A LANDSCAPE OF CONFLICT?

RURAL FORTIFICATIONS IN THE ARGOLID (400 – 146 BC)

VOLUME I

PART 1: TEXT

Thesis submitted for the Degree of Doctor of Philosophy

in Classical Archaeology

Anna Magdalena Blomley

Corpus Christi College, Oxford

Trinity Term 2018

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ABSTRACT

This thesis presents the first systematic study of rural fortified structures in the Argolid between 400 and 146 BC. By placing these fortifications in the context of their surrounding landscape, this study aims to cast new light on the sites' "military-strategic" and "civilian" functions and explores their implications for wider political, social and economic structures in the region and beyond. Methodologically, the study combines traditional approaches (e.g. architectural comparisons and extensive on-site observation) with GIS-based methods of data collection, visualisation and analysis.

The thesis is structured in eight chapters. The introductory **chapter 1** discusses the study's chronological framework, geographical scope, aims and structure, as well as the history of the scholarship on this subject.

Chapters 2–4 "set the scene" for the analysis of fortified sites in the Argolid. **Chapter 2** works towards reconstructing the region's ancient environment, discussing important landscape changes such as erosion, alluviation and coastline developments, as well as the available evidence for ancient vegetation and land use. **Chapter 3** lays out the typology of ancient fortifications employed in this study, while **chapter 4** aims to create the first systematic framework for dating fortified sites in the Argolid.

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In chapters 5–7, the study turns to the analysis of the Late Classical and Hellenistic rural fortifications in the Argolid. **Chapter 5** discusses the region's political structure and settlement patterns, **chapter 6** explores the fortifications' "strategic military" role, and **chapter 7** considers the structures' possible significance beyond a strictly "military-strategic" function, especially as places of refuge, habitation, production and agricultural processing.

Chapter 8 concludes the study with a summary of the main results, before discussing their significance for the wider field of research and exploring the future potential of GIS-based methods of data analysis in the Argolid and beyond.

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NOTE TO THE READER

a. On the transliteration of Greek toponyms, personal names and pottery terms

This study uses the following spelling conventions: Modern Greek toponyms (including all toponyms used to refer to specific ancient fortifications in the Argolid) are transliterated according to the guidelines for contributors to the Annual of the British School at Athens,[1] while ancient toponyms, political communities and larger regions are referred to by the names that are in general use in anglophone scholarship (e.g. Athens, Corinth and the Peloponnese). This means that different spellings of the same toponym are used to describe an archaeological site and the associated ancient community. For example, "Mykinai" and "Asini" refer to archaeological sites, while "Mycenae" and "Asine" denote the associated ancient political communities. If alternative spellings for the same toponym are in general use in anglophone scholarship (e.g. "Kleonai" and "Cleonae"), the form that is closer to the Greek (in this case "Kleonai") is given preference over the latinised version ("Cleonae"), with the exceptions of "Attica", "Carthage", "Corinth", "Crete", "Cyclades", "Cyprus", "Mycenae" and "Syracuse".

For personal names, this study also uses different spelling conventions for ancient and modern names: modern personal names are not transliterated, while ancient authors are referred to by the form conventionally used in anglophone publications (for example Herodotus instead of Herodotos and Plutarch instead of Plutarchos).

For objects, especially pottery shapes, the conventional scholarly names are used, choosing spellings with "k" rather than spellings with "c" (e.g. "krater" not "crater") and if applicable using the plural ending "-ai" instead of "-ae" (e.g. "lekanai" not "lekanae"). The only exception is the plural of "amphora", which will be spelt "amphorae".

[1] http://journals.cambridge.org/images/ileUpload/documents/ATH_Guidelines_for_Contributors.pdf (14/10/2015).

b. On sites names and catalogue numbers

In the Argolid, ancient sites are often known under different names. In this study, each fortification is referred to under one main toponym (in transliteration as discussed above) and the catalogue number in parentheses. In the maps, the sites are labelled by catalogue number. Alternatives toponyms are not mentioned in the thesis itself, but are listed in the descriptive catalogue.

c. The descriptive catalogue

A descriptive catalogue of fortified sites in the Argolid is included as an appendix at the end of this thesis. It is divided into five sections: "A. Fortifications in the Argolid"; "B. Possible Fortifications in the Argolid"; "C. Fortifications and Possible Fortifications in the Argolid: Location Unknown"; "D. Fortifications and Possible Fortifications in the Argolid: Now Destroyed"; and "E. Structures Erroneously Identified as Ancient Fortifications in the Argolid".

For each site, the catalogue includes the following information (if known): the main modern toponym, alternative modern toponyms, the ancient name, the location, the type of fortification, the approximate size, the masonry style, the date of visit, a short description of the site, its finds and its chronology, further information (such as the site's visibility or its historical context) and a short bibliography.

CHAPTER 1: INTRODUCTION

1.1 Approaching a landscape of conflict

The modern Argolid is a very striking region, characterised by a stark contrast between the Argive plain and the surrounding mountain ranges (**figure 1**). Owing to the numerous valleys around the central plain, the area forms one of the key crossroads between different regions of the Peloponnese and mainland Greece.[2] At the same time, the Argive plain was regarded both in antiquity and in later periods as particularly fertile.[3]

Over the centuries, the inhabitants of the Argolid paid a heavy price for this strategically and economically desirable location — the brutal Spartan destruction of Argive Hysiai in 417 BC,[4] Pyrrhus' attack on Argos in 272 BC,[5] the events vividly documented at the 6th-century AD refuge cave at Andritsa,[6] the Battle of Dervenakia during the Greek War of Independence[7] and the German occupation in 1943–1944[8] are just some of the past conflicts to have affected this particular region. Even today, the Argolid's landscape bears witness to past conflicts and is visually dominated by fortified structures, from the Bronze Age citadels of Mycenae, Midea and Tiryntha, over the Byzantine, Venetian and Ottoman walls on Argos' Larissa and Nafplio's Palamidi hill to the more recent concrete constructions that guard the northern entrance to the Argive plain.

In this strongly fortified landscape, defensive structures from the Archaic, Classical or Hellenistic period seem few and far between and are often dwarfed by their

[2] The routes through the region will be discussed in detail in chapter 6.
[3] See for example Morgan and Whitelaw 1991, 80. For a detailed discussion of the Argolid's ancient landscape, see chapter 2.
[4] Thuc. 5.83; D. S. 12.81.1.
[5] Plut. *Pyrrh.* 31–4.
[6] Κορμαζοπούλου and Χατζηλαζάρου 2005.
[7] On the Battle of Dervenakia (1822), see for example Gallant 2015, 81–2.
[8] On the German occupation of the Argolid, see for example Kalyvas 2006, 254–329.

Bronze Age neighbours and predecessors. However, closer study reveals that this impression is misleading. In reality, nearly 150 fortified structures in the region can be associated (although sometimes only tentatively) with one or several periods of Classical antiquity. Most of these fortifications are located in rural areas and are visually not as prominent as the impressive urban defences mentioned above. In part, this may explain why these sites have so far received so little scholarly attention and were never collected in a single corpus or studied systematically. It is this lacuna that the present research aims to fill with the first regional study of ancient fortification in the Argolid.

1.2 Fortifications studies: a brief history of scholarship

Many of the Argolid's ancient fortifications first appear in the archaeological record through the writings of foreign travellers. An unusually early example is the 15th-century diary of Ciriaco de' Pizzicolli (also known as Cyriacus of Ancona),[9] but the majority of "travellers' reports" date to the 19th century.[10] Most travellers were eager to draw connections between military events mentioned by ancient authors and the archaeological remains they encountered in the landscape around them.[11] Their work thus

[9] See for example Diary V, 63–9 for a description of Ciriaco's visit to the fort at Agios Adrianos (3) in AD 1448. Wolters 1915, 91–100; Bodnar 1960, 63–4; Bodnar and Foss 2003, 335–9.

[10] The most important 19th- and early 20th-century travellers' reports are Gell 1810; 1817; Dodwell 1819; Gell 1823; Pouqueville 1826; Gell 1829; Leake 1830a; 1830b; Trant 1830; Le Puillon de Boblaye 1836; Forchhammer 1837; Ross 1841; Leake 1846; Wordsworth 1846; Curtius 1851; 1852; Forchhammer 1857; Rhankabes 1857; Vischer 1857; Clark 1858; Conze and Michaelis 1861; Bursian 1862; 1872; Μηλιαράκης 1886; Le Bas 1888; Philippson 1892; Παρασκευόπουλος 1895; Omont 1902; Frickenhaus and Müller 1911. Further useful resources are Steffen and Lolling 1884 (documenting archaeological sites in the vicinity of Mykinai (51)) and the unpublished notes of W. Wrede and K. Gebauer, now in the archive of the German Archaeological Institute at Athens. I am very grateful to the DAI and especially Anne Fohgrub for giving me the opportunity to access these documents.

[11] For example, the now-lost remains at Ellinon Lithari (113) on the Tretos pass were quickly associated with the "Tower of Polygnotus" mentioned in Plut. *Arat*. 6–7 (Curtius 1852, 512; Bursian 1872, 39). Tausend 2006, 19 followed this traditional identifications, whereas Bynum 1995, 60. 83–4. 99 argued for a location of this structure at Agios Sostis (5). Πίκουλας 1995, 177. 348–9; Πιτερός 1997a, 361 suggested yet another alternative identification of the "Tower of Polygnotus" with the tower of Phichtia: Limiko (58).

laid the foundations for a "military-strategic" approach to ancient rural fortifications, which still continues to influence Classical scholarship today. Pausanias' *Periegesis* also featured prominently in this early phase of research, so that further description of ancient fortifications can be found in 19th-century commentaries on this work.

Building on this early scholarship, further fortifications were located and recorded more recently in studies devoted to ancient road networks.[12] Most of these studies were based on extensive fieldwork, which until the advent of handheld GPS devices, satellite imagery and GIS-based data collection still largely followed the methods used by 19th-century travellers, relying heavily on local informants and ancient literary sources.

To the fortifications mentioned by early travellers, in commentaries or in studies of ancient road networks, we can add further fortified structures from regional site catalogues,[13] from the Αρχαιολογικόν Δελτίον, or from surface surveys such as the *Argolid Exploration Project* (mostly referred to as the *Southern Argolid Survey*, 1972 and 1979–82),[14] a survey of the plain of Astros (1976–9),[15] the *Laconia Rural Sites Project* (1983–88),[16] the *Berbati-Limnes Archaeological Survey* (1988–90),[17] and the *Nemea Valley Archaeological Project (NVAP*, 1984–1990).[18] Two further surveys have

[12] For example Pritchett 1980; 1982; Πίκουλας 1995; Jansen 2002; Tausend 2006; Marchand 2009a; 2009b.
[13] For example, Simpson 1965; Φαράκλας 1972a; 1972b; 1972c; 1973; Leekley and Noyes 1976; Simpson and Dickinson 1979; Foley 1988; Simpson and Hagel 2006. Most of these catalogues focus on Bronze Age sites.
[14] Jameson et al. 1994; Runnels et al. 1995.
[15] Goester 1983; 1993.
[16] Cavanagh et al. 1996.
[17] Wells et al. 1990; Wells and Runnels 1996.
[18] Wright 1990; Cloke 2016.

been conducted since the 1990s (the *Western Argolid Regional Project (WARP)* and the *Troizen Archaeology Project)*, but have so far not been published in detail.[19]

Largely thanks to these surveys, the volume of material published in the Argolid has increased significantly since the 1970s, both in terms of site numbers and the level of recorded detail. However, excavations at fortified sites in the Argolid remain rare and usually focus on city walls (for example at Argos (12),[20] Asini (14)[21] and Porto Cheli (64)[22]) rather than minor rural fortifications. Notable exceptions are L. Lord's 1930s excavations at various towers around the Argive plain[23] and the work carried out by the Swedish Archaeological Institute at the tower of Prosymna: Pyrgouthi (69) between 1995 and 1997.[24]

Unlike "travellers' reports", synthetic research that compares and discusses fortifications throughout the Greek world remained rare in the 19th and early 20th centuries,[25] with the notable exception of masonry studies.[26] It was not until the 1970s and 1980s that the study of ancient fortifications developed into an independent archaeological field. This turning point is marked by the publication of F.E. Winter's "*Greek fortifications*" (1971) — a work which together with A.W. Lawrence's more technical "*Greek aims in fortification*" (1979), J.P. Adam's "*L'Architecture militaire greque*" (1982) and A. McNicoll's "*Hellenistic fortifications from the Aegean to the Euphrates*" (1997), is still considered a standard textbook on Greek military architecture.

[19] For the *Western Argolid Regional Project* see Gallimore et al. 2017; http://westernargolid.org/?page_id=2 (5/7/2018), for the *Troizen Archaeology Project* Fouquet 2015; http://www.troizenarchaeology.com (5/7/2018).
[20] For a summary of work on the walls of Argos (12), see Marchetti 2013; Πιτερός 2013, for the recent excavations on the Aspis, see for example Philippa-Touchais and Touchais 2007; 2008; 2009; 2010; 2011; Philippa-Touchais and Fachard 2015; 2015; Philippa-Touchais 2016.
[21] Frödin 1938; Wells 1992; Penttinen 1996b.
[22] McAllister 2005.
[23] Lord 1938; 1939; 1941.
[24] Hjohlman et al. 2005.
[25] A rare exception is La Noë 1888.
[26] Wrede 1933; Säflund 1935; Scranton 1941.

Closely related to these synthetic studies are publications on the developments of Greek artillery and siege-craft, for example E.W. Marsden's "*Greek and Roman artillery from 399 B.C. to the 4th century A.D.*" (1969) and Y. Garlan's "*Recherches de poliorcétique greque*" (1974). More recently, publications that focus on particular types of fortified sites (e.g. F. Lang's "*Archaische Siedlungen in Griechenland. Struktur und Entwicklung*" (1996) and R. Frederiksen's "*Greek city walls of the Archaic period, 900–480 BC*" (2010)) or aim to provide a methodological synthesis of current fortifications studies (especially "*Ancient fortifications. A compendium of theory and practice*" edited by S. Müth et al. (2016)) were added to this list of synthetic works.

Besides such studies that discuss fortifications throughout the Greek world and beyond, regional fortification studies form a second main group of publications devoted to Greek fortified structures. Scholars had already begun to experiment with such approaches in the early 20th century,[27] but it was not until J. Ober's influential (and controversial) "*Fortress Attica. Defense of the Athenian land frontier, 404–322 B.C.*" (1985) and M.H. Munn's "*The defense of Attica. The Dema wall and the Boiotian War of 378–375 B.C.*" (1993) that regional approaches rose to prominence in ancient fortification research. Following J. Ober's work in Attica, further regional fortification studies were conducted in many parts of the Greek world, for example in Sicily,[28] Epeiros,[29] Achaia Phthiotis,[30] Phokis,[31] Arkadia,[32] Karia,[33] Central Anatolia,[34] Cyprus,[35]

[27] For example in Attica (Tillyard 1905) or Siphnos (Δραγάτσης 1920).
[28] Karlsson 1992.
[29] Dausse 2003; 2011.
[30] Chykerda 2010, 100–24; Chykerda et al. 2014a, 20–2; 2014b, 287–301.
[31] Typaldou-Fakiris 2004.
[32] Maher 2012; 2015; 2017a.
[33] Pimouguet-Pédarros and Geny 2000.
[34] Vergnaud 2012.
[35] Balandier 1999; 2002.

