος/euormos ('good to secure the ship') in its sandy ἀγκυροβόλια/ankyrobolia (anchor-dropping points?). As for the second case, Strabo, 6.1.5 documents an ἐπίνειον/epineion called Emporion. That place is related to Medma, for further discussion see section 5.2. In addition, Procopius, *On Buildings,* 5.9.38, reports of another ἐπίνειον/epineion surnamed Emporion. The port in this case is that of Perga in Pamphylia, but Procopius does not explain what city or territory was administratively responsible for this ἐπίνειον/epineion.

Finally, the relationship between an ὅρμος/hormos and an ἐπίνειον/epineion is exemplified in Pausanias, 6.26.4. In that text, Cyllene is described as offering a suitable anchorage for the ships (ὅρμον παρεχομένη ναυσὶν ἐπιτήδειον), but also as the ἐπίνειον/epineion of Elis, 120 stadia distant.

6.3 Latin terms:

There is not much to say on the interaction of Latin terms with each other. It is a cliché that the Romans were less skilled sailors than the Greeks, but at the same time it is true that their technical vocabulary is also much poorer when it comes to port categories.[400] Generally speaking, the Latin literature seems to register the *portus* as opposed to anything else outside of the regular port, more notably *statio* and *litus*. This is best exemplified by Cicero, *Letters to his friends*, 12.15.2, Livy, 27.30, or Caesar, *Civil War*, 3.6-8 and 3.73.

6.4 Greek and Latin compatibility: expressing the same in different systems

Comparing Greek and Latin is a difficult issue because each language consitutes a unique sign system that does not necessarily overlap with the others. For a present-day example, in the Romance languages like French, Italian or Spanish, people "have years", while in English or German, one "is old", and yet both phrases express exactly the same thing, each in their respective system. Yet, while languages are all able to express the same things, perfect superposition of vocabulary is not always the case. A good example of that is the German verb *umziehen*. A German speaker can simply say: "ich ziehe mich um", and context will make the rest, whereas an English speaker needs to specify if they are changing clothes or house, for instance. And not only this, but the use of one expression or another often relies on subjectively perceived categories, as Labov (1972) demonstrated with his

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[400] In contrast, compare the vocabulary for nautical manoeuvres: De Saint-Denis (1935).

examples about cups, bowls and vases. The following notes attempt to summarise how the Latin visions of a port could compare to the Greek ones:

- λιμήν/limen = *portus*. This is the basic-level, generic term. The other categories exist as sub-forms of this one. The nouns on both languages generate adjectives, but their equivalence is less clear in the case of εὐλίμενος/eulimenos and *portuosus*. The latter is formed with a suffix that refers to a large quantity of something (cf. *onerosus*: 'very heavy'), whereas the prefix εὐ- in the case of the Greek refers to the good quality of something (cf. εὔκαιρος: 'well-timed'). The negative adjectives, however, mean roughly the same, ἀλίμενος/alimenos being the negation of (harbourly) shelter, and *importuosus* implying the lack of ports.

- ὅρμος/hormos = *statio ? / portus ? / positio ?* When we consider the ὅρμος/hormos as a full anchorage form, and not just as the anchoring point inside a λιμήν/limen, i.e. when the whole basin is termed ὅρμος/hormos, it is difficult to say what the Latin equivalent would be. The issue arises mainly because we do not have sources of the same type that are directly comparable. One could argue that the distinction in the *Maritime Itinerary* between *portus* and *positio* could be roughly equivalent to that in the Greek *peripli* between λιμήν/limen and ὅρμος/hormos, but then the Greek periply also name other categories (e.g. σάλος/salos). Moreover, *positio* is not documented anywhere else outside the *Itinerary*. One could also argue that ὅρμος/hormos is equivalent to *statio* on the grounds that both categories are inferior to their respective basic-level terms λιμήν/limen and *portus*, but while ὅρμος/hormos does seem to refer to a characteristic point (perhaps emphasising the mooring-rings or points of attachment) the idea conveyed by *statio* is that of temporality, of unloading, loading and leaving again instead of staying for long periods. Therefore, comparing the two is risky: they simply belong to different categories. One even wonders if the ὅρμος/hormos does exist in relation to a λιμήν/limen and, if that *were* the case, if the ὅρμος/hormos sites where there is no λιμήν/limen to compare could effectively be called *portus* in Latin. The problem is, as I just said, that the literary sources preserved in Greek and in Latin are of extremely different nature, and they do not allow for straightforward comparisons.

- ἐπίνειον/epineion = *portus*. The ἐπίνειον/epineion is, essentially speaking, the λιμήν/limen controlled by another community. The Romans do not understand

these categories as separate, possibly because they considered their territory as a unity, in contrast to the Greek system of city-states. Therefore, no need is perceived in Latin to create a specific term. In other words, while the Greeks would refer to Piraeus as "the ἐπίνειον/epineion of the Athenians", for the Romans, Piraeus was simply "the *portus* of the Athenians". Compare, in this sense, Pausanias 1.1.2 with Cornelius Nepos, *life of Themistocles*, 6.1. The dependence relationship is marked in both cases by the addition of a gentilic adjective, only rarely is the genitive of the dominating city employed in the literature (i.e. "of the Athenians" and not "of Athens"). Compare also *Bellum Africum*, 10, documenting a port two miles from the town. It is also noteworthy that the lack of a specific category for the same feature in Latin sometimes causes a difference in standards as perceived by the Greeks. For example, Pliny, *Natural History*, 4.3.7 lists Cirra without relating it to Delphi, while Pausanias names Cirra as the ἐπίνειον/epineion of Delphi on several occasions (10.1.2, 10.8.8, 10.37.4 and 10.37.8).

- ἐμπόριον/emporion = *emporium; portus; statio?* The loan term is used only when a necessity for specification is perceived, or when authors use a direct translation from Greek. The borrowing *emporium* can be observed in Vitruvius, 2.8.11, Livy, 41.1.3-5 and Pomponius Mela, 1.61. Major ports, especially if they had a predominantly commercial function, would be referred to as *portus*. *Statio* would only apply to minor sites with less good climatic or morphological conditions, but it is doubtful if that would translate ἐμπόριον/emporion rather than the fact that ships would have to anchor in the σάλος/salos / open waters in order to perform the trading activities.

- ναύσταθμον/naustathmon = *portus, statio*; *Naustathmus*. *Statio* seems to be the preferred term when the context is clearly that of a military invasion or the operations of the navy, as in the *Bellum Alexandrinum*, 25, where in order to intercept transports from Syria and Cilicia, the Alexandrians station ships at Canopus. However, when the port was established as a military base, the term employed is *portus*, as in Vitruvius, 2.8.14, speaking about the second basin at Halicarnassus.[401] Naustathmus survived only as a toponym.

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[401] The oscillation between *portus* and *statio* can also be observed in the place known as the Port of the Achaeans, supposedly the camp of the Greeks when they attacked Troy. This same place appears in Pliny's *Natural History* as *Statio Achaeorum* in 4.11.49 and 4.12.82-83, but as *Portus Achaeorum* in 5.33.124. Even if the swap of *statio* for a more understandable *portus* had occurred during the textual transmission
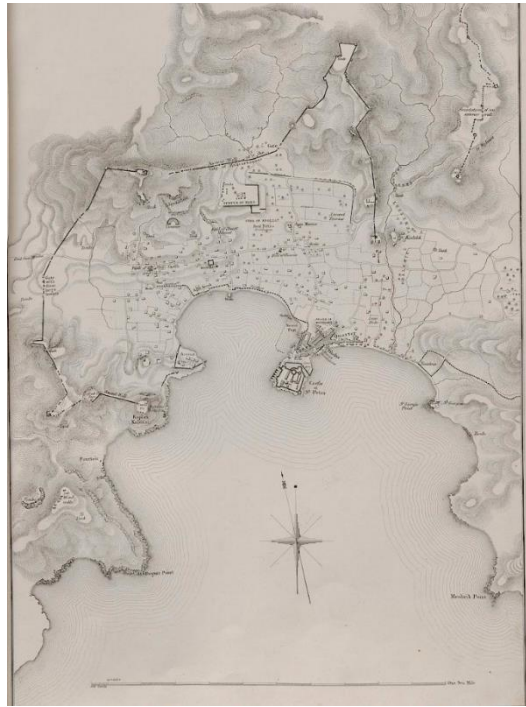
Figure 50. Plan of Halicarnassus. Source: C. T. Newton and R. P. Pullan (1862) A history of the discoveries at Halicarnassus, vol. 1 plate I.

- αἰγιαλός/aigialos = *litus*. These are word equivalents for the sea-shore, both terms are used generally in the same contexts

- σάλος/salos = *salum* / *statio* / "they dropped anchor". The loan term is employed when there arises a necessity to specify or in the case of direct translations from the Greek. Good examples of that are Livy, 37.16, Pomponius Mela, 1.71, and the *Bellum Africum*, 62-63. Latin texts can signify the fact of dropping anchor in open waters with the term *statio*. In other occasions, the Latin literature states that ships dropped anchor in the middle of the sea (for example due to bad weather), but it is doubtful that this is a σάλος/salos properly speaking, because the σάλος/salos (like the Roman *statio*) seems to be located in relative proximity with the land. In this sense, compare Livy, 29.27, and *Bellum Alexandrinum*, 9.

- ἀγκυροβόλιον = (unknown). The lack of data on the Greek side prevents a reasonable association.

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and did not originate in Pliny himself, the interchangeability of the two terms in this case is significant. However, note that in Greek that same place is known as Achaion Limen, and not as Achaion Naustathmon, thus probably pointing to a restricted use of the term ναύσταθμον/naustathmon.

These are, in a nutshell, the Greek and Latin perceived categories in order to refer to anchorages from a theoretical point of view. The schemas proposed in this section aim to furnish a model for the comprehension of the different terms from a linguistic point of view, with the support of physical evidence where possible. To the best of my efforts, I endeavoured to show as much data as possible in order to shed some light onto the research questions with which I had begun this enterprise.

6.5 The input from the case studies

My aim in researching the above case studies was not to provide an exhaustive history of those ports, but to verify if the aspects observed in the analysis of the textual dataset were effective in reality and to fill in gaps in the knowledge where possible. The short conclusion of the data provided by the case studies is that the assumptions made in the theoretical part of this thesis could be sustained.

The Alexandrian case study shows how one same port could be referred to by different descriptive names depending on the interests or perspective of the writer or speaker. While the singularities of Alexandria are manifold, the aspects discussed in 5.1.6 are certainly transferable to the activities in other ports of the Roman Empire, large or small.

Certainly, a small village could still have the advantage of a λιμήν/limen with a zone destined for trade (ἐμπόριον/emporion), or multiple basins like the Great Harbour and the Eunostos, or an extended port, like the details above on Chersonessos. This particular point is also confirmed by some of the Italian harbour systems viewed, like those of Thurii – Rouskiane and the satellites of Tarentum. The binomials Kallipolis – Tarentum and Fratuentium – Tarentum are especially illustrative of the advantages of controlling a port in another territory, respectively thanks to the climatology and to make use of a different geographical area.

Yet the Italian study was pre-eminently valuable to visualise the shortcomings of our data, and this is best exemplified by the cases of Hipponion / Vibo Valentia and Medma. The literature for Hipponion is extremely succinct, but the data collected through archaeological surveys has made it possible to identify the gaps. In the case of Medma, instead, one can only but highlight the problems: the literary data is confused, and the archaeological surveys that are available to the wide scholarly public are too old (1920's and 1980's) and insufficient.

7. CONCLUDING WORDS AND FUTURE WORK

I opened this thesis with remembrance for the admiral Timosthenes and others like him who wrote treatises on ports that are, for the larger part, lost to our days. At the time of closing this thesis, I cannot help but wonder if these treatises on ports had at least one section that could have solved the research questions in this thesis: a section warning, for example, that at a σάλος/salos you need to anchor offshore, or that an ὅρμος/hormos is a sheltered port of secondary quality where you can moor the ship to land and find water and victuals. But, unless archaeologists miraculously discover some papyrus, I guess we will never know. Therefore, at the present state of research, the reason for writing my thesis was more than justified.

Throughout the course of my research I hope I have achieved two things: firstly, the effective collaboration of two complementary disciplines, linguistics and archaeology; secondly, the clarification of the Greek and Roman harbour terminology. Indeed, as I pointed out in the literature review, both disciplines, philology and archaeology, while they are clearly complementary to one another, are not usually undertaken together at a large scale, like I have in this project. Yet the texts are faulty if they have no reference to reality, and at the same time archaeological remains are difficult to interpret without textual support. In consequence, combining the two sets of data was of foremost importance and, I hope, has enriched my thesis in a vast number of opportunities.

Similarly, I hope I have built on and improved the research that had been done up to date, in particular Finzenhagen (1940) and Rougé (1966). Their research was carried out on a small scale, and necessarily so owing to the resources that they had access to. In other words: the work of previous scholars was fully dependent on what books they stored in their libraries, public or private. In my case, however, I was fortunate to count on the assistance of the latest technologies. Databases like the *TLG* and *PHI* allowed for the mass search of whole corpuses. Therefore, I did not have to rely on my memory or on a restricted number of books – I was able to read as much literature as we nowadays know of. This was incredibly advantageous, not only because it granted me access to all passages, both relevant and irrelevant, but also because databases are enormously time-saving tools, so

that I was able to proceed to the analysis of the relevant data almost straightaway, and also I was able to go back to the searches or perform new searches for particular expressions when needed with unprecedented ease. Thanks to that, I hope I have presented in this thesis as much data as I found to be significant.

More specifically, I hope the etymological approach adopted here was especially fruitful. Surely speakers do not think constantly about the origin of the words that they use in their everyday life. However, when those words were created, they did mean something in context. Think of the word *pen*: it comes from Latin *penna*, meaning 'feather', because the first pens were made by cutting feathers into a certain shape. Therefore, I belive that the etymological research made an important contribution to the concepts in this thesis, particularly in the cases of ὅρμος/hormos and σάλος/salos.

While this thesis does, I hope, answer some questions in relation to the typology of Mediterranean ports, research can certainly continue to be done in the future. I would point in particular to three directions: further work on the Mediterranean, work outside the Mediterranean, and ships' manoeuvres.

While research in the area of the Mediterranean basin is abundant, some important points still need to be clarified. Notably, I believe a thorough study of the *Maritime Itinerary*, and in particular the second part, is of chief importance and urgency. Indeed, one of the parts of the *Maritime Itinerary* records the types of ports. That part rises more questions than we are in the position to answer nowadays. For instance, modern research contents itself with relating the concept of *positio* with that of *statio*. This is possible, but clarifying what exactly are the conditions of a *positio* would also contribute to our understanding of the *statio*. I believe a combination of history, archaeology, GIS, and philology would be optimal to solve that issue. The other question posed by that part of the *Maritime Itinerary* is the reason for documenting port forms other than *portus* and *positio*, and namely it is very noticeable that the *Itinerary* documents beaches. There could be legitimate reasons for that, like the taking of drinking water or the seeking of shelter during a storm, but one would expect that a regular market would also have a regular port: do the beaches indicate black market or tax evasion points?

Additionally, I belive a comparison between the ancient peripli, like the *Stadiasmus*, the *Periplus of the Red Sea*, or that of Scylax, with the medieval portulans would be highly

interesting. Such a comparison would offer insights into inhabitation patterns and trading routes, perhaps also on the products of trade and on legal aspects.

Outside the Mediterranean area, I believe the Red Sea provides a fruitful field for work, as well as the shores of the Arabian Peninsula, Iran, Pakistan and India, which are also documented in some Graeco-Roman sources. That trade route was extremely rich, and it was certainly useful to make comparisons in this thesis between the Mediterranean sources and those based in the Red and the Indian Seas.

Finally, I believe this thesis could also be enriched with a study of the manoeuvres of the ships. For example, the fact that a port is marked as θερινός ('for the summer season'), does not necessarily mean that it stopped working in the winter. What were the challenges for ships to access it during the bad season? Even in the case of the port of Alexandria: we are constantly warned about submerged reefs and the need to enter the port sailing along a certain "path", but what was this path? In the case of ports with canals or narrow entrances, like Portus or Carthage, how did ships manage to not crash into one another or become bottled up? The field of archaeology and GIS studies would certainly be enriching in the investigation of these questions.

Finally, I hope that my thesis has furnished some useful insights in the Greek and Latin harbour terminology. I hope it can become a productive tool for future researchers, while at the same time raising interesting questions for future scholarly work. Τέλος.

BIBLIOGRAPHY AND REFERENCES

NOTE: unless the contrary is specified, web sites are accessed regularly during the totality of the time dedicated to this thesis.

Editions of ancient texts

Achilles Tatius: Vilborg, E. (1955) *Achilles Tatius. Leucippe and Clitophon*, Stockholm: Almqvist & Wiksell

Aelius Aristides:

Dindorf W. (1829) *Aristides*, vol. 3, Leipzig: Reimer (repr. Hildesheim: Olms, 1964)

Aeschines: Schultz, F. (1865) *Aeschinis orationes,* Leipzig: Teubner

Dilts, M. R. (1992) *Scholia in Aeschinem*, Leipzig: Teubner

Agathias: Keydell, R. (1967) *Agathiae Myrinaei historiarum libri quinque*, in: *Corpus Fontium Historiae Byzantinae. Series Berolinensis 2.* Berlin: De Gruyter

Alexander's historians: Hedicke, E. (1908) *Historiarum Alexandri Magni Macedonis libri qui supersunt*, Leipzig: Teubner

Apollodorus: Wagner, R. (1894) *Apollodori bibliotheca. Pediasimi libellus de duodecim Herculis laboribus*, Leipzig: Teubner

Apollonius Rhodius: Fraenkel, H. (1961, reprinted and corrected 1970) *Apollonii Rhodii Argonautica*, Oxford: Clarendon Press

Seaton, R. C. (1912) *Apollonius Rhodius. The Argonautica*, London: William Heinemann and New York: the MacMillan Co.

Appian: Gabba, E.; Roos, A. G.; Viereck, P. (1962²) *Appiani Historia Romana*, vol. 1, Leipzig: Teubner

White, H. (1912-1913) *Appian's Roman History*, 4 voll., London: William Heinemann and New York: Macmillan

Aristophanes:

Dübner, F. (1877) *Scholia Graeca in Aristophanem*, Paris: Didot (repr. Hildesheim: Olms, 1969)

Aristotle: Louis, P. (1964-1969) *Aristote. Histoire des animaux*, 3 voll., Paris: Les Belles Lettres

Oppermann, H. (1928), *Aristotelis Ἀθηναίων Πολιτεία*, Leipzig: Teubner (repr. 1968)

Ross, W.D. (1957, reprint 1964) *Aristotelis politica*, Oxford: Clarendon Press

Arrianus: Ross, A. G. and Wirth, G. (1967) *Flavii Arriani quae exstant omnia*, vol. 1, Leipzig: Teubner

Aulus Gellius: Hosius, C. after Hertz, M. (1903) *A. Gellii Noctium atticarum libri XX*, 2 voll., Leipzig: Teubner (repr. Stuttgart 1967)

Caesar: Dinter, B. (1898²) *C. Iulii Caesaris Belli Civilis Libri III*, Leipzig: Teubner

Du Pontet, R. (1900) *C. Iulii Caesaris Commentariorum. Pars prior qui continetur libri VII de Bello Gallico cum A. Hirti supplemento*, Oxford: Oxford University Press

Klotz, A. (1927) *C. Iulii Caesaris Commentarii*, vol. 3: *Commentarii Belli Alexandrini, Belli Africi, Belli Hispaniensis*, Leipzig: Teubner

Cassius Dio: Boissevain, U.P. (1895-1901) *Cassii Dionis Cocceiani historiarum Romanarum quae supersunt*, 3 voll., Berlin: Weidmann (repr. 1955)

Celsus: Spencer, W. G. (1948-1953) *Celsus. De Medicina*, 3 voll. London: William Heinemann and Cambridge MA: Harvard University Press

Cicero: Clark, A. C. (1908²) *M. Tulli Ciceronis orationes. Pro Sex. Roscio, de imperio Cn. Pompei, pro Cluentio, in Catilinam, pro Murena, pro Caelio*, Oxford: Clarendon press

Clark, A. C. (1909) *M. Tulli Ciceronis orationes. Pro Quinctio, pro Q. Roscio Comoedo, pro A. Caecina, de lege agraria, contra Rullum, pro C. Rabinio Perduellionis reo, pro L. Flacco, in L. Pisonem*, Oxford: Clarendon press

De la ville de Mirmont, H. (1960) *Cicéron. Discours, vol. 2: contre Q. Caecilius dit "la divination", première action contre C. Verrès, seconde action contre C. Verrès, livre premier: la préture urbaine*, Paris: les Belles Lettres

Müller, C. F. W. (1915) *M. Tullius Cicero. De divinatione*, Leipzig: Teubner

Peterson, G. (1916) *M. Tulli Ciceronis orationes. Divinatio in Q. Caecilium, in Verrem*, Oxford: Clarendon press

Stroebel, E. (1915) *M. Tullius Cicero. Rhetorici libri duo qui vocantur de inventione*, Leipzig: Teubner

Testard, M. (1965-1970) *Cicéron. Les dévoirs*, 2 voll., Paris: les Belles Lettres

Watt, W. S. (1958) *M. Tulli Ciceronis Epistulae*, Oxford: Clarendon Press

Chariton: Reardon, B. P. (2004) *Charitonis Aphrodisiensis de Callirhoe narrationes amatoriae*, Munich and Leipzig: K. G. Saur

Cornelius Nepos: Fleckeisen, A., after Halmium, C. (1898[2]) *Cornelius Nepos. Vitae*, Leipzig: Teubner

Demosthenes: Rennie, W. (1921) *Demosthenis orationes*, vol. 2.2, Oxford: Clarendon Press (repr. 1966)

Dilts, M. R. (1983-1986) *Scholia Demosthenica*, 2 voll., Leipzig: Teubner

Digest: Mommsen, Th. and Krueger, P. (1870) *Iustiniani Digesta*, Berlin: Weidmann

Dio of Prusa: von Arnim, J. (1893-1896[2]) *Dionis Prusaensis quem vocant Chrysostomum quae exstant omnia*, voll. 1-2, Berlin: Weidmann (repr. 1962)

Diodorus Siculus: Fischer, K. T.; Bekker, I.; Dindorf, L.; Vogel, F. (1888-1906) *Diodori bibliotheca historica*, 5 voll. Leipzig: Teubner (repr. 1964)

Dionysius of Halicarnassus: Jacoby, K. (1885-1905) *Dionysii Halicarnasei antiquitatum Romanarum quae supersunt*, Leipzig: Teubner (repr. 1967)

Etymologicum Gudianum: Sturz, F. W. (1818) *Etymologicum Graecae linguae Gudianum et alia grammaticorum scripta e codicibus manuscriptis nunc primum edita*, Leipzig: Weigel

Etymologicum Magnum: Gaisford, T. (1848) *Etymologicum magnum*, Oxford: Oxford University Press (repr. Amsterdam: Hakkert, 1967)

Festus: Lindsay, W. M. (1913) *Sexti Pompei Festi de verborum significatu quae supersunt cum Pauli epitome*, Leipzig: Teubner

Flavius Josephus: Niese, B. (1887-1895) *Flavii Iosephi opera*, 6 voll., Berlin: Weidmann (repr. 1955)

   Thackeray, H. St. J. (1927-1934) *Josephus*, 8 voll., Cambridge, MA: Harvard University Press

Florus: Forster, E. S. (1929) *Lucius Aennaeus Florus. Epitome of Roman history*, London: William Heinemann, and New York: G.P. Putnam's Sons

Frontinus: Gundermann, G. (1888) *Iuli Frontini Strategematon libri quattuor*, Leipzig: Teubner

Geographi Graeci Minores: Müller, K. (1855) *Geographi Graeci minores*, 3 voll., Paris: Didot (repr. Hildesheim: Olms, 1965)

Hesychius: Latte, K. (1953-1966) *Hesychii Alexandrini lexicon*, 2 voll., Copenhagen: Munksgaard

Historia Augusta: Hohl, E. (1927) *Scriptores Historiae Augustae*, 2 voll., Leipzig: Teubner

Homer: Monro, D. B., and Allen, T. W. (1902-1912) *Homeri opera*, 5 voll., Oxford: Clarendon Press

   Dindorf, W. (1855) *Scholia Graeca in Homeri Odysseam*, 2 voll., Oxford: Oxford University Press, (repr. Amsterdam: Hakkert, 1962)

   Erbse, H. (1969-1988) *Scholia Graeca in Homeri Iliadem (scholia vetera)*, vols. 1-5, 7, Berlin: De Gruyter

Hyppolitus: Bauer, A. and Helm, R. (1929) *Hippolytus Werke.* vol. 4, *Die Chronik*, Leipzig: J. C. Hinrichs'sche Bucchandlung

Julius Pollux: Bethe, E. (1900-1931) *Pollucis onomasticon*, 2 voll., Leipzig: Teubner

Lexica Segueriana, Glossae Rethoricae: Bekker, I. (1814) *Anecdota Graeca*, vol. 1, Berlin: Nauck, 195-318

Livy: Conway, R. S. and Walters, C. F. (repr. 1963) *Titi Livi ab urbe condita*, voll. 1 (books 1-5), 2 (6-10), 3 (21-25), Oxford: Clarendon Press

Conway, R. S. and Johnson, K. (repr. 1963) *Titi Livi ab urbe condita*, vol. 4 (books 21-30), Oxford: Clarendon Press

McDonald, A. H. (1965) *Titi Livi ab urbe condita*, vol. 5 (books 31-35), Oxford: Clarendon Press

Walsh, P. G. (1999) *Titi Livi ab urbe condita*, vol. 6 (books 36-40), Oxford: Clarendon press

Longus: Dalmeyda, G. (1934, reprinted 1971) *Longus. Pastorales (Daphnis et Chloé)*, Paris: Les Belles Lettres

Lucan: Hosius, C. (1913³) *M. Aennaei Lucani Belli Civilis libri decem*, Leipzig: Teubner

Lycophron: Scheer, E. (1958) *Lycophronis Alexandra*, vol. 2, Berlin: Weidmann

Menander Rhetor: Russell, D. A. and Wilson, N. G. (1981) *Menander rhetor*, Oxford: Clarendon Press

Oribasius: Raeder, J. (1928-1933) *Oribasii collectionum medicarum reliquiae*, 4 voll., Leipzig: Teubner

Pausanias: Spiro, F. (1903) *Pausaniae Graeciae descriptio*, 3 voll., Leipzig: Teubner

Philo of Alexandria: Cohn, L. (1906) *Philonis Alexandrini opera quae supersunt*, vol. 5, Berlin: Reimer, (repr. Berlin: De Gruyter, 1962)

Cohn, L. (1915) *Philonis Alexandrini opera quae supersunt*, vol. 6, Berlin: Reimer, (repr. Berlin: De Gruyter, 1962)

Philostratus: De Lannoy, L. (1977) *Flavii Philostrati Heroicus*, Leipzig: Teubner

Kayser, C. L. (1870-1871) *Flavii Philostrati opera*, voll. 1 and 2, Leipzig: Teubner (repr. Hildesheim: Olms, 1964)

Plautus: Lindsay, W. M. (1904-1905) *T. Macci Plauti Comoediae*, 2 voll., Oxford: Clarendon Press

Pliny: Mayhoff, C. (1906) *C. Plinii Secundi Naturalis Historiae libri XXXVII*, Stuttgart: Teubner (reprint 1967)

Pliny the Younger: Raddice, B. (1969) *Pliny. Letters and Panegyricus*, 2 voll., Cambridge MA: Harvard University Press, and London: William Heinemann

Plutarch: Ziegler, K. (reprinted 1964-1971) *Plutarchi vitae parallelae*, voll. 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4, and 5, Leipzig: Teubner

Perrin, B. (1914-1926) *Plutarch's Lives*, 11 voll., London: William Heinemann and New York: G. P. Putnam's sons, and Cambridge, MA: Harvard University Press

Nachstädt, W. (1935) *Plutarchi moralia*, vol. 2.1, Leipzig: Teubner (repr. 1971)