Crete,[36] Euboia,[37] Siphnos[38] and the Cyclades.[39] In many of these studies, fortified sites were viewed primarily as military-strategic defensive networks,[40] but recent publications (such as S. Fachard's work on the fortifications of Eretria[41]) suggest that interpreting rural fortified structures solely as "territorial defences" may be oversimplified. This tension between different regional approaches gives rise to one of the main questions addressed in the present study: what is the purpose of ancient fortifications in the Argolid? Were they constructed primarily or exclusively as "defensive networks" or did they also fulfil functions beyond a strictly speaking military-strategic role?

1.3 Defining the Argolid

To address this question, the first step is to define the area of study, both chronologically and geographically. As chapter 4 "*Dating Ancient Fortifications in the Argolid*" will show, the chronological scope of this study is largely dictated by the archaeological material itself, since the overwhelming majority of datable fortifications in the northeastern Peloponnese belong to the period between ca. 400 BC and the defeat of the Achaean League in 146 BC. Defining the geographical framework of this study is, however, more challenging: what do we mean by the geographical term "the Argolid"?

Today, the modern Greek term "Argolida" or "Argolis" is used to denote one of the five regional units of the Peloponnese. It comprises the Argive plain, the surrounding

[36] Coutsinas 2011; 2013.
[37] Reber 2002; Fachard 2012; Chatzidimitriou and Chidiroglou 2014; Seifried and Parkinson 2014.
[38] Ashton 1991; Davies 1998; Birkett-Smith 2000.
[39] Louyot 2005; Louyot and Mazarakis Ainian 2005; Louyot 2008. Regional fortification studies were also the focus of several conferences, for example Leriche and Tréziny 1986; Maele and Fossey 1992; Brunet 1999; Kourtessi-Philippakis and Treuil 2011.
[40] See for example Maele 1982, 199–205; Fossey 1986, 135–41; Osborne 1987, 155; Fossey 1992, 128–30; Gauvin 1992, 145; Maele 1992, 106; Skorda 1992; Πίκουλας 1995; McInerney 1999, 343–6; Topouzi et al. 2002, 559–566.
[41] Fachard 2012.

mountain ranges and the greater part of the Akte peninsula, whereas the northeastern Akte, the peninsula of Methana and the islands of Poros, Hydra and Spetses are part of the adjacent Nison regional unit.

Originally, ἀργολίς is one of three adjectives that derive from the toponym Argos: ἀργολίς, ἀργολικός and ἀργεῖος.[42] All three terms first appeared as adjectives in connection with a noun (for example τὴν ἀργολίδα χώρην)[43], but by the second half of the 5th century BC Ἀργολίς and Ἀργεία had developed into toponyms in their own right.[44] By the Roman period, both terms were used not only for the territory of Argos,[45] but also for a wider region. For example, for Pausanias and Herodian Ἀργολίς (and in some instances Ἀργεία)[46] refers to an area that includes most of the northeastern Peloponnese,[47] while for Strabo and Ptolemy the Ἀργεία extends as far as the Kynouria.[48]

[42] The term ἀργολίς — usually only attested in the feminine form, rather than as the rare masculine ἀργόλας (for ἀργόλας, see for example E. *Rh*. 41; E. fr. 630 (*TrGF*); Ar. fr. 311 (*PCG*). Hoenigswald 1980, 105–6; Leukart 1994, 307–8; Piérart 2004, 599e) — is first attested in the 5th century BC (A. *Supp*. 236; E. *HF* 1016; Hdt. 1.82.2. 6.92.7), but remains rare until the Augustan period.
The ktetikon ἀργολικός (probably first attested in Hdt. 4.152.16) is more common and can be used to describe geographical features as well as objects (Hoenigswald 1980, 105; Piérart 2004, 599). For a use of ἀργολικός with geographical features (especially the Argolic Gulf), see for example Dem. 52.5; Scyl. 49.5, for a use with objects, see Hdt. 4.152.16. Unlike ἀργολίς, ἀργολικός is also attested in inscriptions, where it usually specifies metal objects (κρατῆρες Ἀργολικοί (*IG* II² 1424a (369/8 BC); *IG* II² 1425 (368/7 BC)); κυναῖ χαλκαῖ ἀργολ[ικαὶ (*SEG* ix 129 (352/1 BC)) or weight standards (δραχμὰς Ἀργολικοὺς (*IG* IV² I 97 (3rd century BC)). One exception is *Kaibel* 932 (235–200 BC) from Sidon, where ἀργολικός refers to the Nemean games. The ethnic ἀργεῖος is already attested in the Homeric epics, where it can be used metonymically for all the Greeks (Drews 1979, 116; Wathelet 1992, 105; Hall 1995a, 580; 1997, 90; Cingano 2004, 60; Piérart 2004, 599). On the Homeric use of the toponym Ἄργος for the city of Argos, the Argive plain, the Peloponnese and Greece as a whole, see Wathelet 1992, 99–105, although Drews 1979, 121–4 previously doubted that the term could denote the plain or the Peloponnese. From the 7th century BC onwards, ἀργεῖος also served as a proper city ethic (Piérart 2004, 599).
[43] Hdt. 6.92.7.
[44] For example, Thuc. 5.75.4; Plut. *Ages*. 31.6.4. Hirschfeld 1896a, 700; Hirschfeld 1896b, 728.
[45] Ἀργολίς: Plut. *Cat*. *Ma*. 24.8.3; Ἀργεία: Paus. 2.18.1.
[46] Paus. 2.1.1.
[47] Hdn. *De prosodica catholica*. 3.1.20. 3.1.279; Paus. 2.8.5. 3.23.6. 4.2.4. 8.1.2. 8.4.6. 10.9.10. 10.15.1. Hirschfeld 1896a, 700; 1896b, 728; Piérart 2004, 599.
[48] Ptol. *Geog*. 2.16.10; Str. 8.335. 8.369. 8.376. Hirschfeld 1896a, 700; 1896b, 728; Piérart 2004, 599.

When this concept of the Argolid as a geographical region rather than the territory of an individual city first developed is unclear. In the Homeric "*Catalogue of Ships*" the contingents of several cities in the modern Argolid (Argos, Tiryns, Hermion, Asine, Troizen, Eiones, Epidauros and Mases) are grouped together under the command of Diomedes.[49] However, this does not necessarily imply a concept of the Argolid as a coherent unit, since the contingencies commanded by Diomedes also include the island of Aigina, but not Mycenae or Kleonai (which are attributed to the realm of Agamemnon).[50] Even more importantly, it remains unclear how far the distribution of territories in the Homeric "*Catalogue of Ships*" is motivated by a poetic necessity to portray both Agamemnon and Diomedes as leaders over appropriate contingents, or whether it is an attempt to reconcile conflicting genealogical traditions.[51]

Beyond the Homeric epics, the only further possible indications that a concept of the Ἀργολίς or Ἀργεῖα as a geographical region may have existed in pre-Augustan literature come from the works of Thucydides, Aristotle and Diodorus. The three authors describe Hysiai, Nauplia, Mycenae and Orneai as situated in the Ἀργεῖα,[52] but since these

[49] Hom. *Il*. 2.559–568. On the identification of Mases, see Jameson et al. 1994, 467, for Eiones Jameson et al. 1994, 58–9. Marchetti 1998, 208–9 suggested that the Argos in the *Catalogue* should be identified with an Argos κατὰ Τροιζῆνα **(**Plin. *HN* 4.18; St. Byz. s.v. *Argos*; Eust. Γ.250.1465). This would make the territory under Diomedes' command more coherent, but should be treated with caution due to the late date of the sources for an Argos on the Akte.

[50] Hom. *Il*. 2.569–570. The settlement of Orneai mentioned in the *Catalogue* (Hom. *Il*. 2.571) is most likely not the Argive, but the Corinthian Orneai, which is probably located at modern Dorati (Marchand 2002a, 142–5).

[51] Wathelet 1992, 111–6; Jameson et al. 1994, 59; Piérart 2006, 12–3. While Simpson and Lazenby 1970, 70–1 suggested that "the very strangeness of the kingdom [...] in fact provides the best ground for believing that it does correspond to reality", Hall 1995a, 580; 1997, 90 has convincingly argued that the distribution of sites to Agamemnon and Diomedes is a result of the "grafting" of the Pelopid to the Argive genealogy.

[52] Hysiai (Thuc. 5.83.2), Nauplia (Arist. *HA*. 602a.6), Mycenae (D.S. 11.65.2) and Orneai (D.S. 16.39.4).

sites had already been incorporated into the Argive territory as *komai* or dependent city-states by the late 5th century BC,[53] the implication of these passages is not entirely clear.[54]

Politically, the area of the modern Argolid was divided from the Archaic period onwards between at least eleven city-states (Argos, Epidauros, Halieis, Hermion, Kleonai, Methana, Mycenae, Orneai, Phleious, Tiryns and Troizen),[55] as well as further communities that were over time incorporated into the territories of their neighbours (for example Asine and Nauplia).[56] Between the 8th and 5th centuries BC, Argos gradually developed into a dominant political centre in the western part of the region, so that by the Late Classical period the city's territory not only included the formerly independent settlements of Asine,[57] Nauplia,[58] Tiryns,[59] Mycenae,[60] Orneai[61] and Kleonai,[62] but possibly also parts of the Thyreatis.[63]

Unlike the western part of the modern Argolid, the ancient Akte — transected by the steep Aderes ridge — did not develop a dominant political centre during the Archaic, Classical or Hellenistic period, and, although the four Aktaian cities (Epidauros, Troizen,

[53] Piérart 2004, 602–3. 612–3.
[54] Pausanias might have been aware of an earlier name for the territory of Argos or the region ("τῇ νῦν Ἀργολίδι ὀνομαζομένῃ" (Paus. 2.15.4)).
[55] Piérart 2004, 600. 602–17.
[56] Piérart 2004, 600; 2006, 20–1.
[57] Asine was probably incorporated into the Argive territory during the late 8th century BC (Frödin 1938, 437; Kelly 1976, 44–6. 64–6; Piérart 2004, 600; Ratinaud-Lachkar 2004; Piérart 2006, 20–1).
[58] Kelly 1976, 45. 88–9; Piérart 2004, 602. The historicity of the Argive invasion of Nauplia is doubted by Hall 1995a, 583–4 due to the lack of evidence for a Spartan connection of the city (supposedly the Argives' motive for its destruction (Paus. 4.24.4. 4.27.8. 4.35.2; Str. 8.6.1)) and the insignificance of deep-water harbours in the Archaic period. Instead, Nauplia may have become a dependent polis (Piérart 2004, 602).
[58] Frödin 1938, 437; Kelly 1976, 44–6. 64–6; Piérart 2004, 600.
[59] Kelly 1976, 45–6; Piérart 2004, 615.
[60] Piérart 2004, 612.
[61] Piérart 2004, 612; Shipley 2018, 283.
[62] For the incorporation of Kleonai into the Argive territory, see section 5.1.
[63] The extent and chronology of the Argive control over the Kynouria and Thyreatis will be discussed in section 5.1. Herodotus' claim that Argos once controlled the western coast of the Gulf as far south as Cape Malea and the island of Kythera (Hdt. 1.82.2) is usually considered as unlikely (Kelly 1976, 40. 73. 116–7; Piérart 2004, 599).

Hermion and Halieis) often fought alongside each other,[64] disputes between them are equally attested.[65] The Kalaureian Amphictyony, probably founded before the middle of the 7th century BC,[66] originally included the cities of Hermion, Epidauros, Aigina, Athens, Prasiai (later replaced by Sparta), Nauplia (replaced by Argos) and the Boiotian Orchomenos,[67] but there is no evidence that it served political or military functions besides its cultic role.[68]

For the Classical and Hellenistic period, there is therefore very little evidence that the area referred to today as the "Argolid" was perceived as a geographical unit or a loose political confederation. Is it, however, possible that the area was associated in antiquity with a distinctive "ethnic group"? In the current context, the term "ethnic group" is used to denote a group of people that perceive themselves as socially and culturally distinct from other groups[69] and that can be identified in the historical and archaeological record by a number of distinctive "markers". For example, members of an ethnic group are usually united by a collective name, a common myth of descent, a shared history, a distinctive shared culture (including language, religion and customs), an association with a specific territory, common sacred centres (recognised externally as well as internally) and a sense of solidarity.[70]

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[64] Hdt. 8.43. 8.72. 9.28.4. 9.31.3–4; Thuc. 1.27.2. 8.3.2; Xen. *Hell*. 4.2.16. 6.2.3. 7.2.2.
[65] *IG* IV^2. i 75 (early 2nd century BC); *IG* IV 751. 791 (late Hellenistic). Piérart 2004, 600.
[66] The foundation of the amphictyony is traditionally dated by the *terminus ante quem* of the 7th-century BC destruction of Nauplia (Kelly 1966, 119; Tausend 1992, 13; Jameson et al. 1994, 68). In contrast Hall 1995a, 584–5 suggested that the amphictyony may not have been founded until the Hellenistic period, and included the transfer from Nauplia and Prasiai to Argos and Sparta in a deliberately archaising foundation history.
[67] Str. 8.6.14. Wilamowitz-Moellendorff 1935, 102; Kelly 1976, 74; Tausend 1992, 12–6; Jameson et al. 1994, 66; Piérart 2004, 600.
[68] Tausend 1992, 16–9; Jameson et al. 1994, 67–8. Kelly 1966, 119–21 suggested that the amphictyony may originally have been founded as a coalition against Argos, but later abandoned this idea in view of Argos' comparable political weakness in the 7th century BC (Kelly 1976, 74).
[69] Smith 1986, 21–2; Hall 1997, 19–20. 32; Nielsen 1999, 18.
[70] Smith 1986, 31; Hall 1995, 9; 1997, 22–5. 32–3. Nielsen 1999, 18–9 points out that the definition of an ethnic group based on linguistic, religious and cultural features is a subjective construction, which can be manipulated by different groups and changes over time.

However, the ancient "Argolid" lacks such common markers of an overarching shared ethnicity. Unlike the inhabitants of neighbouring Arkadia,[71] the populations of the Argive plain and the Akte were not united by a common ethnonym or myth of origin. Instead they were perceived as multi-ethnic. Argos was considered as Dorian (with an additional Achaian and Pelasgian population), Asine and Halieis as Dryopean, Midea, Mycenae and Tiryns as Achaian, and Epidauros, Hermion and Troizen as Dorian and Ionian. Furthermore, ancient authors mention Karians in Epidauros and Hermion, Dryopes in Hermion and Troizen, and Achaians in Epidauros.[72] As a region without a shared mythical descent or a common ethnonym,[73] the "Argolid" thus lacked two of the most essential features of ethnic groups.[74]

Turning to other ethnic "markers", many aspects of language, religion and material remains do not characterise the "Argolid" as one entity with a distinctive shared culture, but emphasise a division between the Argive plain on the one hand and the Akte on the other — two areas that not only vary in dialect[75] and Archaic local script,[76] but also in their local cults.[77] In the Early Iron Age, funerary customs also differed between the western and eastern "Argolid", with a predominance of inhumation on the Argive plain, but not on the Akte.[78]

[71] Nielsen 1999, 22–36.
[72] Hall 1995b, 11; 1997, 67–77.
[73] Hall 1997, 77–99. 106–7.
[74] Smith 1986, 23; Renfrew 1987, 216; Hall 1997, 25.
[75] Hall 1995b, 13; 1997, 156–8. On the differences between the West Argolic and the East Argolic dialect, see for example Bartoněk 1972; Fernández Alvarez 1981.
[76] Jeffery and Johnston 1990, 114–82; Hall 1997, 149–52.
[77] For example, cults of Apollo, Poseidon and Demeter are common on the Akte from the 8th century BC onwards (for example at Epidauros, Kalaureia, Troizen and Halieis), but not on the Argive plain (Hall 1995b, 13; 1997, 101). Although at least two cultic associations are known from the region (the Kalaureian Amphictyony and the cultic association of Apollo Pythaieus), both include cities outside the "Argolid" (Tausend 1992, 10–9), and therefore cannot be considered as markers of a distinctive shared culture.
[78] Hall 1995b, 13.

The "Argolid" thus not only remains unattested as an ancient geographical or political concept, but also lacks the linguistic and cultural characteristics of an ethnic group. Instead, the political and cultural differences between the eastern and western part of the area suggest that the ancient "Argolid" consisted of not one, but two "regions": the territory of Argos in the west (consolidated through the city's territorial expansion), and the cultural (if not permanent political) unit of the Aktaian cities in the east. Naturally, the border between these two regions shifted over time. Whereas for the Early Iron Age Asine and Nauplia show similarities to the eastern Argolid, they were politically and culturally incorporated into the territory of Argos in the 8th and 7th century BC.[79]

Strictly speaking, the present study thus aims to investigate fortifications in the territory of Argos and on the Akte, rather than fortifications in the "Argolid". Nevertheless, the term "Argolid" will continue to be used for the sake of convenience, although (unless explicitly stated) not for the modern administrative unit "Argolida", but rather for a wider area comprising the territory of Argos as well as the Aktaian cities. This area largely overlaps with the "Argolida", but unlike the modern administrative unit also includes the southeastern part of the Akte, the territory of Kleonai and parts of the Thyreatis and Kynouria.[80]

By investigating two adjacent, but politically and culturally distinctive regions side by side, the present project differs from most previous regional fortification studies. In consequence, it has the potential to contribute to the scholarship on Greek fortifications even beyond adding yet another regional project. Despite their close proximity, Argos and the Akte not only differ culturally, but also in terms of landscape[81]

[79] Hall 1995b, 11; 1997, 75. 136–7.
[80] However, the region of study does not include the valley at the head of the Asopos river, which belonged to the independent Phleious (Meyer 1941, 272; Alcock 1991, 425–8; Piérart 2004, 613).
[81] On the landscape of the Argolid, see chapter 2.

and political organisation, allowing the present study to juxtapose the role of fortifications under different natural, political and socio-economic circumstances without distortions created by different terminologies, methodologies or primary research questions. Including two distinctive regions thus makes it possible to explore how differences in fortifications related to specific local factors.

1.4 Studying fortifications in the Argolid: an outline

Given that no systematic study of fortified structures has yet been attempted in the Argolid, what is the best approach to investigating the function of rural fortifications in this particular part of the Peloponnese? Since the earliest "travellers' reports", ancient literary texts have played a central role in the study of Classical and Hellenistic fortified sites. Herodotus, Thucydides and Xenophon provide the primary sources for Classical Greek warfare, while for the Late Classical and Hellenistic periods scholars rely heavily on Polybius, Diodorus, Strabo, Pausanias, Plutarch and the military treatises of Aeneas the Tactician and Philo of Byzantion.[82] These sources attest the existence of individual sites[83] or even provide more detailed — albeit often subjective[84] — information, but not all authors mentioned are equally well-informed or reliable.[85]

[82] Frederiksen et al. 2016a, 176. For a discussion of the 4th-century BC date of Aeneas the Tactician and the proposed identification of this author with the Arkadian general Aeneas of Stymphalus (Xen. *Hell*. 7.3.1), see for example Whitehead 1990, 8–13; Lane Fox 2017, 35–47. For the 3rd-century BC date of Philo of Byzantion and a discussion of his sources, see Drachmann 1948; Marsden 1971, 6–9; Fraser 1972, 428; Lawrence 1979, 71; Rihll 2013, 140–7; Whitehead 2016, 22. Fortifications are occasionally also mentioned in more unexpected literary genres. For example, one of the most compelling literary examples of a fortified farmstead can be found in Dem. 47. 53–57. 60–1.

[83] Frederiksen et al. 2016a, 173–4; Müth et al. 2016, 127–8.

[84] Frederiksen et al. 2016a, 174. On the difficulties of using ancient historiography as a source for ancient warfare, see Hornblower 2007; Whitby 2007, 54–71.

[85] Frederiksen et al. 2016a, 174. Contemporary sources and authors that were familiar with the local geography are usually considered preferable (Frederiksen et al. 2016a, 175). Although both Aeneas and Philo focus on siege warfare, it is very doubtful if Philo had the same practical experience as Aeneas (Whitehead 1990, 34; 2016, 24. 34), casting doubt on how far Philo's work should be used to reconstruct ancient military practices.

Besides literary texts, epigraphic sources — especially the so-called "building inscriptions"[86] — can contribute to the study of Classical and Hellenistic fortifications, but unfortunately only few surviving documents refer directly to fortified sites in the Argolid.[87] Inscriptions mentioning rural fortifications remain particularly rare, even beyond the region of study.[88] Both literary and epigraphic sources thus provide only limited evidence for the function of fortified sites in the Argolid.

Consequently, the present study is largely based on archaeological material and aims to shed new light on the Argolid's rural fortifications by placing them in the context of their surrounding landscape, using traditional approaches of on-site observation as well as GIS-based methods of data collection, visualisation and analysis. Interestingly, Geographical Information Systems (GIS) have not yet been used extensively to study Greek fortifications and their application has so far been limited to comparatively small areas such as the territory of Mantineia,[89] the Othrys mountains,[90] or the Paximadi Peninsula in southern Euboia.[91] A project on the borders of Attica, which pioneers the use of GIS-based methods of data collection and analysis for a more extensive area, is still ongoing.[92]

In the present study, the use of a GIS-programme (ArcGIS 10.4.1) will make it possible to integrate and overlay different categories of data that contribute to our

[86] The standard work of reference for these inscription is still Maier 1959; 1961, although further texts (such as a Hellenistic building inscription from Skotoussa in Thessaly ((Missailidou-Despotidou 1993)) have since been published.
[87] Two exceptions are an *epidosis* decree concerning the construction of a *diateichisma* at Troizina (80) (Frickenhaus and Müller 1911, 31; Welter 1941, 12; Maier 1959, 139–45; Winter 1971, 114; Lawrence 1979, 150; Sokolicek 2009, 132) and *SEG* xix 317 = *SEG* xxv 361 = *SEG* xxx 358 = *SEG* xli 278 (ca. 300 BC), which refers to the fortifications at Argos (12) (Maier 1959, 139–48. 284). For a more detailed discussion of these inscriptions, see chapter 4.
[88] One exception is an Attica inscription that refers to the "Tower of Kallias" at Besa (*SEG* xii 100 (367/6 BC)).
[89] Topouzi et al. 2002.
[90] Chykerda 2010; Chykerda et al. 2014a; 2014b.
[91] Seifried and Parkinson 2014.
[92] http://www.bordersofattica.org (5/7/2018).

understanding of fortifications in the Argolid. The first category is the region's physical landscape, represented by a digital elevation model (DEM) derived from the 1 arc-second SRTM digital elevation data.[93] Since the Argolid's landscape has undergone significant transformations since antiquity, chapter 2 will discuss the relevant landscape changes (for example erosion, alluviation and coastline developments), as well as summarising the available evidence for vegetation and land use between the 4th and 1st century BC.

The second category of data is the fortifications and possible fortifications themselves — all in all, 146 structures, which are collected in a descriptive catalogue (volume II). For each fortification, this catalogue includes the site's main name and alternative toponyms, its location in coordinates (if known), the site's type and approximate size, the date of visit, a short bibliography, and a brief description of the structural remains and finds, as well as any dating that has previously been suggested.[94] Chapters 3 and 4 provide a brief preliminary discussion of this material. Chapter 3 focuses on the fortifications' typology, while chapter 4 aims to establish the first systematic framework for dating fortifications in the Argolid.

The third category is the interpretive data used to analyse the fortified sites in chapters 5–7. Chapter 5 provides the necessary background on the Argolid's Late Classical and Hellenistic political geography and on the region's settlement patterns (as far as this lies within the scope of the present study), chapter 6 discusses the role of rural fortifications as territorial defences, and chapter 7 considers the structures' possible significance beyond a strictly military-strategic function, especially as places of refuge, habitation, production and agricultural processing. The interpretive data analysed in these

[93] http://www.eea.europa.eu/data-and-maps/data/eu-dem (7/11/2015). The precise resolution depends on the latitude, but with an accuracy of ca. 30 m this is currently the most detailed DEM that is freely available.

[94] This information was gathered from previous publications and during on-site visits. Unless otherwise stated, all coordinates were taken on-site with a handheld GPS device. Sites that could not be located are listed in the catalogue, but could not usually be included in the analyses.

chapters includes a reconstruction of ancient political boundaries, classified viewshed analyses, least-cost paths, "walking distances", and cost boundaries.[95] In addition to this GIS-based data, the study will also discuss information from ancient literary and epigraphic sources and small finds.

By combining these different sources and methods, the current project not only provides the first systematic study of rural fortifications in the Argolid, but also casts new light on wider issues, such as the interaction between natural environment and human activity, or the impact of different forms of conflict on everyday life in ancient communities. It thus not only contributes to our understanding of the specific region, but also serves as a case study to test the potential of GIS-based methods of data collection and analysis in the wider field of Greek landscape archaeology.

[95] The exact methods used to calculate these data will be discussed in the relevant chapters.

CHAPTER 2: THE LANDSCAPE OF THE ANCIENT ARGOLID

2.1 Setting the scene

"During the Trojan War the Argeia was able to support only few inhabitants, because it was marshy, but Mycenae was prospering and therefore more famous. But now the opposite is the case […]: for the one has become unproductive and completely dry, while the other, which had once been unproductive because of its stagnant pools, has become serviceable."[96] Regardless of whether such drastic developments really did occur, this passage from Aristotle's *Meteorologia* is a reminder that the landscape of the Argolid may have changed significantly over the last 2500 years. But apart from the quoted passage, landscape changes do not feature prominently in the works of ancient authors, who usually show frustratingly little interest in the natural environment around them.[97]

Given this lack of ancient textual sources, modern geological, climatological, archaebotanical, archaeozoological and palynological studies provide the best glimpses of the landscape that originally surrounded the Late Classical and Hellenistic fortifications in the Argolid. The present chapter aims to gather this existing research, beginning with possible changes to the solid geology before moving on to sediment deposition and coastline changes, groundwater levels, climate change, the ancient vegetation and questions of pre-Roman land use.

Such an attempt at "reconstructing the ancient landscape" presents many problems familiar to any archaeologists of the Greek world. For example, comparatively little scientific research has so far focused on the periods under investigation, and most geological or climate studies aim to investigate developments within a far larger temporal

[96] Arist. *Met*. 352a.11–18.
[97] Pretzler 2007, 62; Hughes 2014, 6.

framework, making it difficult to correlate observed changes with specific periods. Nevertheless, bringing together previous studies will highlight some of the most important landscape changes in the region and help to evaluate the differences between the original and the modern landscape setting of the Argolid's Late Classical and Hellenistic fortifications.

2.2 Landscape changes: from tectonics to vegetation

Geologically, the northeastern Peloponnese is a very dynamic area and throughout its human history experienced significant seismic and volcanic activity.[98] The reason for these phenomena is the region's location on the "Aegean microplate" between the converging Eurasian and Greek plates in the north, the Anatolian and South Marmara plates in the east, and the African plate in the south.[99] The "Aegean microplate" itself currently moves southwards at a rate of ca. 10–30 mm per year (causing deformation along its edges)[100] and is traversed by numerous minor active faults.[101]

Both major and minor tectonic faults play an important role in shaping the landscape of the northeastern Peloponnese, especially through volcanic activity and developments caused by seismic events.[102] The region's most notable volcanic feature is

[98] For seismic events in ancient, Byzantine and early modern sources, see Ambraseys and Jackson 1990, 672; Ambraseys 1996, 29; 2009. For recent seismic events, see Nyst and Thatcher 2004, figure 1.
[99] For a summary of different deformation patterns proposed for the eastern Mediterranean, see Nyst and Thatcher 2004, 33–41.
[100] Nyst and Thatcher 2004, 12. For tectonic deformations along the Gulf of Corinth, see Goldsworthy et al. 2002, 597; Reilinger et al. 2010, 27.
[101] Papanikolaou et al. 1988, 170–2; 1994; Makris et al. 2004, 921; Pe-Piper and Piper 2013, 147–8; Kolaiti and Mourtzas 2016, 73–4. The deformation and subsidence along these faults is comparatively small, for example ca. 10–50 cm/ka^{-1} along a fault south of Argos (van Andel et al. 1993, 530).
[102] A third development caused by tectonic activity is coastal uplift, but at the Corinthian Gulf the uplift amounts to just 10 cm over the last 3000 years (McNeill and Collier 2004, 86; Shaw et al. 2010, 401–3).

the island of Methana,[103] which experienced its most recent volcanic activity in the 3rd century BC.[104] Other volcanic deposits in the region predate the Classical period.[105]

Seismic activity is more widespread, and is occasionally even mentioned by ancient authors. For example, the Spartans abandoned an expedition against Argos after an earthquake in the summer of 414 BC,[106] while in 373 BC the cities of Helike and Bura on the Corinthian Gulf were destroyed in a seismic event.[107] Earthquakes in the Argolid usually do not exceed M=7 in magnitude,[108] but recent studies have shown that even earthquakes of only ca. M=4.3 can have a considerable impact on landscape formation, for example by triggering increased soil erosion.[109] Although individual seismic events are difficult to trace archaeologically, they may thus indirectly have contributed to significant environmental changes over the last 2,500 years.