Polybius: Büttner-Wobst, T. (1893-1905) *Polybii historiae*, 4 voll., Leipzig: Teubner (repr. 1962-1967)

Pomponius Mela: Frick, K. (1880) *Pomponii Melae De Chorographia libri tres*, Leipzig: Teubner

Parthey, G. (1867) *Pomponii Melae De Chorographia libri tres*, Berlin: F. Nicolai

Portolans: Delatte, A. (1947) *Les Portulans Grecs*, Liège : Faculté de Philosophie et Lettres de l'Université de Liège and Paris : Librairie E. Droz

Procopius: Wirth, G. after Haury, J. (1962-1964) *Procopii Caesariensis opera omnia*, 4 voll., Leipzig: Teubner

Ptolemy: Grasshoff, G. and Stückelberger, A. (2006) *Klaudios Ptolemaios Handbuch der Geographie*, voll. 1-2, Basel: Schwabe

Septuaginta: Rahlfs, A. (1935⁹, reprinted 1971) *Septuaginta*, 2 voll., Stuttgart: Württemberg Bible Society

Servius: Thilo, G. and Hagen, H. (1881) *Maurus Servius Honoratus. In Vergilii carmina comentarii. Servii Grammatici qui feruntur in Vergilii carmina commentarii*, Leipzig: Teubner

Strabo: Meineke, A. (1877) *Strabonis geographica*, 3 voll., Leipzig: Teubner

Suda: Adler, A. (1928-1935) *Suidae lexicon*, 4 voll., Leipzig: Teubner

Suetonius: Ihm, M. (1907) *C. Suetoni Tranquilli opera. Volumen I: de vita Caesarum libri VIII*, Leipzig: Teubner

Tacitus: Fisher, C. D. (1906, reprinted 2008) *Cornelii Taciti Annalium ab excessu divi Augusti libri*, Oxford: Clarendon Press

Fisher, C. D. (1911, reprinted 2008) *Cornelii Taciti Historiarum libri*, Oxford: Clarendon Press

Winterbottom, M. and Ogilvie, R. M. (1975) *Corneli Taciti Opera Minora*, Oxford: Oxford University press

Tertullian: Becker, C. (19612) *Tertullian. Apologeticum. Verteidigung des Christentums*, München: Kösel

Thucydides: Jones, H. S. and Powell, J. E. (1942) *Thucydidis historiae*, 2 voll., Oxford: Clarendon Press (repr. 1967-1970)

Virgil: Mynors, R. A. B. (1969) *P. Vergili Maronis Opera*, Oxford: Clarendon Press

Vitruvius: Krohn, F. (1912) *Vitruvii de architectura libri decem*, Leipzig: Teubner

Xenophon: Marchant, E.C. (1920) *Xenophontis opera omnia*, vol. 5, Oxford: Clarendon Press (repr. 1969)

Modern print publications

Agazzi, R. (2006) *Giulio Cesare, stratega in Gallia*, in *Militaria*, 6.

Albu, E. (2014) *The Medieval Peutinger Map. Imperial Roman revival in a German empire*, New York: Cambridge University Press

Alföldi, A. (1984) *Caesariana. Gesammelte Aufsätze zur Geschichte Caesars und seiner Zeit*, Bonn: R. Habelt

Allison, P. M. (1997) *Roman households. An archaeological perspective*, in: Parkins, H. (ed.) *Roman Urbanism. Beyond the consumer city*, London: Routledge, pp. 112-146

Allison, P. M. (1999) *Labels for ladles: interpreting the material culture of Roman households*, in: Allison, P. M. (ed.) *The Archaeology of Household Activities*, London: Routledge, pp. 57-77

Allison, P. M. (2004) *Pompeian Households. An analysis of the material culture*, Los Angeles: Costen Institute of Archaeology, UCLA

André, J.M. and Hus, A. (1974) *L'histoire à Rome. Historiens et biographes dans la literature Latine*, Paris: Presses Universitaires de France

Andreau, J. (1987) *la vie financière dans le monde romain: les métiers de manieurs d'argent*, Rome: École française de Rome

Andreau, J. (1999) *Banking and business in the Roman world*, transl. Lloyd, J., Cambridge: Cambridge University Press

Andriotis, N. P. (1992³) *ετυμολογικό λεξικό της κοινής νεοελληνικής*, Thessaloniki: Institute of Modern Greek Studies, Manolis Triandaphyllidis Foundation

Aquilué, X., ed. (2012) *Empúries. Municipium Emporiae*, in: *Ciudades Romanas de Hispania*, 6, Roma: "L'Erma" di Bretschneider

Ardaillon, E. (1898) *Quomodo Graeci collocaverint portus atque aedificaverint*, Paris: Le Bigot

Arnaud, P. (2005) *Les routes de la navigation antique. Itinéraires en Méditerranée*, Paris: Errance

Arnaud, P. (2010a) *Systèmes et hiérarchies portuaires en Narbonnaise*, in X. Delestre and H. Marchesi (edd.), 2010: *Archéologie des rivages méditerranéens. 50 ans de recherche. Actes du colloque d'Arles, 28-29-30 octobre 2009*, 1st ed. Paris: éditions Errance / Ministère de la Culture.

Arnaud, P. (2010b) *Notes sur le Stadiasme de la Grande Mer (2): rose des vents, systèmes d'orientation et Quellenforschung*, in: *Geografia Antiqua*, 19, pp. 157-162

Arnaud, P. (2012) *Le Periplus Maris Erythraei: une oeuvre de compilation aux préocupations géographiques*, in: *Topoi*, suppl. 11, pp. 27-61

Arnaud, P. (2013) *Critères de vérité chez les géographes anciens*, in Guerrier, O.: *La vérité*, Saint-Étienne: Presses Universitaires de Saint-Étienne, pp. 43-55

Arnaud, P. (2014) *Maritime infrastructure. Between Public and Private Initiative*, in: Kolb, A. (ed.) *Infrastruktur und Herrschaftsorganisation im Imperium Romanum*, Berlin: De Gruyter, pp. 161-179

Arnaud, P. (2015a) *The interplay between practitioners and decision-makers for the selection, organisation, utilisation and maintenance of ports in the Roman Empire*, in: Preiser-Kapeller, J. and Daim, F. (edd.) *Harbours and Maritime Networks as complex adaptative systems, RGZM-Tagungen* vol. 23: *Interdisziplinäre Forschungen zu den Häfen von der Römischen Kaiserzeit bis zum Mittelalter in Europa*, vol. 2, pp. 61-80

Arnaud, P. (2015b) *La batellerie de fret nilotique d'après la documentation papyrologique (300 avant J.-C. – 400 après J.-C.)*, in: Pomey, P. (ed.) *La batellerie égyptienne. Archéologie, histoire, ethnographie*, Alexandria: Centre d'Études Alexandrines

Arnaud, P. (2016a) *Cities and maritime trade under the Roman empire*, in: Schäfer, Ch., *Connecting the Ancient World. Mediterranean Shipping, Maritime Networks and their Impact*, Rahden: Verlag Marie Leidorf GmbH

Arnaud, P. (2016b) *Entre mer et rivière: les ports fluvio-maritimes de Méditerranée ancienne. Modèles et solutions*, in: Sanchez, C. and Jézégou, M.-P. (edd.) *Les ports dans l'espace méditerranéen antique. Narbonne et les systèmes portuaires fluvio-lagunaires*, Montpellier-Lattes: Éditions de l'Association de la Revue archéologique de Narbonnaise, pp. 139-156

Arquillué, X.; Castanyer, P.; Santos, M. and Tremoleda, J. (2007²) *Empúries. Guies del Museu d'Arqueologia de Catalunya*, Tarragona: Museu d'Arqueologia de Catalunya[402]

Auriemma, R. (2004) *Salentum a salo. Porti, approdi, merci e scambi lungo la costa adriatica del Salento*, 2 voll., Lecce: Congedo editore

Auriemma, R.; Mastronuzzi, G.; Sansò, P.; and Zongolo, F. (2005) *The harbour of the Mansio Ad Speluncas (Brindisi, Italy): a key to the lecture of sea level changes in the past 3500 years?*, in: Marcet i Barbé, R.; Brebbia, C. A.; and Olivella, J. (edd.) *Maritime Heritage and Modern Ports*, pp. 5-14.

Ausfeld, A. (1900) *Zur Topographie von Alexandria und Pseudokallisthenes I 31-33*, Frankfurt am Main: J. D. Sauerländers Verlag

Babiniotis, G. (2002) *Λεξικό της νέας Ελληνικής γλώσσας*, Athens: Κέντρο λεξικολογίας ε.π.ε.

---

[402] There exists an English version of this guide, but the one I have had access to is the publication in Catalan.

Bailly, A.; Séchan, L. and Chantraine, P. (2000⁴) *Dictionnaire grec-français*, Paris: Hachette

Bakker, E. J. (1988) *Linguistics and formulas in Homer. Scalarity and the description of the particle per*, Amsterdam, Philadelphia: John Benjamins Publishing Company

Baldick, Ch. (2008³) *The Oxford dictionary of literary terms*, Oxford and New York: Oxford University Press

Baldson, J. P. D. V. (1957) *The veracity of Caesar*, in: *Greece and Rome*, 4.2, pp. 19-28

Barello, F. (1989) *Resti di architettura greca a Hipponion*, in: *Annali della Scuola Normale Superiore di Pisa. Classe di Lettere e Filosofia*, Serie III, Vol. 19, No. 2, pp. 535-558

Barsalou, L. W. (1987) *The instability of graded structure: implications for the nature of concepts*, viewed online at: http://old.nbu.bg/cogs/personal/kokinov/COG507/The%20instability%20of%20graded%20structure.pdf; accessed: 2nd September 2016

Barwick, K. (1938) *Caesars Commentarii und das Corpus Caesarianum*, in: *Philologus*, suppl. 31.2

Beard, M. (2008) *Pompeii: the life of a Roman town*, London: Profile Books

Beaujeau, J. (1960) *Le soulèvement en Gaule et la veracité de César*, in: *Actes du Congrès de l'Association Guillaume Budé 1958*, Paris: Les Belles Lettres, pp. 249-251

Beckmann, F. (1930) *Geographie und Ethnographie in Caesars Bellum Gallicum*, Dortmund: Ruhfus; viewed online at: http://www.rhm.uni-koeln.de/083/Klotz1.pdf (accessed June 2016)

Beeks, R. and van Beek, L. (2009) *Etymological Dictionary of Ancient Greek*, 2 voll., Leiden: Brill

Bekker, I. (1814) *Anecdota Graeca*, vol. 1, Berlin: Nauck

Benozzo, F. (2004) *Landscape Perception in Early Celtic Literature*, Aberystwyth: Cynrhan type family by CSP-Cymru Cyf

Bergmann, M. and Heinzelmann, M. (2004) *Schedia, Alexandria's harbour on the Canopic Nile (Kom el Giza / department of Beheira). Preliminary report on the second*

season 2004, viewed online at http://archaeologie.uni-koeln.de/files/Bergmann_Heinzelmann_Schedia_2004.pdf, accessed: 15th Sept. 2016

Bethemont, J. (20083) *Géographie de la Méditerranée. Du Mythe unitaire à l'espace fragmenté*, Paris: A. Colin

Blackman, D. J. (1973) *Evidence of sea level change in ancient harbours and coastal installations*, in: Blackman, D. J. (ed.) *Marine Archaeology. Proceedings of the twentythird symposium of the Colston Research Society held in the University of Bristol April 4th-8th 1971*, London: Butterworths, pp.115-137

Blackman, D. J. (1982a) *Ancient harbours in the Mediterranean*, part 1, in: *International Journal of Nautical Archaeology*, 11, pp. 79-104

Blackman, D. J. (1982b) *Ancient harbours in the Mediterranean*, part 2, in: *International Journal of Nautical Archaeology*, 11, pp. 185-211

Blackman, D. J.; Yiannikouri, A.; Knoblauch, P. (1996) *Die Schiffshäuser am Mandrakihafen in Rhodos*, in: *Archäologischer Anzeiger*, 1996, 3, pp. 371-426

Blackman, D. J. (1999-2000) *Οι λιμένες της αρχαίας Ρόδου*, in: *Ρόδος, 2.400 χρόνια : η πόλη της Ρόδου από την ίδρυσή της μέχρι την κατάληψη από τους τούρκους (1523); Διεθνές Επιστημονικό Συνέδριο, Ρόδος, 24-29 Οκτωβρίου 1993*, Athens: *Πρακτικά, τ. Α*, pp. 41-50.

Blackman, D.; Rankov, B.; Baika, K.; Gerding, H.; Pakkanen, J. (2013) *Shipsheds of the ancient Mediterranean*, New York: Cambridge University Press.

Blue, L. K. and Khalil, E., edd. (2010) *Lake Mareotis: Reconstructing the Past. Proceedings of the International Conference on the Archaeology of the Mareotic Region*, Oxford : Archaeopress (BAR international series 2113; University of Southampton series in archaeology 2)

Blue, L. K.; Khalil, E. and Trakadas, A. edd. (2011) *A multidisciplinary approach to Alexandria's economic past: the Mareotis Case Study*, Oxford: Archaeopress

Blutner, R. (2016) *Lexical Semantics and Pragmatics*, viewed online at http://www.blutner.de/lexsem.pdf; accessed: 2nd September 2016.

Boatwright, M. T. (2000) *Hadrian and the cities of the Roman Empire*, Princeton: Princeton University Press

Bogaert, R. (1968) *Opérations de banque des temples*, in: Bogaert, R. (ed.) *Banques et Banquiers dans les Cités Grecques*, Leyde: A. W. Sijthoff, pp. 279-304.