This brings us to two further important processes that shaped the landscape around the Argolid's ancient fortifications: erosion and the deposition of sediments. Sedimentary deposits are formed through the physical or chemical weathering of a source rock, are transported by water, strong winds, gravity flows or biological processes, and are subject to postdepositional changes such as renewed weathering or bioturbation (disturbance by animals and plants).[110] These processes are not only of interest because

[103] Mee et al. 1997, 7; Pe-Piper and Piper 2013, 147.
[104] For this eruption, see Stothers and Rampino 1983, 6366; Fytikas et al. 1986; Jameson et al. 1994, 17; Higgins and Higgins 1996, 39; Mee et al. 1997, 5; Ambraseys 2009, 90–1; Pe-Piper and Piper 2013, 151. It is mentioned by Str. 1.3.18; Paus. 2.34.1 and Ov. *Met*. 15.296–306. According to Paus. 2.34.1 it took place during the reign of Antigonos, either Antigonos Gonatas (Higgins and Higgins 1996, 39) or Antigonos Doson (Ambraseys 2009, 90).
[105] Pe-Piper and Piper 2013, 150.
[106] Thuc. 6.95.1.
[107] Paus. 7.24.12; D. S. 15.48.2–3; Str. 7.385. Bousquet et al. 1983, 9; Horden and Purcell 2000, 305.
[108] The reason is probably the limited length of the individual fault segments (Ambraseys 1996, 29–30).
[109] Malamud et al. 2004, 57.
[110] Rapp 1998, 18–21. 81–5.

sedimentary deposits provide much of the Argolid's arable soil,[111] but also because the distribution of sediments affects the survival and visibility of archaeological sites.[112]

To understand the processes that shaped the Holocene sediments in the Mediterranean, archaeologists have long relied on C. Vita-Finzi's model of two phases of sediment formation during the last glacial period (the "Older Fill") and the Late Roman or early modern period (the "Younger Fill").[113] However, more recent data collections contradict the notion of a two-stage, uniform and monocausal sediment deposition, and instead emphasise the importance of regional processes.[114]

Turning to the Argolid, the most extensive known Holocene sediment deposits are located in the area of the Argive plain. Investigations into the plain's sedimentary history were undertaken between 1984 and 1987[115] and in the 1990s.[116] Thanks to these studies, post-Roman sediment deposits in the area can be divided into three zones (**figure 2**): a first zone of coarse deposits on the northern plain (ca. 1–2 m deep), a second zone of fine deposits in the southeast (ca. 0.5–1 m deep) and a third zone (ca. 4–8 m deep), that was laid down by the irregular floods of the Inachos and Xerias rivers and obscures many of the plain's ancient remains.[117]

Beyond the Argive plain, the region's sedimentary history has received the fullest attention in the southern Akte, where processes of sediment formation were investigated

[111] Jameson et al. 1994, 173.
[112] Cherry 1983, 397; Simpson 1983, 45, 1984, 116; Terrenato 2000, 60; Given 2004, 18–9.
[113] Vita-Finzi 1969. For the application of this model in Greek archaeology, see for example Bintliff 1975, 1976, 1977.
[114] For example Butzer 1969; Raphael 1973, 86–9; Kraft et al. 1977; Davidson 1980; Wagstaff 1981; Pope and Andel 1984; Bintliff 1992, 10–11; Jameson et al. 1994, 184; Higgins and Higgins 1996, 24–5; Bintliff 2002; Fuchs 2007, 349.
[115] Finke 1988; van Andel et al. 1990; Zangger 1993. This study is based on detailed topographical maps (1:5000), stratigraphic observations in river beds or construction trenches, and 81 core samples (Zangger 1993, 11–4).
[116] Fouache and Gaki-Papanastassiou 1997; Fouache 1999, 169–92. In this study, the stratigraphic context of archaeological sites was used to understand the sedimentary history of the plain.
[117] Fouache and Gaki-Papanastassiou 1997; Fouache 1999, 169–92.

as part of the *Southern Argolid Survey*.[118] The study led to the identification of seven different phases of sediment deposition, each overlaid by a loam and soil profile that indicates a period of stability between phases of erosion.[119] Three of these phases were laid down during the Pleistocene and thus considerably predate the period of this study,[120] while four phases belong to the Holocene (the "Pikrodhafni" (2500–1000 BC), the "Lower Flamboura" (350–50 BC), the "Upper Flamboura" (AD 400–1700) and the "Kranidhi" (since AD 1700)).[121]

Based on this stratigraphy and the volume of deposited sediment, the scholars working on the *Southern Argolid Survey* not only argued for human agency as a possible cause of erosion,[122] but also estimated that ca. 0.5–0.6 m of upland soil were lost during the last 5000 years. If the region is divided into a northern and a southern zone, the estimated soil loss amounts to ca. 0.4 m in the north and 1 m in the south,[123] suggesting that in the Classical period the southern Akte was somewhat, but not considerably, richer in soil than it is today.[124]

Attempting a similar estimate for the uplands around the Argive plain, the results — though very tentative — are roughly comparable. According to E. Fouache and K.

[118] This study included the analysis of aerial photographs, a terrain survey, and a study of soil profiles (Pope and Andel 1984, 282; van Andel 1986, 107; van Andel et al. 1990, 381; Jameson et al. 1994, 173–4). The chronology of the different phases of deposition was established through archaeological sites and artefacts, radiocarbon dates and historical information, as well as uranium/thorium disequilibria for periods prior to the Bronze Age (Pope and Andel 1984, 283–4; Pope et al. 1984; van Andel 1986, 107; Jameson et al. 1994, 175).
[119] Pope and Andel 1984, 282; van Andel 1986, 108; van Andel et al. 1990, 381; Jameson et al. 1994, 174–5. 182.
[120] The "Lower Loutro" (280000–244000 BP), the "Middle Loutro" (ca. 60000 BP) and the "Upper Loutro" (42000–35000 BP). For the current dating of these deposits, see Jameson et al. 1994, 188. For a previous chronology, see Pope and Andel 1984, 293.
[121] Pope and Andel 1984, 292–3; van Andel 1986, 109; van Andel et al. 1990, 382–3; Jameson et al. 1994, 188.
[122] Pope and Andel 1984, 299–302; van Andel 1986, 108–126; van Andel et al. 1990, 382–3; Jameson et al. 1994, 191–2.
[123] van Andel 1986, 110–11; Jameson et al. 1994, 192–4.
[124] Jameson et al. 1994, 194.

Gaki-Papanastassiou's study of post-Roman alluvia,[125] an estimated 195,815,000–342,450,000 m^3 of sediment have been deposited on the Argive plain since the Roman period (**table 1** and **figure 2**).[126] This material must originate in the drainage basins around the plain, which cover a total area of approximately 730 km^2 (**figure 2**).[127] Assuming (for the sake of argument) that erosion took place at a similar pace in all drainage basins, at least 0.27–0.49 m of sediment will have been lost in the upland areas since the Roman period.

So far, this overview of previous landscape studies has mainly focused on inland areas, but the redistribution of sediment is also important for the formation and development of coastlines. Like any coast, the present shoreline of the Argolic and the Saronic Gulfs is the result of numerous processes, including coastal erosion, seaward progression though sediment deposition, global eustatic sea level changes (caused by variations in the amount of water stored as ice-sheets), and tectonic activity.[128] Even within a comparatively small area, coastal developments can vary significantly,[129] especially if there are differences in the local geology.

In the Argolid, historic coastline changes have so far been studied in five areas, which experienced very diverse processes of shoreline formation over the last 2500 years. Moving along the Argolic Gulf from west to the east, the southwesternmost study area is the coastal plain of Astros, a plain that was formed through sediment deposition and had already reached its present extent by ca. 3000 BC.[130] No indications of sea-level changes

[125] Fouache and Gaki-Papanastassiou 1997, 314–5; Fouache 1999, 170–1.
[126] This figure is only a very rough estimate, as the calculated volume of sediment does not include alluvia deposited in former marshes or below sea level.
[127] The plain is here defined as the area below 60 mamsl.
[128] van Andel 1989, 734; Higgins and Higgins 1996, 12; Grove and Rackham 2001, 328–9; Pirazzoli 2005; Stewart and Morhange 2009, 390–93. 402–5; Walsh 2014, 31–6.
[129] van Andel 1989, 735; Stewart and Morhange 2009, 386–8; Walsh 2014, 34.
[130] Goester 1993, 43.

were recorded at Astros,[131] but further south submerged cuttings and steps at the harbour of ancient Zarax suggest a sea-level rise of at least 3 m since antiquity.[132]

Moving further east, the development of the northern Argolic shoreline is strongly linked to the sedimentary history of the Argive plain.[133] According to the above-mentioned studies, the plain had largely reached its modern extent by ca. 1100 BC,[134] with the exceptions of the shoreline south of Tiryntha (which at least until the Roman period ran several hundred metres inland and was characterised by coastal marshes)[135] and a marshy freshwater lagoon at the mouth of the Erasinos river. This lagoon, known as Halkyonian Lake or Lake Lerna (**figure 2**),[136] probably largely silted up during the Late Bronze Age, but expanded again during the Late Hellenistic or Roman period.[137] This means that both at Tiryntha and at the mouth of the Erasinos access to the sea was probably more difficult in antiquity than it is today.[138]

To the east of the Argive plain, the shoreline at Asini largely resembled the modern coast from the Late Helladic period onwards, except in an area north of the Kastraki hill, where a small inlet — now silted up — may have provided the Hellenistic settlement with a sheltered harbour (**figure 3**).[139] Judging by the sedimentary deposits

[131] See above.
[132] Flemming et al. 1973, 8.
[133] The results of this study were published in Zangger 1993, in the unpublished thesis Finke 1988, and in several articles (e.g. Finke and Malz 1988; Niemi and Finke 1988; Zangger 1991; 1994). The development of Lake Lerna was also summarized by Knauss 1996, 125–62.
[134] Zangger 1993, 64.
[135] Zangger 1991, 13, 1993, 64–5.
[136] Str. 8.6.2; Paus. 2.37.5–6.
[137] Finke and Malz 1988; Niemi and Finke 1988, 133–135; Zangger 1991, 1993, 62–65.
[138] Zangger 1993, 65–7 also suggested a sea level rise of ca. 0.5–1.2 m since the Early Bronze Age, but this figure is at odds with the now destroyed remains of a mole at Nafplio, which lie ca. 3 m below the present surface (Negris 1904, 352–3).
[139] Zangger 1994a, 232–3. This study is based on detailed topographical maps (1:5000) and 18 core samples (Zangger 1994a, 221. 226–7).

and by a now submerged wall west of the acropolis, the sea level was probably ca. 2 m lower in the Classical and Hellenistic period than it is today.[140]

Moving to the Akte, the coastline formation in many areas is characterised by transgression rather than progradation (**figure 4**).[141] The main reason is a substantial sea-level rise: according to radiocarbon-dated samples from Porto Cheli, the sea level between ca. 1500 BC and the late 3rd century AD was at least 5.3 m lower than it is today,[142] a figure that finds support in the submerged archaeological sites at Porto Cheli, Phourkaria, Lakkes, the Korakia Island, and the bays of Kranidi and Potokia.[143] As a result, coastal fortifications such as Phranchthi (62) and Vigla (84) were originally located further inland.

Changes in sea-level have also been recorded on the southern coast of the Saronic Gulf. With the help of submerged archaeological sites, beachrock phases and wave notches,[144] E. Kolaiti and N. D. Mourtzas recently established a local sea-level curve with a period of sea-level stability at ca. -3.3 m (from ca. 1800 BC to the late 4th or 6th century AD) and three steps in sea-level rise to ca. -0.9 m (4th–6th century AD), ca. - 0.55 m (AD 1555–1838) and to the present level.[145] This sea-level rise has important

[140] Zangger 1994a, 236–7. Both the date and the function of this wall are unclear. While Frödin 1938, 56 reported bricks and therefore suggested a Venetian date, Zangger 1994a, 233 dated the wall to the Hellenistic period. It has been variously interpreted as a coincidental accumulation of rocks (Bintliff 1977, 315), a landing quay (Frost 1963, 101), a harbour basin (Frödin 1938, 56 rejected by Flemming et al. 1973, 7; Zangger 1994a, 233), or an underwater fortification to prevent ships from approaching the Kastraki hill (Zangger 1994a, 233).
[141] For the methodology of this study, see van Andel et al. 1980, 390–2; van Andel and Lianos 1983; Jameson et al. 1994, 196–200.
[142] Jameson et al. 1994, 199–210. An exception is the bay of Koilada, where the eastern shoreline has shifted seawards through alluvial deposits (Jameson et al. 1994, 208).
[143] Flemming et al. 1973, 7; Flemming 1978, 411; Jameson et al. 1994, 200; McAllister 2005, 85–97.
[144] Kolaiti and Mourtzas 2016, 74–5. Previous studies on sea-level changes in the Saronic Gulf were conducted at Kenchreai (Flemming et al. 1973, 4; Scranton et al. 1978, 144–7), the bay of Korphos (Nixon et al. 2009), Kalamianos (Dao 2011) and Aigina (Knoblauch 1969; 1972). Further submerged archaeological sites were recorded at Palaia Epidavros (Κριτζάς 1972a; Flemming et al. 1973, 5; Flemming 1978, 411) and Methana (Flemming et al. 1973, 5). On the problems of using wave-notches to reconstruct past sea levels, see Pirazzoli and Evelpidou 2013.
[145] Kolaiti and Mourtzas 2016, 45–89.

implications for reconstructing the ancient shoreline, for example at Palaia Epidavros, where the harbour was even more enclosed and defensible in antiquity than it appears today.[146]

Without further fieldwork, it is impossible to say for certain how sea-level changes and the movement of sediment affected the coastline outside the four areas discussed, but the studies indicate that shallow coastlines with comparatively large drainage basins were most susceptible to change.[147] This would include the plains of Iria, Kantia, Asini, Argos and Astros, as well as the bays of Palaia Epidavros, Poulithra, Phokianou, Kyparissi and Vathy Avlaki (**figure 5**).

Returning to the Argolid's inland areas, one of the most important factors that influenced the region's agricultural potential and settlement patterns was the availability of water.[148] The region has three main groundwater sources, which can be tapped by wells or emerge on the surface as springs: the contact zone between limestone and impermeable flysch or ophiolite,[149] alluvial fills,[150] and karst springs,[151] most notably the source of the Erasinos at Kephalari.[152]

Figure 6 shows a summary of some modern springs and wells fed by these sources. This map can help to identify sources of water in the vicinity of ancient

[146] On the harbour of Palaia Epidavros, see Kolaiti and Mourtzas 2016, 77–8.
[147] van Andel et al. 1990, 380–1; Jameson et al. 1994, 195.
[148] For example, Crouch 1993, 105 identified water sources as one of the determining factors for urban locations in ancient Greece.
[149] For example in the valley of Phournoi and on the Iliokastro plateau (Jameson et al. 1994, 171) or on the east slope of Argos' Larissa (Crouch 2004, 115).
[150] For example in the Ermioni valley (Jameson et al. 1994, 171) or on the plain of Argos (Crouch 2004, 115).
[151] Karst springs develop when rainwater is collected in large, flat basins (poljes) and drains through sinkholes or dolines into underground drainage systems, before re-emerging at the surface elsewhere (Crouch 1993, 67–78; Higgins and Higgins 1996, 13–15; Walsh 2014, 79).
[152] Ancient authors connected the source of the Erasinos at Kephalari with sinkholes at Stymphalos (Hdt. 6.76; D. S. 15.49.5; Str. 6.2.9. 8.6.8; Paus. 2.24.6. Pritchett 1965, 122–3. 132; Burdon 1967; Stringfield and Rapp 1977; Crouch 1993, 66, 2004, 113), but it belongs to a subterranean drainage system combining water from Stymphalos, Alea and Skotini (Morfis and Zojer 1986; Higgins and Higgins 1996, 49; Crouch 2004, 113–5).

fortifications, but abandoned wells demonstrate that in many parts of the region the groundwater level has dropped significantly since antiquity,[153] while the sea-level rise charted above has limited the availability of freshwater in coastal areas.[154] Without more detailed research, the groundwater supply of individual ancient sites in the Argolid is therefore difficult to establish.

Similarly, the exact course of streams and rivers in the region is difficult to reconstruct.[155] The southern Argolid is characterised by numerous but comparatively small drainage basins, while the northern and western Argolid is dominated by the large basins of the Inachos, Xerias (the ancient Charadros),[156] Erasinos, Xavrio and Tanos (**figures 1 and 5**). With the exception of the Erasinos, most streams and rivers in the region are seasonal or only carry water periodically,[157] but whether this was also the case in the Classical and Hellenistic periods strongly depends on the ancient climate.

Today, the Peloponnese has a typical Mediterranean climate, with hot, dry summers and mild, wet winters.[158] These conditions are not only the result of global and hemispherical trends, but also of regional and local circulation patterns,[159] which climatically divide the Mediterranean into environmentally very diverse "microregions". These local patterns make it difficult to extrapolate the ancient climate of the Argolid

[153] Harper 1976, 49; Jameson et al. 1994, 169–71.
[154] For example by submerging coastal springs (Harper 1976, 49; Jameson et al. 1994, 171) or contaminating springs with sea water (Jameson et al. 1994, 171).
[155] Especially on coastal plains, the course of rivers has changed considerably since antiquity. For example, a 5th-century BC bridge over the Xerias already ceased to function in the 4th or 3rd century BC (Fouache and Gaki-Papanastassiou 1997, 318; Fouache 1999, 177). On the course of the Xerias, see also Πιτερός 1998a, 180–5.
[156] Baladié 1980, 70–73; Fouache 1999, 173.
[157] Zangger 1993, 18; Jameson et al. 1994, 169; Higgins and Higgins 1996, 45; Fouache and Gaki-Papanastassiou 1997, 316; Fouache 1999, 173–77.
[158] Jameson et al. 1994, 17; Harding et al. 2009, 69; Weiberg et al. 2016, 42.
[159] Harding et al. 2009, 73–77; Unkel et al. 2011, 89; Lionello 2012; Weiberg et al. 2016, 42.

from palaeoclimatic research conducted elsewhere,[160] and shift the focus towards climate studies conducted in the region itself or in adjacent areas.

Until recently, pollen records provided the main source for local climate studies,[161] but on the Peloponnese their preservation is usually patchy.[162] This has led scholars to investigate new climate proxies, for example the varying ratios of rubidium and strontium in lake sediments at Asea (Arkadia) and Stymphalos (Korinthia),[163] or the chronological distribution of different oxygen isotops in stalagmites from the caves of Kapsia (Arkadia) and Alepotrypa (Lakonia).[164]

Both new proxies suggest a significant degree of climate variability over the last 2500 years (**figure 7**). At Asea, the ratios of rubidium and strontium indicate a stable climate between the Late Helladic period and ca. 750 BC, followed by an increasingly dry and warm period, which reached its peak around 350 BC.[165] At first glance, these results seem to lend credence to the scenario described by Aristotle in the passage quoted at the beginning of this chapter, but the picture is more complex. In contrast to the Rb/Sr ratios from Asea, the oxygen isotopes from Alepotrypa indicate an arid period between 1750 BC and 600 BC, followed by wet conditions that prevailed until AD 300 (though interspersed with dry spells around 350 BC and AD 50–150),[166] while the Kapsia Cave

[160] For example, there are marked differences between the continental European climate reconstructed from tree-ring data (Büntgen et al. 2011) and the written records from the Mediterranean (Wilson 2013, 261).
[161] Atherden and Hall 1994; Jahns 2005; Urban and Fuchs 2005.
[162] In addition, changes in vegetation could also be influenced by other factors. For both problems, see Bottema 1990, 126; Fuchs 2007, 352.
[163] Unkel et al. 2011; Heymann et al. 2013; Unkel et al. 2014. Individual sediment layers were dated through radiocarbon analyses (Heymann et al. 2013, 45–6; Unkel et al. 2014, 92–4). Unfortunately the late Holocene sequence at Stymphalos has not yet been published (Unkel et al. 2014, 90).
[164] Finné et al. 2011; 2014; Finné 2014; Boyd 2015. The chronology is probably more precise at Alepotrypa (Weiberg et al. 2016, 44).
[165] Unkel et al. 2014, 101–2. Due to pedogenic processes, the last 2000 years in the record at Asea are difficult to interpret (Unkel et al. 2014, 102).
[166] Weiberg et al. 2016, 58.

records three "dry to wet" climate cycles around 950–400 BC, 400 BC–AD 150 and AD 150–650.[167] The recent climate studies have thus produced conflicting results for the region and until further research is published, it is uncertain whether and how they can be reconciled. For the time being, it therefore remains uncertain whether Aristotle's remark reflects an episode in the Argolid's actual climate history.

This brings us to a final aspect of the natural environment around the Late Classical and Hellenistic fortifications in the Argolid: the ancient vegetation. In general, the ancient Argolid was characterised by similar species to today, especially conifers, deciduous trees, evergreen maquis species, *ericaceae*, grasses, sedges, cereals, olive and vine.[168] Looking at the individual pollen records in more detail reveals changes in vegetation across antiquity, as well as local variation. Starting with tree and maquis species, semi-natural woodland had largely disappeared around Kleonai by the Roman period,[169] while Koilada in the southern Akte experienced a strong increase in forest vegetation (*abies*, *pinus* and *platanus*) from the end of the Geometric period onwards.[170] Both at Lerna on the Argolic Gulf and at Thermisi in the eastern Akte, woodland and maquis pollen increased at the end of the Hellenistic period, perhaps indicating an abandonment of previously cultivated farmland.[171]

A second development visible in the pollen record at Lerna is an increase in swamp vegetation from ca. 300 BC onwards.[172] Chronologically, this corresponds with the expansion of Lake Lerna, as well as with a humid phase in the climate reconstructions

[167] The cycles are interrupted by brief spells of wetter conditions around 850 BC, 700 BC, 400–100 BC, AD 160–300 and AD 770. For the results from Kapsia, see Finné 2014, 42; Finné et al. 2014, 224–5; Weiberg et al. 2016, 58.
[168] Sheehan 1979a, 324; Atherden and Hall 1994, 125; Jameson et al. 1994, 17. 161. For the species recorded at the individual sites, see Sheehan 1979b; 1979a, 321; Bottema 1990, figure 47; Atherden et al. 1993, 354 figure 2; Jahns 1993, 195.
[169] Atherden et al. 1993, 353–5; Atherden and Hall 1994, 125.
[170] Bottema 1990, 124–7.
[171] Jahns 1993, 197–200; Jameson et al. 1994, 168–9; Weiberg et al. 2016, 49.
[172] Jahns 1993, 198–8.

from Alepotrypa and Kapsia,[173] perhaps suggesting that the climate in the Argolid did indeed become wetter during this period.

Besides recording variations in forest, maquis and swamp vegetations, the pollen records also chart the intensity of olive cultivation in different areas and periods. For example, the pollen record from Thermisi shows a notable rise in olive cultivation from 850 BC onwards, which reaches its peak in the Classical and Hellenistic period, before declining in Early Roman times.[174] Conversely, olive pollen continues to be common at Lerna into the Early Roman period.[175] This not only reminds us of the varying impact of human activity on specific natural environments, but also leads us to the next part of this chapter, which discusses agriculture and other forms of land use in the ancient Argolid.

2.3 Land use: agriculture, pastoralism and "marginal" resources

The remaining part of this chapter sets out to investigate the evidence for agriculture, pastoralism, and the exploitation of marginal or maritime resources in the ancient Argolid, combining the aforementioned pollen records with literary, epigraphic, archaeological, archaeobotanical, archaeozoological and osteoarchaeological material.[176] Many discussions of ancient agriculture are dominated by the so-called "Mediterranean Triad" of olives, cereals and vine,[177] but the role of other crops should not be underestimated. For example, legumes could contribute to the human diet as well

[173] Zangger 1993, 64–5. He also pointed out that this phase corresponds to a peak in porotic hyperstosis in human bones from southern Greece, a condition that was previously used as a proxy for malaria (Angel 1966, 761–2; 1972, 100), but is probably related to nutritional megaloblastic anaemia (Keenleyside and Panayotova 2006, 377–81; Walker et al. 2009, 109. 114).
[174] Jameson et al. 1994, 168–9.
[175] Jahns 1993, 197.
[176] Since the Argolid does not possess major geological resources (Jameson et al. 1994, 301), mines and quarries are not included in this overview.
[177] Sarpaki 1992, 61; Garnsey 1999, 13–14.

as provide fodder for livestock and restore nitrogen to "tired soils",[178] while tree crops such as pears, pomegranates, figs and apples already feature in the *Odyssey*.[179] Figs in particular are attested as an emergency food and as a low-status staple.[180]

When attempting to reconstruct the agricultural landscape of the Late Classical and Hellenistic Argolid, we are faced with the problem that some crops are archaeologically "invisible".[181] For example, vines are usually underrepresented in pollen records,[182] while remains of crops that require only little processing are less likely to survive than those that are parched before consumption.[183] Plants whose cultivation required specialised tools also "generate" more archaeological material than those cultivated or processed with multi-purpose equipment.[184]

Overall, olives are by far the most frequently attested crop in the Argolid (**table 2 a**), mainly through olive mills,[185] archaeobotanical remains,[186] and pollen records.[187]

[178] Isager 1992, 42–3; Sarpaki 1992, 71; Jameson et al. 1994, 266; Flint-Hamilton 1999; Garnsey 1999, 15.
[179] Hom. *Od*. 7.115–26.
[180] Polyb. 16.24.9. Foxhall 1993a, 141; Jameson et al. 1994, 276; Foxhall 2007, 80. Different tree crops were often cultivated on the same plot of land (Osborne 1987, 42–3; Foxhall 1996a, 54; 2007, 113–4), whereas polycropping of arable and tree crops was rare before the Roman period (Foxhall 2007, 113–4).
[181] In literary sources, the cultivation of specific crops is only rarely attested. A rare exception could be Theoph. *HP* 7.4.2; Ath. 2.56f; Plin. *HN*. 19.25.75–7, which mention a specific variety of "Kleonian" radishes.
[182] Atherden et al. 1993, 355.
[183] Sarpaki 1992, 72.
[184] An important issue that still remains unresolved is the use of agricultural terraces. Hanson 1995, 79–84 suggested that terraces were widespread in antiquity, but on closer inspection, the evidence for Classical and Hellenistic agricultural terraces is very limited. In written sources, the word αἰμασιά may refer to terrace walls (Robert 1945, 79–81, 1946, 137–8; Rackham and Moody 1992, 128, 1996, 143; Grove and Rackham 2001, 113), but all 36 attestations of this term collected by Price and Nixon 2005 are ambiguous (Foxhall 2007, 66–8). Archaeologically, terraces are difficult to date (on different possible methods and their problems, see Foxhall 1996a, 60–4; Frederick and Krahtopoulou 2000, 90–1; Grove and Rackham 2001, 112–3; Price and Nixon 2005, 679), and even the datable material found at excavated terraces on Delos has no clear stratigraphic relationship to the walls (Foxhall 2007, 43).
[185] On the different types of pre-Roman olive crushing equipment, see Brun 2004, 8–9.
[186] At Lerna (Hopf 1961, 243; 1962, 4) and at Prosymna: Pyrgouthi (69) (Penttinen 2005, 318–9; Sarpaki 2005, 330–9).
[187] At Kleonai (Atherden et al. 1993, 353–5; Atherden and Hall 1994, 124–5), Koilada (Bottema 1990, 126–7), Lerna (Jahns 1993, 197–8) and Thermisi (Jameson et al. 1994, 167–9).

Sites of known olive production, processing or consumption are particularly common in the southern Akte, the northwestern Argolid and the valley of Prosymna (**figure 8**), but this distribution pattern may largely be a result of the current state of research. Moveable equipment in perishable materials may also have been widespread,[188] so that a lack of surviving agricultural equipment does not necessarily argue for an absence of olive cultivation.

Both pre-Roman and undated sites of olive processing or consumption generally share three characteristics. Firstly, they do not usually lie above 500 mamsl, which even today is the maximum altitude of olive cultivation in the region.[189] Secondly, presses and olive crushing equipment are mainly found on slopes that are less steep than 10°, i.e. in areas that were cultivable without terracing.[190] North-facing slopes are generally avoided, echoing the advice given in Theophrastus' *Historia Plantarum*.[191] Thirdly, the preferred substrates appear to be alluvial deposits, flysch, marl or serpentine, while limestone was usually avoided.[192] Fortifications in areas that share these characteristics are thus more likely to be associated with olive cultivation than those at higher altitude, on steeper slopes or on limestone.

Like olives, cereals played an important role in the ancient diet,[193] but in the Argolid their cultivation and consumption is only attested through archaeobotanical

[188] Foxhall 1993b, 192–9; Mee et al. 1997, 261; Foxhall 2007, 136.
[189] Foxhall 2007, 112. Only at Elliniko Astrous (21) have several press weight blocks been recorded above 500 mamsl (Goester 1993, 75–6).
[190] Whitelaw 1998, 234 estimated that in antiquity slopes up to 10° could be cultivated without terracing. Exceptions are the press weights at ancient Elliniko Astrous (21) and the olive mill at Vourlia 1 (86).
[191] Thphr. *CP* 2.3.1–3. 3.7.9. Foxhall 2007, 112.
[192] The only exceptions are again Elliniko Astrous (21) and Vourlia 1 (86).
[193] Foxhall and Forbes 1982, 41; Garnsey 1999, 17–19. The main cereals consumed in antiquity were wheat and barley, but millet, emmer wheat, einkorn wheat and oats were also cultivated (Garnsey 1988, 51–2, 1999, 119–21; Sallares 1991, 361–8; Isager 1992, 21; Jameson et al. 1994, 265).

remains at the tower of Prosymna: Pyrgouthi (69),[194] through a possible threshing floor at Ermioni: Magoula (93),[195] and through the pollen record at Roman-period Kleonai[196] (**figure 8** and **table 2 b**). This hardly allows conclusions about ancient agricultural practices, but unless terraces were widespread in antiquity, the cultivation of arable crops was probably limited to slopes below 10°.[197] Grapes, the third part of the "Mediterranean Triad", are so far only attested at Prosymna: Pyrgouthi (69),[198] where they were found together with legumes, almonds and figs (**figure 8** and **table 2 c–e**).[199] The social and economic implications of these finds will be explored in more detail in chapter 7, but sites like Prosymna: Pyrgouthi (69) point towards a mixed cultivation of different crops rather than large scale monocultures.