Bonde, Sh. and Houston, S. D. (2013) *Re-presenting the past : archaeology through text and image*, Oxford: Oxbow books

Bonnard, L. (1913) *La navigation intérieure de la Gaule à l'époque Gallo-Romaine*, Paris: Librairie Alphonse Picard

Botti, G. (1898) *La côte Alexandrine dans l'antiqité*, Cairo: Imprimerie Nationale

Bouiron, M. and Tréziny, H. (edd.) (2001) *Marseille. Trames et paysages urbains de Gyptis au roi René*, Aix-en-Provence: Édisud, Centre Camille-Jullian

Bourguet, E. (1929) *Fouilles de Delphes. III, Épigraphie. Fasc. 1, Inscriptions de l'entrée du sanctuaire au trésor des Athéniens*, Paris: E. de Boccard

Bowman, A. K. (1996²) *Egypt after the Pharaohs, 332 BC – AD 642*, Hong Kong: British Museum Press

Bréguet, E. (1980) *Cicéron. La république*, 2 voll., Paris: les Belles Lettres

Bresson, A. (2016) *The Making of the ancient Greek economy. Institutions, markets and growth in the city-states*, Princeton and Oxford: Princeton University Press (translated by S. Rendall)

Bresson, A. and Rouillard, P. edd., (1993) *L'emporion*, Paris: De Boccard

Bricault, L. and Versluys, M. J. (2014) *Religions in the Graeco-Roman World: Power, Politics and the Cults of Isis: Proceedings of the Vth International Conference of Isis Studies, Boulogne-sur-Mer, October 13-15, 2011*, Leiden: Brill

Broekaert, W. (2013) *Navicularii et Negotiantes. A prosopographical study of Roman merchants and shippers*, Pharos, Studien zur griechisch-römischen Antike, vol. 28, Rahden: Verlag Marie Leidorf GmbH

Bubenhofer, N. and Scharloth, J. (2013) *Korpuslinguistische Diskursanalyse. Der Nutzen empirisch-quantitativer Verfahren*, in: Meinhof, U. H.; Reisigl, M. and Warnike, I. H.

(edd.) *Diskurslinguistik im Spannungsfeld von Deskription und Kritik*, Berlin: Akademie Verlag, vol. 1, pp. 147-167

Buccellati, G. (2012) *Towards a linguistic model for archaeology*, in: *Revue d'assyriologie et d'archéologie orientale*, vol. 106, pp. 37-43.

Buraselis, K.; Stefanou, M. and Thompson, D. J. (edd.) (2013) *The Ptolemies, the Sea and the Nile. Studies in waterborne power*, Cambridge: Cambridge University Press

Bussemaker, U. C. (1849) *Scholia et paraphrases in Nicandrum et Oppianum*, in: Dübner, F. (ed.) *Scholia in Theocritum*, Paris: Didot

Caliro, S.; Chiodini, G.; Izzo, G.; Minopoli, C.; Signorini, A.; Avino, R.; Granieri, D. (2008) *Geochemical and biochemical evidence of lake overturn and fish kill at Lake Averno, Italy*, in: *Journal of Volcanology and Geothermal Research*, 178.2, pp. 305-316

Calza, G. (1923) *Regione I (Latium et Campania). VIII. Ostia: Silloge epigrafica ostiense*, in: *Notizie degli scavi di antichità*, 20, pp. 397-411, esp. pp. 399-402.

Campbell, P. (2017) *Innovation and Technological Change in the Archaeological Record: Conceptual Design in Mediterranean Maritime Technology from the Archaic to Late Antiquity*, Southampton, [thesis]

Capponi, L. (2005) *Augustan Egypt. The creation of a Roman province*, New York and London: Routledge

Capriotti Vittozzi, G. (2013) *la terra del Nilo sulle sponde del Tevere*, Roma: Aracne

Carter, J. M. (1970) *the battle of Actium: the rise & triumph of Augustus Caesar*, London: Hamilton

Cartledge, P. and Spawforth, A. (1992²) *Hellenistic and Roman Sparta. A tale of two cities*, London and New York: Routledge

Cary, W. (1949) *The geographic background of Greek and Roman history*, Oxford: Clarendon Press

Casanovas i Vilà, V. (1978) *Vilassar de Mar: documental i històric*, Vilassar de Mar: Oikos-Tau

Casson, L. (1951) *Speed under sail of ancient ships*, in: *Transactions and Proceedings of the American Philological Association*, 82, pp. 136-148

Cerchiai, L.; Jannelli, L. and Longo, F. (2004) *The Greek cities of Magna Graecia and Sicily*, Los Angeles: Getty Publications

Chankowski, V. (2007) *les categories du vocabulaire de la fiscalité dans les cités grecques*, in: Andreau, J. and Chankowski, V., edd.: *Vocabulaire et expression de l'économie dans le monde antique*, Paris: De Boccard

Chankowski, V. (2014) *Etalons et Tables de Mesure À Délos Hellénistique: Évolutions et Ruptures*, in: *Dialogues d'histoire Ancienne* 14, no. 12, pp. 21-39.

Chantraine, P. et alii (1999) *Dictionnaire étymologique de la langue grecque : histoire des mots*, Paris : Klincksieck

Chapinal Heras, D. (2014) *El santuario de Dodona en el Epiro: economía, comercio y peregrinos en un espacio cultual*, in: del Cerro Linares, M. C.; Alonso Moreno, C. V.; González Herrero, O.; Per Gimeno, L.; Milán Quiñones de León, M. S.; Elices Ocón, J.; Mysłowska, A. and Viaña Gutiérrez, A. (edd.) *Economías, comercio y relaciones internacionales en el Mundo antiguo*, Barcelona: Fullcolor printcolor, D.L., pp. 201-218

Chelbi, F.; Paskoff, R. and Trousset, P. (1995) *La baie d'Utique et son évolution depuis l'Antiquité : une réévaluation géoarchéologique*, in: *Antiquités Africaines*, 31, 1, pp. 7-51

Christie, G. C. (1963-1964) *Vagueness and legal language*, in: *Minnesota Law Review*, issue 4, pp. 885-911

Ciaceri, E. (1927-1928) *Storia della Magna Grecia*, vols. 1 and 2; Città di Castello: Società editrice Dante Alighieri di "Albrighi, Segati, & C."

Cintas, P. (1951) *Deux campagnes de fouilles à Uttique*, in: *Carthago*, 2 (1951), pp. 5-88

Clarke, M. (2005) *Etymology in the semantic reconstruction of early Greek words*, in: *Hermathena*, vol. 179, pp. 13-38

Codish, S. and Schiffman, R. N. (2005) *A Model of Ambiguity and Vagueness in Clinical Practice Guideline Recommendations*, in: *AMIA Annual Symposium Proceedings Archive*, 2005, pp. 146-150

Cohen, E. E. (1973) *Ancient Athenian Maritime Courts*, Princeton: Princeton University Press

Coleman, L. and Kay, P. (1981) *The English Word Lie*, in: *Language*, vol. 57, no. 1, pp. 26-44

Coll Monteagudo, R. (2004) *Història arqueològica de Premià*, Premià de Mar: Ajuntament de Premià de Mar

Collinge, N. E. (1985) *The Laws of Indo-European*, Amsterdam / Philadelphia: John Benjamins Publishing Company

Cooper, J. P. (2011) *no easy option: the Nile versus the Red Sea in ancient and mediaeval north-south navigation*, in: Harris, W. V. and Iara, K. (edd.) *Maritime technology in the ancient economy: ship-design and navigation. Journal of Roman Archaeology, supplement series*, vol. 84, pp. 189-210

Corpus Inscriptionum Latinarum

Costa, M. D. and Ollé, A. (edd.) (2008) *Dossier. 100 anys d'excavacions arqueològiques a Empúries. Hipòtesis i certeses*, in: *Annals de l'Institut d'Estudis Empordanesos*, vol. 39, viewed online at: http://www.raco.cat/index.php/AnnalsEmpordanesos/issue/view/9899/showToc (accessed: June 2016)

Cottier, M. (2005) *The organisation of customs duties in Ptolemaic and Roman Egypt (circa 332 BC to AD 284)*, Oxford [thesis]

Cottier, M.; Crawford, M. H. and Wörrle, M. (2008) *the customs law of Asia*, Oxford: Oxford University Press

Counillon, P. *λιμὴν ἐρῆμος*, in Arnaud P. and Counillon P. (1998) *Geographica historica*, Bordeaux – Nice: Ausonius and Université de Nice Sophia-Antipolis, esp. pp. 55-67.

Cruse, D. A. (1986) *Lexical semantics*, Cambridge: Cambridge University Press

Crystal, D. (2008[6]) *A Dictionary of Linguistics and Phonetics*, Malden, MA ; Oxford : Blackwell; ebook version dating 2009 by Palo Alto, CA : ebrary

Cuntz, O. *Der Stadiasmus Maris Magni*, in: Bauer, A. and Cuntz, O. (edd.) *Chronik des Hippolytos*, Leipzig: J. C. Hinrichs'sche Bucchandlung, pp. 243-276

Cutting, J. (ed.) (2007) *Vague Language Explored*, Basingstoke and New York: Palgrave MacMillan

D'Arms, J. H. and Kopff, E. C., edd. (1980) *The seaborne commerce of ancient Rome*, in: *Memoirs of the American Academy in Rome*, vol. 36, Rome: American Academy in Rome

De Jong, I. J. F.; and Rijksbaron, A. (edd.) (2006) *Sophocles and the Greek language. Aspects of diction, syntax and pragmatics*, Leiden and Boston: Brill, esp. pp. 188-239

De Saint-Denis, E. (1935) *Le vocabulaire des manoeuvres nautiques en Latin*, Macon: Protat Frères, Imprimeurs

De Saussure, F. (1983) *Course in General Linguistics*, edited by Bally, C.; Sechehaye, A. and Riedlinger, A.; trans. Harris, R., London: Duckworth

De Soto, P. (2010) *Anàlisi de la xarxa de comunicacions i del transport a la Catalunya romana: estudis de distribució i mobilitat*, Barcelona (thesis)

De Soto, P. (2011) *La configuracion territorial del NO: análisis desde una perspectiva de la accesibilidad y los costes de transporte*, in: Carreras, C. and Morais, R. (edd.) *Ánforas romanas de Lugo. Comercio romano en el Finis Terrae* Lugo : Concello De Lugo, pp. 128-148.

Dear, I. C. B. and Kemp, P. (edd.) (2007²) *The Oxford Companion to Ships and the Sea*, Oxford: Oxford University Press

Delia, D. (1988) *The population of Roman Alexandria*, in: *Transactions of the American Philological Association*, vol. 18, pp. 275-292.

Delile, H.; Abichou, A.; Gadhoum, A.; Goiran, J.-P.; Pleuger, E.; Monchambert, J.-Y.; Wilson, A.; Fentress, E.; Quinn, J.; Ben Jerbania, I.; Ghozzi, F. (2015) *The Geoarchaeology of Utica, Tunisia: The Paleogeography of the Mejerda Delta and Hypotheses Concerning the Location of the Ancient Harbor,* in: *Geoarchaeology, an international journal*, vol. 30, issue 4, pp. 291-306 Enei, F. (2012) *Pyrgi Sommersa. Ricognizioni archeologiche subacquee nel porto dell'antica Caere*, Ariccia: Aracne Editrice

Dignas, B. (2002, reprinted 2004) *Economy of the sacred in Hellenistic and Roman Asia Minor*, Oxford: Oxford University Press

Dörpfeld, W. and Goesler P. (edd.) (1927) *Alt-Ithaka: ein Beitrag zur Homer-Frage; Studien und Ausgrabungen auf der Insel Leukas-Ithaka*, Munic-Gräfelfing: Uhde esp. vol.

1 pp. 92-101. This book has been digitised by the University of Heidelberg: http://digi.ub.uni-heidelberg.de/diglit/doerpfeld1927bd1

Dueck, D. (2000) *Strabo of Amaseia. A Greek man of letters in Augustan Rome*, London and New York: Routledge

Duff, T. E. (2003) *The Greek and Roman historians*, London: Bristol Classical Press

Dunbabin, K. M. D. (1978) *The Mosaics of Roman North Africa. Studies in Iconography and Patronage*, Oxford: Clarendon Press, p. 269, pl. XLVIII, fig. 119-120.

Durrbach, F. (1912) *Inscriptiones Graecae. XI. Inscriptiones Deli. Fasc. 2*, Berlin: Reimer

Easterling, P. E ; Knox, B. M. W. (edd.) (1989) *The Cambridge History of Classical Literature.* Vol. 1: *Greek literature*, Cambridge: Cambridge University Press

Edgar, C. C. (1923) *Selected papyri from the archives of Zenon*, in: *Annales du service des antiquités de l'Égypte*, 23, pp. 73-98.

Égré P. and Klinedinst, N. (edd.) (2011) *Vagueness and Language Use*, Basingstoke and New York: Palgrave MacMillan

Empereur, J.-Y. (1998) *Alexandria rediscovered*, London: British Museum Press

Ernout, A. and Meillet, A. (1932) *Dictionnaire étymologique de la langue latine*, Paris: Klinsieck

Faucher, T. (2013) *Frapper monnaie. La fabrication des monnaies de bronze à Alexandrie sous les Ptolemées*, Alexandria: Centre d'études alexandrines du CNRS

Ferro, I. (2008) *Studi antiquari e ricerca archeologica. Il porto di Hipponion-Valentia*, in: G. Floriani, G. and D'Andrea, M. (edd.) *Collezioni storiche. Storie di collezioni. Erudizione e tradizione antiquaria a Monteleone di Calabria*, Soveria Mannelli: Rubbettino, pp. 255-266

Finzenhagen, U. (1939) *Die geographische Terminologie des Griechischen*, Würzburg-Aumühle: Druckerei wissenschaftlicher Werke Konrad Triltsch, esp. pp. 47-146

Fischer, E. (1880) *Das 8. Buch vom Gallischen Kriege und das Bellum Alexandrinum*, Passau, J. Bucher; viewed online in a digitised copy at: https://archive.org/details/dasachtebuchvon00fiscgoog (accessed June 2016)

Fisiak, J. (1988) *Historical dialectology, regional and social*, Berlin, New York and Amsterdam: Mouton de Gruyter

Fletcher, J. (2008) *Cleopatra the Great, the woman behind the legend,* London: Hodder and Stoughton

Fögen, M.T. (1990) *Das Lexikon zur Hexabiblos aucta. Forschungen zur byzantinischen Rechtsgeschichte*, vol. 17, Frankfurt am Main: Löwenklau Gesellschaft

France, J. and Hesnard, A. (1995) *Une statio du quarantième des Gaules et les operations commerciales dans le port romain de Marseille (place Jules Verne)*, in: *Journal of Roman Archaeology*, 8, pp. 79-93

Franzot, S. (1999) *Aquileia e altri porti romani. Analisi della terminologia portuale nelle iscrizioni romane*, Monfalcone: Centro Stampa snc, Gruppo Archeologico Aquileiese

Fraser, P. M. (1961) *The ΔΙΟΛΚΟΣ of Alexandria*, in: *The Journal of Egyptian Archaeology*, 47, pp. 134-138

Fraser, P. M. (1972) *Ptolemaic Alexandria*, Oxford: Clarendon Press

Fraser, P. M. (1996) *cities of Alexander the Great*, Oxford: Clarendon Press, reprinted 2003

Fronda, M. P. (2010) *Between Rome and Carthage. Southern Italy during the Second Punic War*, Cambridge: Cambridge University Press.

Frost, H. (1963) *From rope to chain. On the developement of anchors in the Mediterranean*, in: *Mariner's Mirror*, 49:1, pp. 1-20

Frost, H. (1972) *Ancient harbours and anchorages in the eastern Mediterranean*, in: *Underwater archaeology: a nascent discipline*, Museums and Monuments, 13, Paris: Unesco pp. 95-114.

Frost, H. (1975) *The Pharos site, Alexandria, Egypt*, in: *International Journal of Nautical Archaeology*, 4.1, pp. 126–130

Fumagalli, V. (1994) *Landscapes of Fear. Perceptions of Nature and the City in the Middle Ages*, transl. Mitchell, S., Cambridge: Polity Press

Gabrielsen, V. (1994) *The Rhodian associations honouring Dionysodoros from Alexandria*, in: *Classica et Medievalia*, vol. 45, pp. 137-160.

Gabrielsen, V. (2001) *Economic activity, maritime trade and piracy in the Hellenistic Aegean*, in: *Revue des Études anciennes*, 103, nº 1-2: *les îles de l'Égée dans l'Antiquité. Bordeaux, 12-13 novembre 1999*, pp. 219-240

Gagarin, M. (ed.) (2010) *The Oxford Encyclopedia of Ancient Greece and Rome*, 7 voll., Oxford: Oxford University Press

Gallina Zevi, A. and Turchetti, R., edd. (2004) *Le strutture dei porti e degli approdi antichi*, Soveria Mannelli : Rubbettino

García Bellido, A. (1964) *Hercules Gaditanus*, in: *Archivo Español de Arqueología*, 36, pp. 70-153

Garcia Casacuberta, N. (2015) *Cui bono? Per què els grecs escrivien sobre ports*, in: *Auriga*, 76, pp. 4-8

Garcia Casacuberta, N. (2017) *Características del «aigialos» según los autores médicos / Characteristics of the «aigialos» according to the medical authors*, in: De la Villa Polo et al. (edd.) *Conventus Classicorum*, vol. II, Madrid, pp. 207-214

Gauthier, Th. (1972) *Symbola. Les Étrangers et La Justice Dans Les Cités Grecques*, Nancy: Annales de l'Est publiées par l'Université de Nancy.

Geeraerts, D. (1989) *Prospects and problems of prototype theory*, in: *linguistics*, 27, pp. 587-612

Gernet, L. (1938) *Sur les actions commerciales en droit athénien*, in: *Revue des Études Grecques*, vol. 51, fasc. 239, pp. 1-44

Giaime, M.; Morhange, C.; Carayon, N.; Flaux, C. and Marriner, N. (forthcoming) *les ports antiques des petites îles de Mediterranée. Proposition d'une typologie géoarchéologique*, in: Ghilardi, M. (ed.) *Géoarchéologie des îles de Méditerranée*

Giardina, B. (2010) *Navigare necesse est. Lighthouses from Antiquity to the Middle Ages*, Oxford: Archaeopress

Gilhuly, K. and Worman, N. (edd.) (2014) *Space, Place and Landscape in Ancient Greek Literature*, New York: Cambridge University Press

Goddio, F. (1995) *Cartographie des vestiges archéologiques submergés dans le Port Est d'Alexandrie et dans la Rade d'Aboukir*, in Bonacasa, N., Naro, C., Portale, E. C., Tullio,

A. (1995) *Alessandria e il mondo ellenistico-romano. Alessandria, 23-27 Novembre 1992,* Roma: L'erma di Bretschneider

Goddio, F.; Bernand, A.; Bernand, E.; Darwish, I.; Zsolt, K.; Yoyotte, J. (1998) *Alexandria. The submerged royal quarters*, London: Periplus

Goold, G. P. (1995) *Chariton. Callirhoe*, Cambridge, MA : Harvard University Press

Gradilone, A. (1967²) *Storia di Rossano*, Cosenza: Editrice MIT, esp. pp. 13-37

Greco, E. (1992) *Archeologia della Magna Grecia*, Bari: Laterza

Grenfell, B. P. (1896) *Revenue Laws of Ptolemy Philadelphus*, Oxford: Clarendon Press

Grenier, A. (1959) *Carte archéologique de la Gaule romaine*, fasc. XII: *Aude,* Paris: Académie des Inscriptions et Belles-Lettres

Grimm, G. (1998) *Alexandria. Die erste Königsstadt der hellenistischen Welt*, Mainz am Rhein: Philipp von Zabern

Guarducci, M. (1935-1950) *Inscriptiones Creticae*, 4 voll., Rome: Libreria dello Stato

Hague, D. B. (1973) *Lighthouses*, in: Blackman, D. J. (ed.) *Marine Archaeology. Proceedings of the twentythird symposium of the Colston Research Society held in the University of Bristol April 4th-8th 1971,* London: Butterworths, pp. 293-316

Hairy, I., ed. (2009) *Du Nil à Alexandrie: histoires d'eaux,* Alexandria: Editions Harpocrates, esp. pp. 114-161

Hajibayova, L. (2013) *Basic level categories: a review*, in: *Journal of Information Science*, XX (X), pp. 1-13

Halfmann, H. (1986) *Itinera Principum. Geschichte und Typologie der Kaiserreisen im Römischen Reich*, Stuttgart: Franz Steiner Verlag

Hall, L. G. H. (1996) *Hirtius and the Bellum Alexandrinum,* Classical Quarterly, vol. 46, issue 2, pp. 441-415.

Harmand, J. (1973) *une composante scientifique du Corpus Caesarianum. Le portrait de la Gaule dans De Bello Gallico I-VII*, in: *Aufstieg und Niedergang der Römischen Welt*, vol. 1.3, pp. 523-595, Berlin: De Gruyter

Harris, W. V. and Ruffini, G. (edd.) (2004) *Ancient Alexandria between Egypt and Greece*, Leiden, Boston : Brill

Hercher, R. (1873) *Epistolographi Graeci,* Paris: Didot (repr. Amsterdam: Hakkert, 1965)

Hermary, A.; Hesnard, A. and Tréziny, H. (1999) *Marseille Grecque. La cité phocéenne (600-49 av. J.-C.)*, Paris: Éditions Errance

Hernández Campoy, J. M. and Conde Silvestre, J. C. (edd.) (2012) *the handbook of historical sociolinguistics*, Chichester, West Sussex, UK; Malden, MA: Wiley-Blackwell

Hersh, H. M. and Caramazza, A. (1976) *A fuzzy set approach to modifiers and vagueness in natural language*, in: *Journal of Experimental Psychology: General*, 105(3), pp. 254-276

Hoad, T. F., ed. (1996) *The Concise Oxford Dictionary of English Etymology*, Oxford: Oxford University Press

Holum, K. G.; Raban, A. and Patrich, J. (edd.) (1999) *Caesarea papers 2: Herod's temple, the provincial governor's praetorium and granaries, the later harbor, a gold coin hoard, and other studies*, in: *Journal of Roman Archaeology*

Hopkins, L. D. C. (2014), *Fleets and Manpower on Land and Sea: the Italian "classes" and the Roman Empire 31 BC – AD 193*, Oxford (thesis)

Horbury, W. and Noy, D. (1992) *Jewish inscriptions of Graeco-Roman Egypt. With an index of Jewish inscriptions of Egypt and Cyrenaica*, Cambridge: Cambridge University Press; esp. pp. 1-34

Hornblower, S. and Spawforth, A. (1996[3]) *The Oxford Classical Dictionary*, Oxford: Oxford University Press

Horrocks, G. (1997) *Greek. A History of the Language and its Speakers*, New York: Addison Wesley Longman Inc.

Horsefall, N. (1981) *the battle of Actium: myth and reality*, Sydney: N. S. W.

Horsfall, N. (1985) *Illusion and reality in Latin topographical writing*, in: *Greece and Rome*, 32, pp. 197-208, viewed online at: http://www.jstor.org/stable/642442?seq=1#page_scan_tab_contents (accessed: June 2016)

Hurst, H. (2010) *Understanding Carthage as a Roman Port*, in: *Bolletino di archeologia on line*, 1, Volume speciale B / B7 / 6, pp. 49-68

Hutter, S. (1973) *Der römische Leuchtturm von La Coruña*, Mainz am Rhein: Philipp von Zabern

Iannelli, M. T.; Lena, G.; and Givigliano, G. P. (1992) *Indagini subacquee nel tratto di costa tra Zambrone e Pizzo Calabro, con particolare riferimento agli stabilimenti antichi per la lavorazione del pesce*, in: *V Rassegna Di Archeologia Subacquea. V Premio Franco Papò. Atti. Giardini Naxos 19-21 Ottobre 1990*, Messina: Edizioni P&M Associati, pp. 9-43

Izquierdo Tugas, P. (1990) *Liaisons entre navigation maritime et fluviale en Tarraconaise. Les exemples de Les Sorres et Dertosa*, in: *Le commerce maritime romain en Méditerranée Occidentale, (Barcelona, 1988)*, Louvain-la-Neuve, p.189-199.

Izquierdo Tugas, P. (2009 a) *Els ports del litoral tarraconense i el seu paper en el comerç del vi*, in *El vi tarraconense i laietà, ahir i avui*, Ajuntament de Teià - Institut Català d'Arqueologia Clàssica, Tarragona, p. 179-191.

Izquierdo Tugas, P. (2009 b) *Introducció a l'arqueologia portuària de la Tarraconense*, in *Manual d'Arqueologia Nàutica Mediterrània*, CASC-MAC, Girona, p. 443-455.

Jewish/non-Jewish relations. Palestinian Rabbis' Encounter with Graeco-Roman Paganism: Rabban Gamliel in the Bathhouse of Aphrodite in Acco: https://jnjr.div.ed.ac.uk/primary-sources/rabbinic/palestinian-rabbis-encounter-with-graeco-roman-paganism-rabban-gamliel-in-the-bathhouse-of-aphrodite-in-acco-m-a-z-34/, accessed: 24th May 2017

Jondet, G. (1916) *Les ports submergés de l'ancienne Île de Pharos*, Cario: Siège de l'Institud Égyptien

Jones, D. (2006) *The Bankers of Puteoli: finance, trade and industry in the Roman world*, Stroud: Tempus

Johnson, M. (2010[2]) *Archaeological Theory. An Introduction*, Chichester: Wiley-Blackwell

Katz, J. J. and Fodor, J. A. (1963) *The Structure of a Semantic Theory*, in: *Language*, 39, no. 2, pp. 170-210

Katzev, S. W. (2007) *The Ancient Ship of Kyrenia, Beneath Cyprus Seas*, in: Valavanis, P. and Hardy, D. (edd.) *Great Moments in Greek Archaeology*, Oxford: Oxford University Press, pp. 286-99

Keay, S. (2011), *Portus and the Alexandrian Grain Trade Revisited,* in Fentress, E. et al. (edd.): *XVII Conference of the Associazione Internazionale di Archeologia Classica (AIAC) (Rome 2008). Bolletino di Archeologia Online. Volume Speciale*, pp. 11-22; viewed online at: http://eprints.soton.ac.uk/336909/1/3_Keay_paper.pdf; accessed: 22nd Sept 2016.

Keay, S.; Earl, G.; Felici, F. et al. (2012) *Interim report on an enigmatic new Trajanic building at Portus*, in: *Journal of Roman Archaeology*, 2012, pp. 486-512

Kempson, R. (1986) *Ambiguity and the semantics-pragmatics distinction*, in: Travis, Ch. (ed.) *Meaning and interpretation*, Oxford: Blackwell, pp. 77-104

Kenawi, M. (2014) *Alexandria's Hinterland. Archaeology of the Western Nile Delta, Egypt*, Oxford: Archaeopress

Kenney, E. J ; Clausen, W. (edd.) (1982) *The Cambridge History of Classical Literature. Vol. 2: Latin literature*, Cambridge: Cambridge University Press

Kern, O. (1908) *Inscriptiones Graecae. IX,2. Inscriptiones Thessaliae*, Berlin: Reimer

Khalil, E. K. H. (2005) *Egypt and the Roman Maritime Trade. A focus on Alexandria*, 2 voll., Southampton (thesis), esp. vol. 1 pp. 109-122

Khalil, E. K. H. (2010) *The Sea, the River and the Lake: All Waterways Lead to Alexandria*, in: *Bollettino di Archeologia On Line*, 2010, pp. 33-48.

Knorringa, H. (1927) *Emporos. Data on trade and trader in Greek literature from Homer to Aristotle*, Amsterdam: H. J. Paris

Kowalski, J.-M. (2012) *Navigation et géographie dans l'Antiquité gréco-romaine : la terre vue de la mer*, Paris: Picard

Krebs, C. B. (2006) *"imaginary geography" in Caesar's Bellum Gallicum*, in: *The American Journal of Philology*, vol. 127, num. 1, pp. 111-136, viewed online at: https://www.jstor.org/stable/3804926?seq=1#page_scan_tab_contents (accessed: June 2016)

La Riche, W. (1996) *Alexandria, the sunken city*, London: Weidenfeld & Nicolson

Labov, W. (1972) *the boundaries of words and their meanings*, in: Bailey, C. J. and Shuy, R. (edd.) *New ways of analysing variation in English*, Washington DC: Georgetown University Press, pp. 340-373

Lamarque, P. and Olsen, S. H. (1994) *Truth, fiction, and literature: a philosophical perspective*, Oxford: Clarendon Press

Lamboley, J.-L. (1996) *Recherches sur les Messapiens. IVe-IIe siècle avant J.-C.*, Rome: École Française de Rome

Lancel, S. (1995, repr. 1997) *Carthage. A history*, Oxford: Blackwell, esp. pp. 172-192

Latorre Gonzalez-Moro, P. and Caballero Zoreda L. (1995) *Análisis arqueológico de los paramentos del faro romano llamado Torre de Hércules. La Coruña -España*, in: *Informes de la Construcción*, 46, pp. 47-50

Lehmann-Hartleben, K. (1923) *Die antiken Hafenanlagen des Mittelmeeres*, in Klio, Beiheft XIV Heft I.