Moving on from ancient agriculture, pastoralism[200] allows the exploitation of otherwise unused land[201] and agricultural residues (e.g. stubble, straw, chaff, leaves, spoilt fruit and press cakes).[202] Based on historical and ethnographic studies,[203] two models have been proposed for ancient pastoralism (a mixed farming and herding regime on the one hand and a regime of seasonal transhumance, which operated independently of agriculture on the other),[204] but unfortunately pastoralist practices leave few traces in

[194] Sarpaki 2005, 336.
[195] Jameson et al. 1994, 503.
[196] Atherden et al. 1993, 353–5; Atherden and Hall 1994, 124–5. The 4th-century BC inscription *SEG* ix 2 (330–326 BC) lists Troizen and Hermion among cities receiving grain from Kyrene, but this does not necessarily argue for a reliance on imported grain (James et al. 1994, 265).
[197] Wagstaff and Gamble 1982, 101; Whitelaw 1994, 405, 1998, 234. On slopes between 10° and 15° cultivation of arable crops would have been possible without terracing, but may have caused severe soil erosion (Whitelaw 1998, 234).
[198] Sarpaki 2005, 336.
[199] Sarpaki 2005, 318. 336.
[200] Following the definition suggested by Penttinen 2005, 99, the term "pastoralism" is used in this study to describe "any type of reliance on livestock as sole or partial means of living".
[201] Forbes 1994, 190, 1995, 328.
[202] Chang 1992, 87; Forbes 1994, 190; 1995, 330; Foxhall 1996b; 2007, 82–3.
[203] Chang 1994, 354; Forbes 1994, 188, 1995, 325–6. On historical and ethnographic studies of pastoral practices in the Argolid, see Koster and Koster 1976; Koster 1977; Jameson et al. 1994, 290–301, on the potential and difficulties of using ethnographic literature in Classical studies, see Chang 1994, 354–5. 358–67; Penttinen 2005, 99.
[204] Halstead 1987; Hodkinson 1988, 38; Chang 1994, 353; Penttinen 2005, 99.

the archaeological record.[205] Reconstructing the type and extent of pastoralism in the ancient Argolid is therefore difficult. Classical or Hellenistic remains of sheep, goats, cattle and pigs were found at Lerna,[206] Nemea,[207] Porto Cheli (64)[208] and Prosymna: Pyrgouthi (69),[209] providing information on the species consumed, but not necessarily on specific pastoralist practices (**figure 8** and **table 2 f**).[210] Besides these archaeological finds, there is occasional evidence for pastoralism in literary and epigraphic sources, for example an early 2nd-century BC boundary dispute between Hermion and Epidauros,[211] which regulates grazing rights in a shared border area. Combining these sources, we can see that pastoralism was practiced in the Argolid throughout the period of study, but the exact strategies remain obscure.

In addition to pastoralism, archaeological and epigraphic sources occasionally also attest other ways in which "marginal" areas could be put to use. For example, a 2nd-century BC boundary dispute between Troizen and Arsinoe mentions wood cutting (**table 2 g**),[212] while 4th-century BC remains of hare and red deer at Nemea[213] and Porto Cheli (64)[214] suggest that these species were hunted and consumed in the Argolid (**figure 8** and **table 2 h**). Furthermore, sherds of beehives (**figure 8** and **table 2 i**) bear witness

[205] Isager 1992, 7. 83–5; Forbes 1995, 325; Penttinen 2005, 99.
[206] Gejwall 1969, 10. Remains of donkeys were also found at the site.
[207] Mackinnon 2013, 132. 137.
[208] Jameson et al. 1994, 287. 289; 2014, 205.
[209] Mylona 2005, 301. She also identified remains of a horse, a dog and some birds.
[210] The same applies to Hellenistic human remains from Asini (14), which indicate a high meat consumption (Edward et al. 1984, 45). In surveys, off-site "haloes" of worn artefacts may indicate the spread of manure and household waste as fertilizer, but this interpretation is still debated (Alcock et al. 1994, 149–70; Penttinen 2005, 99)
[211] *IG* IV^2. i 75 + *SEG* xi 405 + *SEG* xi 377 (early 2nd century BC). The inscription will be discussed in detail in section 5.1.
[212] *IG* IV^2. i 76–77 (2nd century BC).
[213] Mackinnon 2013, 132. 137.
[214] Jameson et al. 1994, 261.

to Classical or Hellenistic beekeeping at the fortifications of Prosymna: Pyrgouthi (69)[215] and Tsiorovos Dolianon (82),[216] as well as in the southern Argolid.[217]

Coastal areas also saw the exploitation of maritime resources (**figure 8** and **table 2 j–k**). Fishing and fish consumption are archaeologically most visible at Porto Cheli (64), especially through 4th-century BC fishbones[218] and fishing hooks,[219] but are also attested at Asini (14)[220] and possibly inland at Nemea.[221] In addition, the above-mentioned boundary dispute between Troizen and Arsinoe not only regulated rights to cut wood, but also made provisions for salt panning and tuna fishing,[222] while Athenaeus describes the Argolid as the best source of the sea fish κάπρος.[223]

2.4 The scene is set: the landscape of the Late Classical and Hellenistic Argolid

To sum up the results of this chapter, some aspects of the Argolid's landscape have remained constant over the last 2500 years, especially the basic underlying topography and the different species represented in the natural vegetation. Based on the similar distribution of ancient and modern olive cultivation, it is tempting to assume that the Late Classical and Hellenistic climate resembled modern conditions, but in fact climate and groundwater level are two environmental factors that are so far difficult to reconstruct.

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[215] Penttinen 2005, 33. 35. 46. 48.
[216] Jameson et al. 1994, 290. 447.
[217] Pritchett 1982, 76.
[218] Rose 2000, 530; Mylona 2008, 144.
[219] Jameson et al. 1994, 315; Mylona 2008, 137. According to Ath. 7.297e, the first catch of tuna at Halieis was dedicated to Poseidon (Jameson et al. 1994, 314).
[220] For Hellenistic fishing hooks from Asini (14), see Frödin 1938, 336.
[221] For Hellenistic or late Roman fishing hooks from Nemea, see Miller 1976, 184; 1980, 194; Mylona 2008, 138. In addition, fishbone of different species (picarel, small comber, sea bream, gilt-head, tuna, scombridae, grey mullet, moray, and eel) were identified at the sanctuary of Poseidon at Kalaureia on the island of Poros (Mylona 2008, 93–5; Marzano 2013, 298).
[222] *IG* IV^2. i 76–77 (2nd century BC). Jameson et al. 1994, 311; Harter-Uibopuu 1998, 97–109; Marzano 2013, 136.
[223] Ath. 7.288f. Mylona 2008, 133; *LSJ* s.v. κάπρος. There are also two intriguing Classical references to the transport of fish from Argos and the coast to Tegea, which may provide an interesting example of the fish consumption outside coastal areas (*IG* IV^2. i 123 (350–300 BC); Arist. *Rh*. 1365a. Jameson et al. 1994, 313; Marzano 2013, 298–9).

There are also marked differences between the modern and Late Classical or Hellenistic landscape. Probably the most striking developments are the local sea-level rise of up to 5 m, the alluviation at river mouths, the disappearance of the marshes at Tiryntha and Lerna, the soil loss in the upland areas, and the resulting deposition of sediments on the plains. Furthermore, pollen records make it possible to trace local changes in agriculture, for example the relative importance of cereals and olives.

While in its general outlines the modern Argolid might thus still be familiar to an ancient observer, specific areas have altered beyond all recognition. Re-examining the evidence for different landscape changes has demonstrated that at present our knowledge is very fragmentary, but nevertheless provides an initial working model for contextualising the region's Late Classical and Hellenistic fortifications.

CHAPTER 3: A TYPOLOGY OF ANCIENT FORTIFICATIONS

3.1 Ancient terminologies and modern typologies

As noted in the introduction, most fortifications in the Argolid owe their "discovery" to 19th-century travelling scholars. Before detailed maps were widely available, rural Greece could be very challenging to navigate, but in 1817 Sir William Gell (by then a seasoned traveller) published a collection of detailed itineraries, which not only included travelling times and important landmarks, but also brief descriptions of the ancient remains a visitor would encounter en route. One of the suggested itineraries leads from Nafplio to the village of Lygourio. During the course of this ca. 6-hour journey, a visitor could see no fewer than seven ancient fortifications — sites that could hardly be more varied and include the substantial "*palaia kastra*" at Agios Adrianos (3), Kazarma (39) and Kastraki (35), as well as a rectangular tower at Pyrgouli (71), a circular tower at Choutalaiika (18), and a pyramidal structure at Lygourio 1 (49).[224]

Both the wealth and the variety of ancient fortifications mentioned along this route are characteristic of many areas in the Argolid. No fewer than 146 fortified or possibly fortified sites are currently known from the region, ranging from impressive city walls to small rural towers,[225] while further sites may still remain to be discovered under the alluvial fill of the Argive plain or the dense vegetation of the surrounding mountains.

[224] Gell 1817, 185–6.

[225] In addition to these 146 fortified structures, twelve sites in the Argolid were previously misidentified as fortifications: Agios Ioannis (147) (which is only mentioned by Φαράκλας 1973, E. 2.4, probably due to a misinterpretation of Meyer 1930, 2066 and Simpson 1965, 22), Agios Vasileios Kastro (148) (where Gauvin 1992, 136 figure 7.2. 137 figure 7.3. 138 figure 7.4 proposed a fort, but no ancient remains could be identified by subsequent scholars (Πέππα 1993, 153; Bynum 1995, 110–1; Πίκουλας 1995, 51; Marchand 2002b, 246)), Apesas (149) (previously mentioned as the site of an ancient fortified settlement (Gauvin 1992, 136 figure 7.2. 137 figure 7.3. 138 figure 7.4), but in fact the site of a Frankish fort (Πέππα 1993, 159–60; Marchand 2002b, 214–6)), Asprochoma (150) (interpreted as a tower by Steffen and Lolling 1884, 18, but now identified as a sanctuary (Iakovides and French 2003, 39)), Kenchreai (151) (where Πέππα 1990,

One of the first challenges of working with such a large and heterogeneous corpus of material is to find a suitable terminology. Ancient literary and epigraphic sources attest a detailed vocabulary for defensive structures,[226] but many terms describe fortifications with a certain function rather than with a specific, archaeologically recognisable layout.[227] In addition, a single term can often refer to structures built for different purposes,[228] and may not be used consistently by different authors.[229]

Recognising the difficulties of the ancient terminology, several modern typologies have been proposed for ancient fortifications. For example, R. Frederiksen recently suggested a division of Archaic fortified sites into settlement fortifications (including second-order settlements and private farms), fortifications of a city-state's territory (forts and towers) and regional defences.[230] This division is finely nuanced and incorporates both urban and rural sites, but, like the ancient terminology, soon reaches

168–9 noted an "ancient" drystone wall, which is probably more recent (Πίκουλας 1995, 271)), Kephalari (152) (previously believed to be a tower (Steffen and Lolling 1884, 18; Wiseman 1978, 119; Tausend 2006, 22–3), but now identified as a sanctuary or shrine (Bynum 1995, 115; Marchand 2002b, 66)), Kosmas (153) (interpreted by Χρηστού 1963, 87–8; Simpson 1965, 52; Παπαχατζής 1976, 417; Shipley 1996, 282 as a fort, but now identified as the sanctuary of Apollo Maleatas (Φάκλαρης 1990, 179–83; Pritchett 1991a, 155; Shipley 1996, 282)), Lophos Kokkinou (154) (where G. Gauvin claimed to have seen a polygonal tower (Gauvin 1992, 136 figure 7.2. 137 figure 7.3. 138 figure 7.4; Gauvin and Morin 1997, 5–7), but according to Marchand 2002b, 247–8 all stones appear natural), Phousia (155) (where Tausend 2006, 160 suggested a fortification, but no remains of walls could be identified), Tou Antreiomenou to Mnema 2 (156) (where owing to the limited visible remains an interpretation as watchtower (proposed by Tausend 2006, 154) is very speculative), Tourkopigadou (157) (previously seen as a fortification (Russell 1924, 44; Gauvin 1992, 142; Πίκουλας 1995, 233), but judging by the surface finds probably a *villa rustica* (Πίκουλας 1995, 233; Cloke 2016, 818) and Tracheia (158) (where a wall noted by Φαράκλας 1972a, E. 3.7 is probably a terrace wall or field boundary). These twelve sites are included in the final section of the catalogue.

[226] For example ἔρυμα, πύργος, περιπόλιον, σκοπία, τείχισμα, τεῖχος, φρούριον, φυλακτήριον or χωρίον. Maier 1959, 78–82; Robert 1970, 598; Nowicka 1975, 7; Debord 1994, 53–61; Frederiksen 2011, 10–13. 20–25; Fachard 2012, 241; Frederiksen et al. 2016, 179–80.

[227] For example, φυλακτήριον can refer both to parts of larger fortifications (Thuc. 4.110; Arist. *Ath*. 1331a20) and to independent guard posts (Thuc. 4.31).

[228] For example, the term φρούριον is used for garrison forts, mountain refuges and fortified settlements (Lawrence 1979, 172; Pimouguet-Pédarros and Geny 2000, 113–5; Nielsen 2002). For the different meanings of χωρίον as "place, spot" and "stronghold", see Pimouguet-Pédarros and Geny 2000, 111–3.

[229] Fachard 2012, 241.

[230] Frederiksen 2011, 9–17.

its limits when applied to fortified sites of uncertain function. For example, we will see in chapter 6 and 7 how difficult it can be to distinguish fortified farms from "strategic-military" towers in territorial defensive networks. This problem illustrates why a regional study which aims to investigate the purpose of ancient fortifications initially requires a typology based on archaeological criteria rather than a site classification that focuses on the fortifications' functions.[231]

3.2 Fortified settlements, forts, towers and drystone circuits

A very good example of such an "archaeological" typology is S. Fachard's classification of the fortifications of Eretria into four types: fortified settlements, forts, towers and drystone circuits.[232] The first term — "fortified settlements" — describes nucleated settlements surrounded by defensive walls. These sites are characterised by remains of dwellings, public monuments, streets and cisterns, as well as finds that indicate production, permanent occupation and domestic activities (for example oil and wine presses, beehives or loomweights). Graves and funerary monuments outside the walls can also help to identify fortifications of this type.[233]

These "fortified settlements" include major sites protected with city walls, which can have a strong urbanistic and symbolic significance.[234] However, the practical military

[231] McCredie 1966, 88–99 divided Attic rural fortifications into garrison forts, fortified demes, refuges, fieldworks and military camps, but this typology does not include towers and lacks a detailed description of the archaeological characteristics of each type.
[232] Fachard 2012, 242–253. A revised typology, proposed in Fachard 2016a, 215–222, also includes non-urban long walls as a fifth category, but such structures are rare in the archaeological record (Fachard 2016a, 222) and have so far not been identified with any certainty among the Late Classical and Hellenistic fortifications in the Argolid.
[233] Fachard 2012, 244–7; 2016a, 215–6.
[234] For a summary of these functions see Müth 2016a; 2016b; Müth et al. 2016. The importance of city walls for the perception and identity of ancient cities is also reflected in ancient iconography, where walls could be used as a *pars pro toto* for the entire city (Müth et al. 2016, 128). However, Camp 2000, 43–4 probably went too far in suggesting that some walls (for example at Herakleia at Latmos) were "built purely as an item of prestige and civic pride". For the strategic concepts at Herakleia at Latmos, see McNicoll 1997, 77

role of these structures should not be underestimated. Throughout the Classical and Hellenistic period, sieges belong to the cruellest forms of ancient warfare and involved not only fighting men-at-arms, but all inhabitants of a city,[235] often facing crowded conditions or starvation.[236] Nor was a city's "civilian" population exempt from the consequences of defeat:[237] If a city surrendered, its population would usually be allowed to depart (albeit without property), whereas resistance could result in the mass enslavement or even massacre of the settlement's inhabitants.[238] This practice highlights the role of urban fortifications for the survival of a city and forms the background to the Hellenistic perception of city walls as guarantors of a city-state's autonomy.[239]