Leider, E. (1934) *Der Handel von Alexandreia*, Hamburg: Niemann & Moschinski

Leidwanger, J. (2013) *Modeling distance with time in ancient Mediterranean seafaring: a GIS application for the interpretation of maritime connectivity*, in: *Journal of Archaeological Science*, vol. 40, issue 8, pp. 3302-3308

Lejeune, M. (1972) *Phonétique Historique du Mycénien et du Grec Ancien*, Paris: Klincksieck

Lena, G. (1989) *Vibo Valentia. Geografia e morfologia della fascia costiera e l'impianto del porto antico*, in: *Annali della Scuola Normale Superiore di Pisa. Classe di Lettere e Filosofia*, Serie III,Vol. 19, No. 2, pp. 583-607

Leonard, J. R. (1995) *Evidence for Roman ports, harbours and anchorages in Cyprus*, in Vassos Karageorghis and Demetrios Michaelides (edd.) *Proceedings of the International Sympposium Cyprus and the Sea*, Nicosia: University of Cyprus, Cyprus ports authority, pp. 227-246

Lézine, Alexandre (1968) *Carthage. Utique. Études d'architecture et d'urbanisme* Paris: éditions du centre national de la recherche scientifique, esp. pp. 79-155

Liddell, H. G.; Scott, R.; Jones, J. S. and McKenzie, R. (1996, reprint 9th ed.) *A Greek-English lexicon*, Avon: The Bath Press

Lombardo, M. (1989) *La via istmica Taranto-Brindisi in età arcaica e classica: problemi storici*, in: AA. VV., *Salento, porta d'Italia*, Galatina: Congedo, pp. 111-120

MacLaury, R. E. (1991) *Prototypes revisited*, in: *Annual review of Anthropology*, vol. 20, pp. 55-74

MacMullen, R. (1959) *Roman Imperial Building in the Provinces*, in: *Harvard Studies in Classical Philology*, 64, pp. 207-235

Marasco, G. (2003) *Greek and Roman Historiography in Late Antiquity : Fourth to Sixth Century A. D.*, Leiden and Boston, MA: Brill Academic Publishers

Marincola, J. (1997) *Authority and tradition in ancient historiography*, Cambridge: Cambridge University Press

Marotta, V. (1996) *La tutela dello scambio e comerci mediterranei in età arcaica e reppublicana*, in: *Ostraka. Rivista di antichità*, 4, pp. 157 – 167.

Marriner, N.; Morhange, C.; Flaux, C. and Carayon, N. (2017) *Harbours and ports, ancient*, in: Gilbert, A. S. (ed.) *Encyclopedia of Geoarchaeology*, pp. 382-403

Mataix Ferrándiz, E. (2014) *El edicto de incendio ruina naufragio rate nave expugnata (D. 47, 9, 1). Responsabilidad penal por cuestión de naufragio*, University of Alicante [thesis]

Matsui, T. (1998) *Pragmatic criteria for reference assignment: a relevance-theoretic account of the acceptability of bridging*, in: *Pragmatics and Cognition*, vol. 6, issue 1/2, pp. 47-98.

Mayer, M. (2011) *Caesar and the Corpus Caesarianum*, in: Marasco, G. (ed.), *Political Autobiographies and Memoirs in Antiquity. A Brill companion*, Leiden and Boston: Brill, pp. 189-232 (chapter 6).

McCormick, M. (2001) *Origins of the European economy: communications and commerce AD 300-900*, Cambridge: Cambridge University Press

McKenzie, J. (2007) *The architecture of Alexandria and Egypt, c. 300 B.C. to A.D. 700*, New Haven, Conn. ; London : Yale University Press

Medas, S. (2011) *il carattere portolanico dello Stadiasmus Maris Magni*, in: Harris, W. V. and Iara, K. (edd.) *Maritime technology in the ancient economy: ship-design and navigation. Journal of Roman Archaeology, supplement series*, vol. 84, pp. 161-177

Meijer, F. and van Nijf, O. (1992) *Trade, transport and society in the ancient world*, London and New York: Routledge

Mele, A. (1997) *Allevamento ovino nell'antica Apulie e lavorazione della lana a Taranto*, in: Moggi, M.; Cordiano, G. (ed.) *Schiavi e dipendenti nell'ambito dell' "oikos" e della "familia". Atti del XXII Colloquio Girea* Pisa: Edizioni ETS, pp. 97-104.

Merriam, A. C. (1883) *The Caesareum and the worship of Augustus at Alexandria*, in: *Transactions of the American Philological Association (1869-1896)*, vol. 14, pp. 5-35

Merritt, B. D. ; Wade-Gery, H. T. and McGregor, M. F. (1939-1953) *The Athenian Tribute Lists*, Princeton, N.J. : American School of Classical Studies at Athens

Miller, K. (1962) *die Peutingerische Tafel*, Stuttgart: F. A. Brockhaus Komm.-Gesch. GmbH

Millet, B. and Goiran, J.-P. (2007) *Impacts of Alexandria's Heptastadion on coastal hydro-sedimentary dynamics during the Hellenistic period: a numerical modelling approach*, in: *The International Journal of Nautical Archaeology*, 36.1, pp. 167-176

Milne, J. G. (1927, reprinted 1971) *Catalogue of Alexandrian coins*, New York: Sandford J. Dust Numismatic Publications

Mitchell, S. (1987) *Imperial building in the Eastern Roman provinces*, in: Macready, H. and Thompson, S. (edd.) *Roman architecture in the Greek World*, London: Society of Antiquaries, pp. 18-25

Moragas i Botey, J. (1995) *Famílies marineres de Premià*, Argentona: L'Aixernador

Morel, J.-P. (1978) *La Laine de Tarente,* in: *Ktema: civilisations de l'Orient, de la Grèce et de Rome antiques 3*, pp. 93-110

Morley, N. (2007) *Trade in Classical Antiquity*, Cambridge: Cambridge University Press

Morr, J. (1926) *Die Quellen von Strabons drittem Buch*, Philologus, Suppl. XVIII Heft III

Morton, J. (2001) *The role of physical environment in ancient Greek seafaring*, Brill: Leiden, Boston, Cologne

Mossé, C. (1970) *La colonisation dans l'antiquité*, Paris: Fernand Nathan

Murphy, M. L. (2003) *Semantic relations and the lexicon. Antonymy, synonymy, and other paradigms*, Cambridge: Cambridge University Press

Murray, W. (1995) *Ancient sailing winds in the Mediterranean. The case for Cyprus*, in: Karageorghis, V. and Michaelides, D. (edd.) *Proceedings of the International Symposium Cyprus and the Sea : Nicosia, 25-26 September 1993*, Nicosia: University of Cyprus, pp. 33-44

Nash, G. and Children, G. C. (2008) *The archaeology of semiotics and the social order of things*, Oxford: Archaeopress

Niebuhr, B. G. (1830) *A dissertation on the geography of Herodotus, with a map: Researches into the history of the Scythians, Getae, and Sarmatians*, Oxford: Talboys

Nieto, X. (1997) *Le commerce de cabotage et de redistribution*, in: Gianfrotta, P. A.; Nieto, X.; Pomey, P. and Tchernia, A. (edd.) *La Navigation dans l'Antiquité*, Aix-en-Provence: Edisud, pp. 146-159

Noy, D. (2000) *Foreigners at Rome, citizens and strangers*, London: Duckworth, with the Classical Press of Wales

Oleson, J. P. (1988) *The technology of Roman harbours*, in: *the international journal of nautical archaeology and underwater exploration*, 17.2 pp. 147-157

Osthoff, H. *Zur Geschichte des Perfects im Indogermanischen mit besonderer Rücksicht auf Griechisch und Lateinisch*, Strassburg: Trübner

Paganin, P.; Chiarini, L.; Bevivino, A.; Dalmastri, C.; Farcomeni, A.; Izzo, G.; Signorini, A.; Varrone, C.; Tabacchioni, S. (2013) *Vertical distribution of bacterioplankton in Lake Averno in relation to water chemistry*, in: *FEMS Microbiol Ecol*, 84 (1), pp. 176-188

Paoletti, M. and Settis, S. (edd.) (1981) *Medma e il suo territorio*, Bari: De Donato

Parker, A. J. (1992) *Ancient shipwrecks of the Mediterranean and the Roman provinces*, BAR International Series 580, Oxford: Tempus Reparatum

Pavis d'Escurac, H. (1976) *La Préfecture de l'Annone. Service administratif impérial d'Auguste à Constantin*, Rome: École Française de Rome

Peacock, D. P. S. and Williams, D. F. (1986) *Amphorae and the Roman economy. An introductory guide*, London and New York: Longman

Pedley, J. (2005) *Sanctuaries and the sacred in the ancient Greek world*, Hong Kong: Golden CUP.

Peters, W. (2003) *Metonymy as a cross-lingual phenomenon*, in: *Proceedings of the ACL 2003 workshop on Lexicon and figurative language*, vol. 14, pp. 1-9, accessed online at: http://dl.acm.org/citation.cfm?id=1118975&picked=prox [29th June 2017]

Petraccia Lucernoni, M. F. (2001) *Gli stationarii in età imperiale*, Roma: Giorgio Bretschneider

Petrucci, A. (1991) *Mensam exercere. Studi sull'impresa finanziaria romana (III secolo a.C. – metà del III secolo d.C.)*, Napoli: Jovene Editore

Philemonos-Tsopotou, M. (2004) *Η Ελληνιστική Οχύρωση της Ρόδου*, thesis, viewed online at http://thesis.ekt.gr/thesisBookReader/id/12587#page/6/mode/2up (accessed: 17th July 2017)

Pirson, F. (ed.) (2011) *Pergamon. Bericht über die Arbeiten in der Kampagne 2010*, in: Archäologisches Anzeiger, vol. 2, pp. 166-185

Platner, S. B. and Ashby, Th. (1929, reprinted 2015) *A topographical dictionary of Ancient Rome*, Cambridge: Cambridge University Press

Pokorny, J. (1994³) *Indogermanisches Etymologisches Wörterbuch*, 2 voll., Tübingen and Basel: Francke Verlag

Pomeroy, S. B.; Burstein, S. M.; Donlan, W. and Tolbert Roberts, J. (1999) *Ancient Greece: a political, social, and cultural history*, New York and Oxford: Oxford University Press

Pomey, P. (1982) *Le Navire Romain de la Madrague de Giens*, in: *Comptes-rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, 126 (1), pp. 133–154

Prontera, F., ed. (1983) *Geografia e geografi nel mondo antico. Guida storica e critica*, Bari: Laterza e figli

Prontera, F. (2013) *Timosthenes and Eratosthenes. Sea Routes and Hellenistic Geography*, in: Buraselis, K.; Stefanou, M.; and Thompson, D. J. (edd.) *The Ptolemies, the Sea and the Nile. Studies in Waterborne Power*, Cambridge: Cambridge University Press, pp. 207-217

Pòrtulas, J. (2008) *Introducció a la Ilíada. Homer entre la història i la llegenda*, Barcelona: Fundació Bernat Metge

Preiser-Kapeller, J. and Daim, F. (edd.) (2015) *Harbours and maritime networks as complex adaptative systems*, Mainz: Verlag des Römisch-Germanischen Zentralmuseums

Preisigke, F. et al. (1915) *Sammelbuch griechischer Urkunden aus Ägypten*, vol. 1, Strassburg: Trübner

Preucel. R. W. (2006) *Archaeological semiotics*, Oxford: Blackwell

Purcell, N. (2005) *The ancient Mediterranean: the view from the customs house*, in: Harris, W. V. (ed.) *Rethinking the Mediterranean*, New York: Oxford University Press, pp. 200-232

Purpura, G. (2005) *"Passaporti" romani*, in: *Atti dell'VIII Convegno Nazionale di Egittologia e Papirologia, Torino, 12 aprile 2003, Aegyptus. Rivista Italiana di Egittologia e Papirologia*, 82, 1-2, 2002 (pubbl. 2005), pp. 131-155

Purpura, G. (2013) *Alle Origini Delle Consuetudini Marittime Mediterranee. Symbola, Sylai E Lex Rhodia*, forthcoming.

Raban, A. and Holum, K. G. (edd.) (1996) *Caesarea Maritima. A retrospective after two millennia*, Leiden: Brill

Ramana, M. V.; Desa, M. A. and Ramprasad, T. (2015) *Re-examination of geophysical data off Northwest India: Implications to the Late Cretaceous plate tectonics between India and Africa*, in: *Marine Geology*, 365, 36-51

Reddé, M. (1986) *Mare Nostrum. Les infrastructures, le dispositif et l'histoire de la marine militaire sous l'Empire Romain*, Rome: École Française de Rome

Reed, C. M. (2004[2]) *Maritime traders in the ancient world*, Cambridge: Cambridge University Press

Reger, G. (1997) *The price histories of some imported goods on idependent Delos*, in: Andreau, J.; Briant, P. and Descat, R. (edd.) *Économie antique. Prix et formation des prix dans les économies antiques*, Saint-Bertrand-de-Comminges : Musée archéologique départmental, pp. 53-72

Reinach, Th. (1919) *Un code fiscal de l'Égypte romaine: le Gnomon de l'Idiologue*, in: *Nouvelle revue historique de droit français et étranger*, pp. 583-636

Reinach, Th. (1920) *Un code fiscal de l'Égypte romaine: le Gnomon de l'Idiologue (suite)*, in: *Nouvelle revue historique de droit français et étranger*, pp. 5-134

Rickman, G. (1971) *Roman granaries and store buildings*, Cambridge: Cambridge University Press

Rickman, G. (1980) *The corn supply of ancient Rome*, Oxford: Clarendon Press

Rix, H. (1951-1952) *Medma, Ort und Fluss in Bruttium*, in: *Beiträge zur Namenforschung*, 2, pp. 243-255

Robinson, D. and Wilson, A. (2011) *Maritime archaeology and ancient trade in the Mediterranean*, Oxford: Oxford Centre for Maritime Archaeology

Robinson, D. and Wilson, A. (edd.) (2010) *Alexandria and the North-Western Delta*, Oxford, Oxford Centre for Maritime Archaeology

Rosch, E. (1978) *Principles of Categorisation*, in: Rosch, E. and Lloyd, B. B. (edd.) *Cognition and Categorisation*, Hillsdale, NJ: Lawrence Erlbaum, pp. 27-48

Rosen, B.; Galili, E.; Zviely, D. (2012) *The Roman lighthouse at Akko, Israel*, in: *International Journal of Nautical Archaeology*, viewed online at: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1095-9270.2011.00329.x, last consulted 8[th] July 2018.

Rodziewicz, M. (1999) *Classification of Wineries from Mareotis*, in Empereur, J.-Y. (ed.) *Commerce et Artisanat dans L'Alexandrie Hellénistique et Romaine, Bulletin de Correspondance Hellénique*, Supplement 33, pp. 27-36

Romanelli, P. (1938) *Le grandi strade Romane nell'Africa settentrionale*, in: *Le grandi strade del mondo Romano*, XIII, Spoleto: Istituti di studi Romani editore

Rosén, H. B. (1987-1997) *Herodoti Historiae*, 2 voll., Stuttgart and Leipzig: Teubner

Ross, L. (1853) *Ausgrabung von Olympia: ein Vorschlag*, Braunschweig: Bruhn

Rossi, L. (2015) *Entre* gentes *putéolitaines et élite alexandrine: étude des acteurs du commerce au long cours dans l'Égypte romaine*, in: *Cahiers «Mondes Anciens»*, vol. 7, pp. 1-23; viewed online at: https://mondesanciens.revues.org/1556; accessed: 5th October 2016

Rostovtzeff, M. (1906) *Kornerhebung und –transport im griechisch-römischen Ägypten*, in *Archiv für Papyrusforschung*, 3, pp. 201-224

Rostovtzeff, M. (1932) *Foreign Commerce of Ptolemaic Egypt*, in *Journal of Economic and Business History*, vol. IV, pp. 728-769

Rothé, M.-P. and Tréziny, H. (edd.) (2005) *Carthe Archéologique de la Gaule. Marseille et ses alentours*, Paris: C.I.D.

Rougé, J. (1966) *Recherches sur l'organisation du commerce maritime en Méditerranée sous l'empire romain*, Paris: SEVPEN

Russell, B. (1923) *Vagueness*, in: *Australasian Journal of Psychology and Philosophy*, 1:2, pp. 84-92

Sacco, G. (1984) *Iscrizioni greche d'Italia. Porto*, Roma: Edizioni di storia e letteratura, esp. inscr. 2 pp. 12-13

Salway, B. (2004) *Sea and river travel in the Roman itinerary literatura*, in K. Brodersen, K. and Talbert, R.J.A. (edd.) *Space in the Roman World: its perception and presentation*, Münster: Lit Verlag, pp. 43-96

Salway, B. (2007) *The perception and description of space in Roman itineraries* in: Rathmann Philipp von Zabern, M. (ed.), *Wahrnehmung und Erfassung geographischer Räume in der Antike*, Mainz, pp. 181-209

Sanchez, C. and Jézégou, M.-P. (2011) *Espaces littoreaux et zones portuaires de Narbonne et sa región dans l'Antiquité*, Lattara: Publications de l'UMR 5140 du CNRS

Sanchez, C.; Jézégou, M.-P. and Pagès, G. (2012) *Entre littoral et arrière-pays, l'organisation des activités artisanales : le cas de Narbonne Antique*, in: Sanidas G. M.; Esposito A.: *Archéologie des espaces économiques : la concentration spatiale des activités*

et la question des quartiers spécialisés, Symposium des 16-17 décembre 2009, Lille: p. 347-360

Sánchez-Moreno Ellard, C. (2015) *Zur Gerichtsbarkeit des Praefectus annonae in D. 14.5.8 (Paul 1 decr.),* in: Panzram, S.; Riess, W. and Schäfer C. (edd.) *Menschen und Orte der Antike. Festschrift für Helmut Halfmann zum 65. Geburtstag*, Rahden: Verlag Marie Leidorf GmbH, pp. 361-376

Santmartí, E. (1996) *Bibliografia Emporitana*, in: *Cypsela*, XI - 1996, Girona: *Museu d'Arqueologia de Catalunya,* pp. 161-173

Schironi, F. (2014) *Technical languages: science and medicine,* in: Bakker, E. J. (ed.) *A companion to the Ancient Greek language*, Chichester: Wiley Blackwell, pp. 338-353

Schmiedt, G. (1981) *Ricostruzione geotopografica di Medma*, in: Paoletti, M. and Settis, S. (edd.) *Medma e il suo territorio*, Bari: De Donato, pp. 23-46

Schneider, E. E. (1984) *North Africa's Great Roman Road: from Alexandria to Gibraltar*, in: *Courier, publication of the United Nations (UNESCO)*, June 1984, pp. 7-9.

Schubart, W. (1912) *Griechische Inschriften aus Aegypten*, in: *Klio*, 12, pp. 365-376, esp. pp. 370-371.

Schuchhardt, C. (1912) *Historische Topographie der Landschaft*, in Conze, A. (1912) *Altertümer von Pergamon*, vol. I, Berlin: Reimer. Viewed online in the Heidelberger historische Bestände – digital: http://digi.ub.uni-heidelberg.de/diglit/pergamon1912

Sciarra, B. (1985) *Archeologia subacquea: risultati dell'attività svolta lungo il litorale brundisino*, in: *Actos del VI Congreso Internacional de Arqueología Submarina (Cartagena, 1982)*, Madrid: Ministerio de Educación, Cultura y Deporte, 1985

Semple, E. Churchill (1931) *The geography of the Mediterranean region: its relation to ancient history*, New York: H. Holt and company.

Shaw, T. (ed.) (1993) *The Trireme Project. Operational experience 1987-1990. Lessons learnt*, Exeter: The Short Run Press

Sia, T. (2014) *Da Medma a Rosarno*, published online at: *Calabria, il bel paese*: http://www.ilbelpaesecalabria.com/BENI%20CULTURALI/Da%20Medma%20a%20Rosarno.pdf, last accessed August 2017.

Sirks, A. J. B. (2010²) *Food for Rome. The legal structure of the transportation and processing of supplies for the imperial distributions in Rome and Constantinople*, Norderstedt: Books on Demand GmbH

Smith, N. J. J. (2001) *Vagueness*, Princeton: [thesis]

Smyth, H. W. *A Greek Grammar for Colleges*, viewed on-line at the website of the Perseus Project:
 http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0007

Sourvinou-Inwood, Ch. (1974) *The Votum of 477/6 B. C. and the Foundation Legend of Locri Epizephyrii*, in: *The Classical Quarterly*, 24.2, pp. 186-198

Steffy, R. J. (1985) *The Kyrenia Ship: An Interim Report on its Hull Construction*, in: American Journal of Archaeology, 38.1, pp. 71-101

Stemmler, M. (2000) *Auctoritas exempli*, in: Linke, B. and Stemmler, M. (edd.) *Mos maiorum. Untersuchungen zu den Formen der Identitätstiftung und Stabilisierung in der römischen Republik*, Stuttgart: Franz Steiner Verlag, pp. 141-205

Steskal, M. (2014) *Ephesos and its harbours. A city in search of its place*, in: Ladstätter, S.; Pirson, F.; Schmidts, Th. (edd.) *Häfen und Hafenstädte im östlichen Mittelmeerraum von der Antike bis in byzantinische Zeit / Harbors and Harbor Cities in the Eastern Mediterranean from Antiquity to the Byzantine Period*, vol. 1, Byzas 19, Istanbul: Ege Yayınları

Steskal, M. (2014) *Ephesos and its Harbours: A City in Search of its Place*, in: Landstätter, S.; Pirson, F. and Schmidts, Th. *Häfen und Hafenstädte im östlichen Mittelmeerraum von der Antike bis in byzantinische Zeit. Neue Entdeckungen und aktuelle Forschungsansätze*, vol. 1, Byzas 19, pp. 325-338

Stillwell, R. (ed) (1979²) *The Princeton encyclopedia of Classical sites*, Princeton, New Jersey : Princeton University Press

Stock, F. et al. (2016) *Human impact on Holocene sediment dynamics in the Eastern Mediterranean – the example of the Roman harbour of Ephesus*, in: *Earth surface processes and landforms*, 41, pp. 980–996

Stoneman, R. (2010) *Books we might have known. Classical association presidential address 2010*, Sherbone: Remous Ltd.

Stroud, R. S. (1974) *An Athenian Law on Silver Coinage*, in: *Hesperia: The Journal of the American School of Classical Studies at Athens*, Vol. 43, issue 2, pp. 157-188

Tabeaud, M.; Pech, P. and Simon, L. (edd.) (1997) *Géo-méditer: géographie physique et Méditerranée : hommage à Gaston Beaudet et Étienne Moissenet*, Paris: Publications de la Sorbonne

Talbert, J. A. (ed.) (2000), *Barrington atlas of the Greek and Roman world*, 3 voll., Princeton, N.J. ; Oxford : Princeton University Press

Tarn, W. W. (1931) *The battle of Actium*, in: *The Journal of Roman Studies*, vol. 21, pp. 173-199,   viewed   online   at: https://www.jstor.org/stable/296516?seq=1#page_scan_tab_contents (accessed June 2016).

Taylor, J. R. (2003) *Cognitive models of polysemy*, in: Nerlich, B.; Todd, Z.; Herman, V.; and Clarke, D. D. (edd.): *Polysemy: flexible patterns of meaning in mind and language*, Berlin and New York: Mouton de Gruyter, pp. 31-47

Tchernia, A. (2011) *Les Romains et le commerce*, Naples: Centre Jean Bérard and Centre Camille Jullian

Tecumseh Fitch, W. (2010) *the evolution of language*, Cambridge: CUP

Tecumseh Fitch, W. and Fitch, G. W. (2012) *language evolution. Critical concepts in linguistics*, Oxon: Routledge

Theodoulou, Th. (2007) *Η ναυτική δραστηριοτητα στην κλασική Κύπρο και το λιμενικό δίκτυο στα τέλη του 4ου αι. π.Χ.*, Leucosia: [thesis]

Tiwari, W. M.; Muppidi, R. and Mishra, D. C. (2013) *Long wavelength gravity anomalies over India: Crustal and lithospheric structures and its flexure*, in: *Journal of Asian Sciences*, 70-71, pp. 169-178.

Tkaczow, B. (1993) *Topography of ancient Alexandria (an archaeological map)*, Warsaw: Centre d'archéologie méditerranéenne de l'Académie polonaise des sciences

Tomlinson, R. A. (1976) *Greek sanctuaries*, London: Paul Elek

Torr, C. (1894, reprinted 2013) *Ancient ships*, Cambridge: Cambridge University Press.

Tran, N. (2006) *Les membres des associations romaines. Le rang social des collegiati en Italie et en Gaule sous le haut-empire*, Rome: École Française de Rome

Tran, N. (2011) *Les collèges professionnels romains: «clubs» ou «corporations»?*, in: *Ancient Society*, 41, pp. 197-219

Tréheux, J. and Charneux, P. (1998) *Décret des Athéniens de Délos en l'honneur d'un épimélète de l'île*, Bulletin de correspondance hellénique, vol. 122, livraison 1, pp. 239-276.

Uebel, F. (1964) *μονοπωλία φακῆς. Ein bisher unbezeugtes Handelsmonopol frühptolemaischer Zeit in einem Jenaer Papyrus (P. Ien. Inv. 900)*, in: Wolski, J. (ed.): *Actes du Xe Congrès International de Papyrologie, Varsovie-Cracovie, 3-9 septembre 1961*, Warsaw: Zaklad narodowy imienia ossolinskich wydawnictwo polskiej akademii nauk pp. 165-181

Uggeri, G. (1977) *La Via Appia da Taranto a Brindisi. Problemi storico-topografici*, in: *Museo F. Ribezzo Brindisi, ricerche e studi*, vol. 10, pp. 169-202

Uggeri, G. (1988) *Il porto di Brindisi in età repubblicana*, in: Marangio, C. (ed.) *La Puglia in età repubblicana: atti del I Convegno di studi sulla Puglia romana, Mesagne, 20-22 marzo 1986*, Galatina: Congedo

Ungerer, F. and Schmid, H.-J. (1996) *An introduction to cognitive linguistics*, London: Longman, esp. chapter 2, pp. 60-113

van Nijf, O. M. (1997) *The Civic World of Professional Associations in the Roman East*, Leiden: Brill

Vélissaropoulos, J. (1977) *Le monde de l'emporion*, in: *Dialogues d'histoire ancienne*, vol. 3, pp. 61-85

Vélissaropoulos, J. (1980) *Les nauclères grecs. Recherches sur les institutions maritimes en Grèce et dans l'Orient hellénisé*, Geneva: Librairie Droz and Paris: Librairie Minard

Vendryes, J. (1938) *traité d'accentuation grècque*, Paris: Klincksieck

Venit, M. (2012) *Alexandria*, in: Riggs, Ch., ed.: *The Oxford Handbook of Roman Egypt*, Oxford: Oxford University Press, pp. 109-110

Verboven, K., and Laes, Ch. (edd.) (2016) *Work, labour and professions in the Roman World*, Leiden: Brill

Versluys, M.J. (2002) *Aegyptiaca Romana. Nilotic scenes and the Roman views of Egypt*, Leiden and Boston: Brill, esp. pp. 4-14

Visonà, P. (2016) *Controlling the Chora. Topographical Investigations in the Territory of Locri Epizephyrii (southeastern Calabria, Italy) in 2013-2015*, in: *FOLD&R FastiOnLine documents & research*, vol. 351, pp. 1-17; URL: http://www.fastionline.org/docs/FOLDER-it-2016-351.pdf, accessed: August 2017.

von Pauly, A. F.; Wissowa, G. et alii (1980) *Paulys Realencyclopädie der classischen Altertumswissenschaft*, Munich: Druckenmüller (work abbreviated *RE* in this thesis)

Votruba, G. F. (2014) *Iron Anchors and Mooring in the Ancient Mediterranean (until ca. 1500 CE)*, Oxford: [thesis]

Wachsmuth, C. (1904) *Das Hafenwerk des Rodiers Timosthenes*, in: *Rheinisches Museum für Philologie*, 59, pp. 471-473

Walbank, F. (2002) *Polybius, Rome and the Hellenistic word*, Cambridge : Cambridge University Press.