"Forts" — the second category in S. Fachard's typology — were built primarily for military purposes. Often strategically located, these sites lack evidence for domestic activities, public buildings or funerary monuments,[240] and tend to be smaller in size than fortified settlements.[241] Forts and fortified settlements thus form two distinctive types, but their functions can sometimes overlap. For example, literary and epigraphic sources mention military garrisons at fortified settlements,[242] while some forts served as refuges for the rural population in times of conflict.[243]

Thanks to literary and epigraphic sources, we know that Late Classical and Hellenistic forts could vary considerably in terms of garrison strength. Some

[235] Kern 1999; Wees 2004, 149; Jansen 2016, 105.
[236] Both private property and the inhabitants themselves were considered the rightful spoils of the victor (Kern 1999, 134–62; De Souza 2007, 459; Strauss 2007, 245).
[237] See, for example, Xen. *Cyr*. 7.5.73 and Xen. *Mem*. 4.2.15. Rihill 1993, 79; Krentz 2007, 181; Ducrey 2016, 332–3.
[238] See, for example, Volkmann and Horsmann 1990; Pritchett 1991, 152–7. 203–312; Ducrey 1999, XV. 107–47; Kern 1999, 135–62; Payen 2012, 132–78; Ducrey 2016, 333–4.
[239] For example, *SEG* xxxviii 1476 (206/5 BC). Ducrey 1986, 186–7; Ma 2000, 339–43; Chaniotis 2005, 18–9. 26.
[240] Fachard 2012, 242–4; 2016a, 216–20.
[241] Coulton 1996, 161; Fachard 2012, 241–2. 245.
[242] Lawrence 1979, 137–40; Πετράκος 1999, 164–74; Chaniotis 2005, 88–93; Oliver 2007, 148–53. 176–9; Fachard 2012, 247; 2016a, 215.
[243] For example, at Thalamai in Elis in 219 BC (Polyb. 4.75.2–8) or in Attica (Dem. 18.37–8).

fortifications are said to have housed several hundred men,[244] while others were manned by far more modest garrisons. For example, a 3rd-century BC fort at Kyrbissos in Ionia probably accommodated no more than ca. 20 men and 3 dogs.[245] However, reliable sources that record the exact strength of ancient garrisons are rare and usually refer to troops stationed at allied and dependent city-states[246] or at "offensive" fortifications.[247]

To estimate the number of men that would have been stationed permanently at the forts in the Argolid, we thus largely rely on the archaeological remains themselves. Rural forts have only rarely been studied in detail,[248] but one important exception is the late 6th- or early 5th-century BC fort at Phylla (Vrachos) on Euboia, where a rectangular building of 20 rooms has convincingly been identified a barrack for ca. 200 men (ca. 2.63 m^2 per person).[249] This building covers ca. 3.12% of the total area of the fort[250] — a percentage that, interestingly, is paralleled at other rural forts.[251] Cautiously using these

[244] For example, 300 Spartans were sent to Epidauros in 419 BC (Thuc. 5.56), while 1000 Athenians were stationed at Pylos in 425 BC (Thuc. 4.5).
[245] *SEG* xxvi 1306 (3rd century BC). This is perhaps the only known inscription that records the exact strength of a garrison (Robert and Robert 1976, 206). For the use of guard-dogs in ancient fortifications, see Roussel 1930, 364–6; Robert and Robert 1976, 207–9.
[246] For example, 300 Spartans at Epidauros in 419 BC (Thuc. 5.56), 400 Achaeans (and 50 dogs) under Aratos of Sikyon at Acrocorinth in 251 BC (Plut. *Arat*. 24), 500 Corinthians at Leukas and Ambrakia in 425 BC (Thuc. 4.42), or 500 Athenians at the fort at Delphinium on Chios in 407 BC (D. S. 13.76).
[247] For example, 1000 Athenians at Pylos (Thuc. 4.5).
[248] See, for example, the difficulties in identifying rural forts in Attica (Sapouna-Sakellaraki et al. 2002, 113).
[249] Coulton 1996; Sapouna-Sakellaraki et al. 2002, 28–43. 111–3. The interpretation of Building 3 as barracks had already been suggested before the excavation of the site (see for example Lawrence 1979, 176), but was not generally accepted (for a previous interpretation of the building as stoa, see for example Tritle 1992, 145).
[250] The total area measures ca. 1.7 ha (Fachard 2012, 300).
[251] For example at the Classical or Hellenistic fort of Psilo Lithari on Euboia (with a total size of 0.25 ha and possible barracks covering 72 m^2 or ca. 2.9 % of the total surface area (Fachard 2012, 135–7)), the Hellenistic fort at Megalo Vouno in Boiotia (with a total size of 1.83 ha and possible barracks of 25 rooms "similar in size to those of Building 3" (Sapouna-Sakellaraki et al. 2002, 112), so covering ca. 3.6 % of the total surface area (Bakhuizen 1970, 79–84. 92–5)), the fort of Tsouka Madhari (with a total size of 0.7 ha and possible barracks covering at least 130 m^2, so at least 2 % of the total surface area (Bakhuizen 1970, 74–6)), and the Late Classical fort of Galatas: Megali Magoula (25) in the Argolid (with a size of ca. 0.09 ha and possible barracks covering 28 m^2 or ca. 3.3 % of the total surface area (Konsolaki-Yiannopoulou 2010, 69)).

figures — 3 % of the total surface area (in m^2) multiplied by 0.38 — as a guideline to estimating the strength of rural forts, the garrisons in the Argolid appear to have been comparatively small, perhaps as few as 16 men at Agios Adrianos (3), 40 men at Kastraki (35) or Kazarma (39), or 140 men at Ano Phanari (10). In terms of numbers, these garrisons are dwarfed by Classical field armies,[252] and even when examples such as the famous defence of Plataia in 427–425 BC are taken into account,[253] it is doubtful whether just 40 men could have held a fort like Kazarma (39) or Kastraki (35) for any amount of time. This tentatively places the sites in the context of "small scale" border conflicts, a hypothesis that will be explored in detail in chapter 6.

Towers — rectangular or circular structures with a considerably greater height than diameter or width — form the third category.[254] Buildings of this type are known from most regions of the Greek mainland and the islands,[255] but are difficult to interpret. In line with the military focus of traditional fortification research, they were often considered part of civic defensive networks,[256] defining and controlling borders[257] or serving as watchtowers[258] and signal-stations.[259] However, many towers are ill situated for these purposes[260] and may have fulfilled other functions, such as guarding mines, quarries, fuel supplies or agricultural areas.[261]

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[252] For example, the Spartan expedition against Argos in 418 BC with the full Spartan levy as well as 11000 men from Boiotia, 2000 men from Corinth, forces from Sparta's allies in Arkadia, Megara, Sikyon, and Pellene, and the full levy of Phleious (Thuc. 5.57–63).
[253] According to Thuc. 2.2–6. 71–8. 3.20–5. 52–68, the city of Plataia was successfully defended by only 260 men.
[254] Fachard 2016a, 220.
[255] See, for example, Morris and Papadopoulos 2005, 155.
[256] Ober 1985; Kallet-Marx 1989, 301–11; Fossey 1992, 109–32; Gauvin 1992; Munn 1993.
[257] Winterberger 1892; Munn 1993, 25–32.
[258] For example, in Attica (Vanderpool 1978; Lohmann 1989a; 1993, 40), the Phokis (McInerney 1999), Boiotia (Snodgrass 1985; Kallet-Marx 1989) or Akarnania (Wacker 1999).
[259] For example, between Lebadeia and Delphi (Lawrence 1979, 189), south of Lake Kopais (Fossey 1992) or between the border fortress of Eleutherai and Athens (Winter 1971, 43–5; Ober 1985, 191–207).
[260] Young 1956, 132; Morris and Papadopoulos 2005, 158.
[261] Fachard 2016a, 220. For towers connected to mines, see for example Attica (Osborne 1985a, 31–34; Morris and Papadopoulos 2005, 173–4), Andros (Τελεβάντου 1996, 49–53) or Siphnos

The fourth and perhaps most challenging category in S. Fachard's typology is circuits in drystone masonry, which are usually located on hilltops and often lack access to fresh water or agricultural resources.[262] Comparatively quick to build,[263] they probably fulfilled various temporary defensive or offensive objectives, for example as refuge sites[264] or temporary camps.[265] Since such sites were only used sporadically, drystone circuits usually lack surface pottery or internal structures, and are consequently very difficult to date and interpret.[266]

3.3 Safety in numbers: the distribution of fortifications in the Argolid

Applying this typology to the 146 fortified or possibly fortified sites in the Argolid, it becomes clear that towers are the most widely represented and distributed type of rural fortification (**figure 9**). However, out of the 86 ancient towers in the Argolid, 13 (15.1 % of all "towers") cannot be securely identified (**table 3**). A further 14 towers (16.3 % of all towers) are recorded, but no longer exist, while 17 towers (19.8 % of all "towers")

(Ashton 1991; Birkett-Smith 2000); for towers connected to agricultural production, see Siphnos (Δραγάτσης 1915; 1920) or Attica (Young 1956, 140). Πύργοι are frequently noted in literary and epigraphic sources as parts of farm complexes, for example as part of leased estates in Late Classical and Hellenistic contracts (Attica: *SEG* xii 100, 74–5 (367/6 BC). Delos: *IG* XI. ii 287, 154. 165 (250 BC); *ID* 3 1417 (155 BC). Tenos: *IG* XII. v 871, 61–2 (1st century BC)). Young 1956, 133–4; Nowicka 1975, 20; Pritchett 1991b, 353–4; Morris and Papadopoulos 2005, 166. Furthermore, πύργοι are mentioned as part of estates in Hellenistic and Roman papyri (for example, *BGU* I 298.6 (AD 173/4), *BGU* III 889.13 (after 151 BC), *BGU* VI 1280.11 (before 210 BC), *BGU* XI 2054.11 (AD 184–92), *P. Mich.* III 212.17 (2nd or 3rd c. AD) and *P. Tebt* III 779.11 (171 BC)). For further examples see Nowicka 1975, 21. However, it is debatable whether πύργοι in Graeco-Roman Egypt are comparable to the structures on the Greek mainland or the islands (Preisigke 1919; Alt 1920; Meyer 1920; Hasebroek 1922; Grimal 1939, 43; Young 1956, 133; Nowicka 1970; 1974, 175–8; 1975, 20–1; Morris and Papadopoulos 2005, 166).

[262] Fachard 2012, 251–3; 2016a, 220–1.

[263] Fachard 2016a, 221.

[264] McCredie 1966, 92–3; Hanson 1998, 112; Fachard 2012, 252–3.

[265] McCredie 1966, 96–100; Lawrence 1979, 162–4; Fachard 2012, 252–3; 2016a, 221.

[266] Fachard 2016a, 221. One common difficulty is distinguishing ancient fortified structures from post-antique pastoralist structures, for example sheepfolds (mandres). However, with a size between 0.05–0.28 ha the drystone circuits in the area of study are considerably larger than Roman or modern sheepfolds. For the size of pastoralist structures, see Kron 2010, 183; Daly 2015, 24.

could not be located and may have been destroyed since they were last referred to in a scholarly publication (**table 3**).

The surviving 74 towers differ considerably in shape and size (**table 3 and figures 10–1**). Rectangular towers predominate with 66 known examples (76.7 % of all towers), including the famous "pyramids" at Elliniko: Kephalari (23), Lygourio 1 (49) and Dalamanara (131).[267] The width of these rectangular towers varies considerably between an impressive 15 m at Marmaralono Agiou Petrou (102) and a mere 4.4 m at Ano Phanari: Vigliza (11). Circular towers are much rarer (8 towers, 9.3 % of all towers) and usually smaller.[268]

Both types of towers are largely clustered to the north, west and east of the Argive plain, rather than being evenly distributed throughout the region (**figures 10–1**). On the plain itself, as well as in the southern Akte, the northern Epidauria and in the Kynouria towers are rare or entirely absent among the surviving fortifications, although this pattern may in part be a result of the extensive post-Hellenistic alluvial deposits on the Argive plain[269] and the intensive agriculture and development in the southern Argolid and the Epidauria.

Among the three remaining types, fortified settlements make up the largest group, with 28 securely identified and six possible examples (**figure 12** and **table 4**).[270] The

[267] The architecture of these structures will be discussed in detail in chapter 7.
[268] They measure between 5 and 12 m in diameter.
[269] See chapter 2.
[270] The possible examples include Lygourio 2 (100) (where the lack preservation makes it difficult to distinguish between fortified settlement and fort (Καββαδίας 1885, 21–3; Frazer 1898, 232–3; Frickenhaus and Müller 1911, 30; Παπαδημητρίου 1951, 212; Κριτζάς 1972b, 219; Παπαχατζής 1976, 197–9; Foley 1988, 186–7; Πιτερός 2005b, 268)), Nea Epidavros: Brinia (120) (which could not be located and may have been destroyed since it was referred to in Πιτερός 2004b, 58–9), Pigadaki (123) (which was mentioned by Φαράκλας 1972a, E. 3.2 and may be identical with the site recorded by Πιτερός 2004b, 58–9), Petrothalassa (138) (which was recorded by Φαράκλας 1973, 23. E. 2.3; Foley 1988, 196; Jameson et al. 1994, 483–4 and has produced fragments of sculpted marble, but has since been destroyed), Petrothalassa: Kypraiou (139) (identified as a possible fortification by Jameson et al. 1994, 484, but now destroyed) and Skala 2 (142) (which has produced Prehistoric, Hellenistic and later sherds (Pritchett 1980, 15;

most striking difference between the individual fortified settlements is their surface area, which varies from just 0.2 ha at Prosymna: Agios Athanasios (67) to perhaps as much as 100 ha at Argos (12)[271]. Circuits enclosing an area of more than 10 ha occur at Kleonai (41), on the Argive plain, along the Saronic Gulf and on the east coast of the Argolic Gulf, but are absent on the plain of Prosymna and in the western part of the region. In some cases, the surface area seems to correlate to a site's political status — for example circuits of more than 12 ha are largely limited to the urban centres of the six city-states in the region.[272]

Moving on to the third category, there are at least 13 forts in the region (**figure 9** and **table 5**).[273] They are mainly located in the eastern Argolid, where towers are rare. This may suggest that towers and forts were constructed in different areas to fulfil similar functions — a hypothesis that will be investigated further in chapters 6 and 7.

The fourth and final type of fortification are drystone circuits (**figure 9** and **table 6**). Like the forts, the twelve recorded examples in the Argolid display a marked east-west divide with a lack of sites in the western part of the region.[274] Drystone circuits were constructed both in strategic locations (for example at passes)[275] and at sites that show

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Πίκουλας 1995, 189) but no *in-situ* remains of Classical or Hellenistic buildings). Among the securely identified sites, Sporitza (74) lacks small finds, but was classified as a fortified settlement due to its substantial size of ca. 2 ha. Small finds and internal building remains are also missing at Kyparissi (44), but this may largely be due to a lack of previous research.

[271] On the different reconstructions of Argos' city walls (12), see section 6.3.2.

[272] The walls at Mykinai (51), which enclose an area of ca. 17.3 ha, are an exception.