Walde, A. (1938³) *Lateinisches Etymologisches Wörterbuch*, 2 voll., Heidelberg: Carl Winter

Waltzing, J.-P. (1895) *Étude historique sur les corporations professionnelles chez les Romains depuis les origines jusqu'à la chute de l'Empire d'Occident*, Louvain: C. Peeters

Warne, A. G. and Stanley, D. J. (1993) *Archaeology to refine Holocene subsidence rates along the Nile delta margin, Egypt*, in: *Geology*, 21 (8), pp. 715-718

Warnking, P. (2016) *Roman trade routes in the Mediterranean Sea: Modelling the routes and duration of ancient travel with modern offshore regatta software*, in: Schäfer, Ch. (ed.) *Connecting the Ancient World. Mediterranean shipping, maritime networks and their impact*, Rahden: Marie Leidorf GmbH, pp. 45-90

Wawrzinek, C. (2014) *In portum navigare. Römische Häfen an Flüssen und Seen*, Berlin: De Gruyter

Wencel, M. (2011) *Making archaeology speak: Archaeology and Linguistics*, in: *Popular Archaeology*, vol. 3, viewed online at: http://popular-archaeology.com/issue/june-2011/article/making-archaeology-speak-archaeology-and-linguistics; accessed: 18th August 2016

Werner, W. (1997) *The largest ship trackway in ancient times: the Diolkos of the Isthmus of Corinth, Greece, and early attempts to build a canal*, in: *International Journal of Nautical Archaeology*, 26, pp. 98-117

Whitewright, J. (2008) *Maritime Technological Change in the Ancient World : invention of the lateen sail*, 2 voll. Southampton (thesis)

Whitewright, J. (2011) *The potential performance of ancient Mediterranean sailing rigs*, in: *The International Journal of Nautical Archaeology*, 40.1, pp. 2-17

Wilcken, U. (1924) *Papyrus-Urkunden*, in: *Archiv für Papyrusforschung und verwandte Gebiete*, vol. 7, pp. 288-314.

Williams, K. (2004) *Alexandria and the Sea. Maritime origins and underwater explorations*, Bloomington, In. : 1st Books Library

Wodtko, D. S. ; Irslinger, B. S. ; Schneider, C. (2008) *Nomina im Indogermanischen Lexikon*, Heidelberg : Winter

Woodward, J. (ed.) (2009) *the Physical Geography of the Mediterranean*, Oxford: Oxford University Press

Wörrle, F. (1971) *Ägyptisches Getreide für Ephesos*, in: *Chiron*, 1, pp. 325-340.

Wylde Swiny, H. and Katzev, M. L. (1973) *The Kyrenia shipwreck: a fourth-century B.C. Greek merchant ship*, in: Blackman, D. J. (ed.) *Marine Archaeology. Proceedings of the twentythird symposium of the Colston Research Society held in the University of Bristol April 4th-8th 1971*, London: Butterworths, pp.339-359

Yatromanolakis, D. (2009) *An archaeology of representations. Ancient Greek vase-painting and contemporary methodologies*, Athens: Institut du Livre, A. Kardamitsa

Yule, G. (1996) *Pragmatics*, Oxford: Oxford University Press

Zingerle, J. (1892) *Zur Frage nach der Autorschaft des Bellum Alexandrinum und dessen Stellung im Corpus Caesarianum*, in: *Wiener Studien*, 14, pp. 75-119

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Copenhaguen Associations Project:

    http://copenhagenassociations.saxo.ku.dk/

Diccionario griego-español, under the website of the CSIC:

    http://dge.cchs.csic.es/xdge/

Digital Fragmenta Historicorum Graecorum:

    http://www.dfhg-project.org/   [accessed: July and August 2017]

Droit Romain:

https://droitromain.univ-grenoble-alpes.fr/Corpus/digest.htm   [last   accessed: 4th
September 2017]

Enciclopèdia.cat:

    http://enciclopedia.cat/   [last accessed October 2017]

Oxford Reference:

    http://www.oxfordreference.com/

Papyri.info:

    http://papyri.info/

Tabula Imperii Byzantini:

    https://tib.oeaw.ac.at/index.php?seite=home

The Pelagios Project map:

    http://pelagios.org/peripleo/map

PHI Latin Corpus:

    http://latin.packhum.org/

Pleiades, a community-built gazetteer and graph of ancient places :

    http://pleiades.stoa.org/

The Suda on-line. Byzantine Lexicography:

       http://www.stoa.org/sol/

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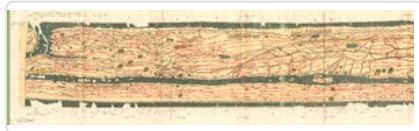Password:

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NASA has extensive image (https://www.instagram.com/nasa/) and video (https://www.youtube.com/NASA) galleries online, including historic images (https://www.flickr.com/photos/nasacommons), current missions (https://www.flickr.com/photos/nasahqphoto/), astronomy pictures (http://apod.nasa.gov/apod/astropix.html), and ways to search for NASA images (http://nasasearch.nasa.gov/search/images?affiliate=nasa&query=). Generally, each mission and program has a video and image collection on the topic page. For example, space station videos can be found at https://www.nasa.gov/mission_pages/station/videos/index.html (https://www.nasa.gov/mission_pages/station/videos/index.html). Content can also be found on our extensive social media channels (https://www.nasa.gov/socialmedia).

For questions about specific images, please call 202-358-1900. For questions about specific video, please call 202-358-0309.

NASA Content Used for Commercial Purposes

For more information on using NASA content for commercial purposes, please read NASA Advertising Guidelines (http://www.nasa.gov/audience/formedia/features/Advertising_Guidelines.html). Any questions

regarding use of NASA content, or any NASA image or emblem should be directed to Bert
Ulrich (mailto:bert.ulrich@nasa.gov) of the Multimedia Division of NASA's Office of
Communications at NASA Headquarters in Washington.

For information on NASA involvement in documentaries and films, please see documentary and
fictional film project guidelines.

If the NASA material is to be used for commercial purposes, including advertisements, it must
not explicitly or implicitly convey NASA's endorsement of commercial goods or services.

If a NASA image includes an identifiable person, using the image for commercial purposes may
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person.

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within the guidelines above. This permission does not extend to use of the NASA insignia, the
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As a government entity, NASA does not license the use of NASA materials or sign licensing
agreements. The agency generally has no objection to the reproduction and use of these
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motion picture photography), subject to the following conditions:

NASA material may not be used to state or imply the endorsement by NASA or by any NASA
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mislead. Please see NASA Advertising Guidelines
(http://www.nasa.gov/audience/formedia/features/Advertising_Guidelines.html) and
Merchandising Guidelines
(http://www.nasa.gov/audience/formedia/features/Merchandising_Guidelines.html) for more
information.

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reproduced and distributed without further permission from NASA.

If a recognizable person, or talent (e.g., an astronaut or a noted personality engaged to narrate appears in NASA material, use for commercial purposes may infringe a right of privacy or publicity. Permission should be obtained from the recognizable person or talent if the proposed use of the NASA material could be viewed as a commercial exploitation of that person. However, if the intended use of NASA material is primarily for communicative purposes, i.e., books, newspapers, and magazines reporting facts of historical significance (constitutionally protected media uses), then such uses will generally be considered not to infringe such personal rights.

Some NASA audiovisual material may incorporate music or footage, which is copyrighted and licensed for the particular NASA work. Any editing or otherwise altering of the work may not be covered under the original license, and therefore would require permission of the copyright owner.

NASA audiovisual material may include visible NASA identifiers (e.g., the name of the vehicle and the NASA Insignia or Logotype in photographs or film footage of ground vehicles, aircraft or spacecraft). Use of such materials is generally non-objectionable, provided the NASA identifiers appear in their factual context.

Documentary and Fictional Film Project Guidelines

NASA participates in scores of documentaries annually and a number of feature films as well. Participation ranges from providing imagery and footage to permitting on-site filming. Below describes the process of working with NASA on documentary and film projects.

Documentaries

NASA works only on projects which have a broadcaster/distributor and funding in place (beyond speculative phase). Once a project has a broadcaster/distributor and funding, NASA must review a treatment to determine NASA involvement and the scope of participation. Treatments can be submitted directly to bert.ulrich@nasa.gov (mailto:bert.ulrich@nasa.gov)

NASA does not accommodate sizzle reel productions.

NASA does provide publicly available film footage and imagery regardless of involvement in a particular production. This use is subject to the media use guidelines (http://www.nasa.gov/multimedia/guidelines/index.html) and advertising guidelines (http://www.nasa.gov/audience/formedia/features/Advertising_Guidelines.html).

NASA does not fund external documentary projects.

For interviews for documentaries, a release form is not required.

Feature film and fictional film projects

NASA participates only in projects which have funding and distribution in place.

A formal agreement is often required when there is a need to lay out what is expected of both parties in terms of shoots, clearances, protection of NASA's appearance in a fictional storyline, etc. An agreement may also be needed when the parties plan for an on-going collaboration for education or outreach activities beyond routine appearances or interviews.

After providing a signed NASA Non-Disclosure Agreement, NASA reviews a script to assess participation in a project. In some cases, clearances for use of the NASA Insignia and other identifiers, footage, still imagery and other NASA assets; details of shoots; post assistance and when appropriate; outreach leading to release of the film; are also addressed.

NASA does provide publicly available film footage and imagery regardless of involvement in a similar production. This use is subject to the media use guidelines (https://www.nasa.gov/multimedia/guidelines/index.html) and advertising guidelines (http://www.nasa.gov/audience/formedia/features/Advertising_Guidelines.html).

https://www.nasa.gov/multimedia/nasatv/index.html) (https://www.nasa.gov/) Search (https://w

Commercial and promotional shoots

NASA does not permit shooting of promotional content such as television spots, commercials, etc. at NASA facilities. In some cases, filming can take place at an outside NASA visitor Center which is run by a commercial entity. Please refer to advertising guidelines (http://www.nasa.gov/audience/formedia/features/Advertising_Guidelines.html) for more information.

For more information, please contact Bert Ulrich at bert.ulrich@nasa.gov (mailto:bert.ulrich@nasa.gov)
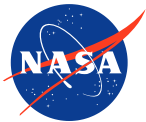
(https://www.nasa.gov/)

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FOIA (http://www.nasa.gov/FOIA)

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Office of Inspector General (http://oig.nasa.gov/)

Office of Special Counsel (http://osc.gov/)

Agency Financial Reports (http://www.nasa.gov/news/budget/index.html)

Contact NASA (http://www.nasa.gov/about/contact/index.html)

Re: copyright permissions

Keay S.J.
Sent: 08 August 2018 18:56
To: Garcia Casacuberta N.

Hi Nuria

As this is not a formal publication, that will be fine. If it were, it would be the BSR rather than me who would need to give permission.

Best

Simon

Professor Simon Keay FBA
Director, ERC Advanced Grant Project Portuslimen (RoMP) (www.portuslimen.eu)
Director, Portus Project (www.portusproject.org)
Research Professor British School at Rome

From: "Garcia Casacuberta N." <ngc1g14@soton.ac.uk>
Date: Wednesday, 8 August 2018 at 18:15
To: "S. Keay" <S.J.Keay@soton.ac.uk>
Subject: copyright permissions

From: Garcia Casacuberta N.
Sent: 03 August 2018 18:11
To: Keay S.J.
Subject: copyright permissions

Hello Simon,

I hope you are fine. I am gathering my copyright permissions at the moment and I was wondering if you could give me written permission to include your Portus map in my thesis, please? The map is Keay et al. (2012, fig. 2.5).

Many thanks!

Núria Garcia Casacuberta

PhD
Literary Sources on Graeco-Roman Mediterranean Ports
Portus Limen Project - www.portuslimen.eu
University of Southampton

RE: permission to reproduce maps in PhD thesis

Judith Mckenzie [judith.mckenzie@classics.ox.ac.uk]

Sent: 03 August 2016 12:48
To: Garcia Casacuberta N.; judith.mckenzie@arch.ox.ac.uk
Categories: Red Category

That'a fine.
Judith

_____

From: Garcia Casacuberta N. [ngc1g14@soton.ac.uk]
Sent: 03 August 2016 12:33
To: judith.mckenzie@arch.ox.ac.uk
Subject: permission to reproduce maps in PhD thesis

Dear Madam,

My name is Núria Garcia Casacuberta, and I am a PhD student at the University of Southampton. I am contacting you to seek permission to include the following material within the electronic version of my PhD thesis, which is due to be finished around September, 2017.

The materials are some maps that are included in the following book:

The Architecture of Alexandria and Egypt, 300 B.C. - A.D. 700 (Pelican History of Art, Yale University Press, London 2007; Paperback 2010).

The maps I would like to include are:

1.   Figure 35 (p. 33, 2010 paperback version)

2.   Figure 298 (p. 174, 2010 paperback version)

3.   Figure 28 (p. 26, 2010 paperback version)

All materials will, of course, be identified as belonging to your publication.

If you are not the rights holder for this material I would be grateful if you would advise me who to contact.

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Thank you for your attention.

Yours faithfully,

Núria Garcia Casacuberta

PhD Candidate
Literary Sources on Graeco-Roman Mediterranean Ports
Portus Limen Project (RoMP) - www.portuslimen.eu<http://www.portuslimen.eu/>
University of Southampton