[273] At one of the 13 sites (Kastro tis Palaiopanagias (38)), the absence of finds and internal structures could be the result of later building activity or a lack of research. The site's identification as a fort rather than a fortified settlement is thus not entirely conclusive. Besides these 13 sites, one further possible fort (Strongylo (125)) is mentioned by Russell 1924, 44, but could not be located by Pritchett 1969, 98; Πίκουλας 1995, 229 and may in fact be identical with the tower at Tourkovrysi (78).

[274] The only two drystone circuits in the western part of the region are Vigliza (85) and Aitolithi (130) (now destroyed). On the issues of dating drystone circuits, see chapter 4.

[275] One example is the drystone circuit of Kastro 2 (37), which is located on the pass between Lygourio and the Arachaion mountains. The connection between fortifications and passes will be discussed in detail in section 6.2.

no obvious military value, suggesting that even such simple structures may have served a variety of functions.

Overall, the fortifications' distribution pattern thus indicates that the four different architectural types were not necessarily connected to specific defensive purposes, and that one and the same strategic requirement could be met through different structures. To understand the complex picture that emerges here, we must firstly, however, step back and consider the dating of the Argolid's ancient fortifications, before returning to an analysis of specific sites in chapters 6 and 7.

CHAPTER 4: DATING ANCIENT FORTIFICATIONS IN THE ARGOLID

4.1 Dating ancient fortifications: a persistent problem

On the 23rd March AD 1448 Ciriaco de' Pizzicolli, better known as Cyriacus of Ancona, set out in search of ancient Mycenae. After seeing "a great number of remarkable remnants of antiquity", he visited Agios Adrianos (3),[276] a small fort on the main eastern route to the Argive plain. Cyriacus' visit and subsequent description make the site one of the first fortifications "studied" in the Argolid, but even after more than 500 years of scholarship the date of its walls remains unclear.

Unfortunately, the uncertainties that surround the construction of Agios Adrianos (3) are by no means unusual. Dating defensive structures is one of the central problems of Greek fortification studies,[277] especially in rural areas that have suffered a lack of excavation and systematic collection of surface finds.[278] Even chronologies of masonry styles[279] — often a last resort for assigning otherwise undatable structures to broad historical periods — have provoked increasing criticism over the last decades.[280]

As outlined in the previous chapter, no fewer than 146 fortifications were so far identified in the Argolid. Most of these sites have previously been associated with one or several periods between the Early Iron Age and the Roman conquest in 146 BC,[281] but the basis of these dates varies greatly from site to site and only few structures are securely dated. To address this problem, the present chapter aims to collect the dating evidence

[276] Diary V 66–9. Bodnar and Foss 2003, 337–9.
[277] Frederiksen 2011, 62.
[278] For example in the territory of Phoinike (Giorgi and Bogdani 2012, 309–322), in the territory of Eretria (Fachard 2012, 256–62) or on Crete (Coutsinas 2013, 131–47).
[279] Especially the chronologies of Scranton 1941 and Winter 1971, 69–100 (see below).
[280] For example, McNicoll 1997, 3; Pimouguet-Pédarros and Geny 2000, 70–1; Ley 2009, 179. 200–15; Frederiksen 2011, 65–8; Fachard 2012, 257–60; Brasse and Müth 2016, 76.
[281] Dates previously suggested for individual sites are summarised in the catalogue.

for all 146 fortified sites recorded in the region, drawing on written sources, stratified material, surface finds, architecture and masonry styles. Based on this material, it will for the first time be possible to study the chronology of all fortifications in the region within a consistent framework.

4.2 Turning to the texts: dating by literary and epigraphic sources

In the summer of 418 BC, when Argos was heavily involved in military campaigns against its arch-enemy Sparta, the Epidaurians decided to seize the moment and invaded the Argive territory. But they had reckoned without Argos' allies — the Mantineans, Eleans and Athenians — who in turn invaded the Epidauria and constructed a fort at Epidauros.[282] After lying hidden for many centuries, this fort was rediscovered during excavations at Palaia Epidavros,[283] and thus provides a rare example of a securely dated fortification in the Argolid.

Such construction or destruction narratives from building inscriptions or literary sources are the gold standard for dating ancient fortifications in the Mediterranean. Unfortunately, however, the surviving literary and epigraphic sources only seldom include enough detail to draw clear connections between the structures mentioned in such texts and the archaeological remains.[284] For example, the destruction of ancient Hysiai in 417 BC — mentioned by Thucydides and Diodorus — seems to imply a *terminus ante quem* for the surviving walls at modern Achladokampos (1),[285] but at least one tower at the site in fact belongs to a Late Classical or Hellenistic building phase.[286] Similarly, a

[282] Thuc. 5.75.4–6.
[283] Palaia Epidavros 2 (55). Καζά-Παπαγεωργίου and Προσκυνητοπούλου 1981, 105; Σαρρή 1997, 153; Προσκυνητοπούλου 2011, 77.
[284] Pimouguet-Pédarros and Geny 2000, 25–32; Fachard 2012, 260. On literary and epigraphic evidence in general, see Pimouguet-Pédarros and Geny 2000, 23–8, for a collection of "building inscriptions", see Maier 1959.
[285] Thuc. 5.83.2; D. S. 12.81.1.
[286] For the date of the "hexagonal" tower at Achladokampos (1), see below.

3rd-century BC inscription records that Argos borrowed 100 talents from Rhodes to improve its fortifications and cavalry (probably in 304 BC), but it is only thanks to recent archaeological excavations that this loan can be associated with the triangular bastion on the city's Aspis.[287] If we exclude cases such as Argos and Hysiai, only one further fortified structure besides the fort at Palaia Epidavros can be securely dated through written evidence — the *diateichisma* at Troizina (80) (**figure 13**), which is explicitly mentioned in a 2nd-century BC *epidosis* decree.[288]

4.3 Securing a date: dating by stratified and surface finds

Since literary and epigraphic sources thus provide only two fixed points in the chronology of the 146 fortifications in the Argolid, archaeological dating evidence — especially stratified finds — becomes particularly important for dating the region's fortified structures. According to stratified finds, the drystone walls on the Barbouna hill and the acropolis at Asini (14–15) are currently the oldest datable fortifications among the 146 sites included in this study. Both structures are dated though foundation deposits to ca. 720 BC (**figures 14–9**).[289] Also attributable to the Archaic period are the mudbrick walls on the "Industrial Terrace" and in the lower town of Porto Cheli (64) (ancient

[287] For this inscription (*SEG* xix 317 = xxv 361 = xxx 358 = xli 278 (ca. 300 BC)), see Vollgraff 1916; Maier 1959, 145–8; Scranton 1941, 165; Marsden 1969, 144; Migeotte 1984, 81–4; Piérart and Touchais 1996, 64; Fachard and Bessac (forthcoming). For the recent stratigraphic dating of the triangular bastion, see Fachard and Bessac (forthcoming). I am very grateful to Dr Sylvian Fachard and Dr Jean-Claude Bessac for generously sharing a draft of their chapter on the Aspis fortifications in advance of its publication.

[288] Polyb. 39.8. Frickenhaus and Müller 1911, 31; Welter 1941, 12; Maier 1959, 139–45; Winter 1971, 114; Lawrence 1979, 150; Sokolicek 2009, 132.

[289] On the Barbouna hill, an assemblage of four kraters, a cup and an amphora were placed next to the circuit (Wells 1988, 261–2), while a similar pottery assemblage was discovered near the entrance to the acropolis (Frödin 1938, 330–3; Wells 1988, 262–4; Coldstream 2008, 131–3. 330). A deposit of Geometric pottery found in the 1920s near the east circuit of the Barbouna hill was previously interpreted as a grave, but may in fact be a third foundation deposit (Frödin 1938, 152; Wells 1988, 264).

Halieis), where stratified sherds provide a 6th-century BC *terminus ante quem*.[290] An earth embankment at the southeast corner of the site probably dates to the same period.[291]

After the end of the Archaic period, stratified finds are lacking at fortifications in the Argolid until the late 5th and the early 4th century BC, when new defensive structures were constructed on the acropolis of Asini (14),[292] at Argos (12),[293] Galatas: Megali Magoula (25),[294] Lygourio 1 (49),[295] and Porto Cheli (64).[296] Four further buildings or construction phases belong to the latter part of the 4th century BC: the tower at Prosymna: Pyrgouthi (69) (built at some point between the late 4th century BC and the 260s BC),[297] the triangular bastion on the Aspis of Argos (12) (dated to ca. 330/25–290 BC during the recent excavations by the French School at Athens),[298] the Southeast Tower and the adjacent polygonal circuit at Asini (14) (around 300 BC)[299] and the southeast and

[290] McAllister 2005, 17–8.
[291] This earth rampart is cut by a wall around an Archaic well and includes Corinthian sherds (possibly 6th-century BC) in its top layers (McAllister 2005, 18).
[292] At Asini (14), the ashlar masonry phase (previously believed to be Roman (Frödin 1938, 48–57)) was dated by pottery inside the wall's fill to the period between the late 5th- and the mid 4th-century BC (Πιτερός 1996a, 90).
[293] Judging by the discovery of a terracotta figurine, the western polygonal wall of Argos' Larissa belongs to the last third of the 5th century BC at the earliest (Garlan 1966, 147).
[294] At Galatas: Megali Magoula (25) — originally built in the Middle or Late Helladic period — two round towers and a three-roomed building were added in the Late Classical period (Κονσολάκη-Γιαννοπούλου 2003, 162, 2009, 506; Konsolaki-Yiannopoulou 2010, 69).
[295] When the tower of Lygourio 1 (49) was excavated in 1937, no pottery later than the late 5th or early 4th century BC was discovered below the floor level of the entrance corridor (Scranton 1938, 528). A silver coin of Epidauros was recorded under the floor of the second building phase (Scranton 1938, 528), but cannot be securely dated. For the date of the coin, see Babelon 1901, III. 490 nr. 682. Lygourio 1 (49) shares its unusually tapering base with Elliniko: Kephalari (23) and Dalamanara (131), suggesting a similar date for all three structures.
[296] At Porto Cheli (64), 4th-century BC pottery was found above the bedrock cuttings for the "chambered curtain", suggesting a 5th-century BC date (McAllister 2005, 64–5. 79). Furthermore, the square predecessor of Tower 6 may be associated with the so-called "Acropolis Deposit 5" (dating to 410–390 BC (McAllister 2005, 79)), but as the acropolis area has not yet been published in detail, this link remains uncertain. A further wall that has been dated through stratified finds to the Classical period belongs to the northern circuit of Agios Andreas (4) (Γρηγορακάκης 2010, 642), but the results of the recent excavations at this site have so far not been published in detail.
[297] Penttinen 2005, 64.
[298] For the date of the walls on the Aspis, see Fachard and Bessac (forthcoming).
[299] This tower is dated by finds in the surrounding construction layer (Wells 1992, 139; Penttinen 1996b, 153–4. 158. 166–7), especially the skyphos fragments 22 and 23, which are the latest dateable sherds from the layer. Skyphos 22 is comparable to a vessel from the Athenian Agora

"middle" walls at Porto Cheli (64).[300] Furthermore, excavations have revealed a period of Late Hellenistic reuse at the lower citadel of Tiryntha (76).[301]

A final fortification that should briefly be mentioned in relation to stratified finds is the drystone circuit at Phranchthi (62). This site has so far not been excavated, but during the *Southern Argolid Survey* a Classical or Hellenistic sherd was found in the fill of the wall. Based on this find, a construction in the Classical or Hellenistic period was tentatively suggested, but it remains unclear if this sherd is *in situ* or intrusive.[302]

In the absence of stratified finds and written sources, unstratified surface material can give some indication of a structure's date. However, this material has to be treated with some caution, as it may be heavily influenced by post-depositional changes, accessibility, surface visibility, and modern recording or sampling strategies.[303] At most fortifications in the region, the surface material recorded so far attests a long occupation history, making it impossible to connect the built structures to any specific period.[304] Only at sixteen sites does the surface material cluster in any particular period, and thus provides a tentative construction date in the Geometric, Classical, Late Classical or Hellenistic period.[305]

(300–275 BC; Rotroff 1997, 257–8 nr. 152), while skyphos 23 resembles three vessels from Corinth (ca. 310 BC; McPhee 2012, 186–8 nr. VI–14, VI–17 and VI–38).

[300] The southeast circuit is dated through sherds in the core of the wall (McAllister 2005, 51), while the middle wall is dated by a coin of Hermion in the upper part of the stone fill (McAllister 2005, 56). Blocks from this wall were reused in mid 4th-century BC houses, indicating that the wall was built before the middle of the century (McAllister 2005, 55).

[301] Kilian et al. 1981, 153; Kilian 1988, 105–6.

[302] Jameson et al. 1994, 475.

[303] On the limitations of surface surveys in general, see Cherry 1983, 397–400; Simpson 1984, 116; Wallace-Hadrill 1991, xvi–v; Hayes 2000, 45; Millett 2000, 53; Terrenato 2000, 60; Banning 2002, 46–8. 63; Given 2004, 16–19; Witcher 2006, 45. For the sampling strategies used in the Argolid, see Wright 1990, 604–8; Goester 1993, 97; Jameson et al. 1994, 224–8; Wells 1996, 15–22; Cloke 2016, 45–69.

[304] For the date of surface finds at individual fortifications, see the catalogue of sites.

[305] The Classical sites include the drystone circuit at Soros (72) (Jameson et al. 1994, 521–2; Γιαννοπούλου 2009, 534), the possible fortified settlement at Petrothalassa: Kypraiou (139) (Jameson et al. 1994, 484) and perhaps the fort at Anathema (8), where only very little datable pottery has so far been published (Dixon 2000, 257). The fortified settlements at Iliokastro (29) (5th-century to late 3rd- or early 2nd-century BC (Jameson et al. 1994, 519–21)) and Prosymna:

4.4 Building a chronology: dating by architectural features

In addition to written sources and archaeological finds, the sites' defensive architecture itself can be of great chronological significance. As the wealth of Greek city-states grew, siege- and fortification-techniques were gradually refined from Classical times onwards, a development that reached its climax in the Hellenistic period.[306] A detailed description of these changes is beyond the scope of the present study,[307] but it is possible to highlight some architectural features that can be connected to specific technologies or securely dated parallels.

The comparatively simple layout of Archaic and Classical fortifications makes it difficult to find meaningful parallels during these periods.[308] Comparisons to datable fortifications outside the Argolid therefore only really come into play from the Late Classical period onwards, with the 4th-centuy BC overlap gate at Kastraki (35) (**figure 20**), which is comparable to the gates B and D at Mantineia (**figure 21**),[309] or the towers with ground-floor chambers at Asini (14) (the Crown Prince Tower) and Porto Cheli (64)

Agios Athanasios (67) (Classical or 4th-century BC (Penttinen 1996a, 251)), as well as the tower at Gymnon (26) (5th- or 4th-century BC (Simpson 1981, 25; Πίκουλας 1995, 227)) bridge the Classical and Hellenistic periods, while the towers at Agios Sostis (probably 4th-century BC (Wiseman 1978, 116; Cloke 2016, 910)) and Kophy Rachi (42) (Late Classical or Hellenistic (Penttinen 2005, 112)) are either Late Classical or Hellenistic. Seven further sites probably belong to the Hellenistic period: Iria (31) (late 4th- and 3rd-century BC (Schilbach 1976, 128)), Lampagiana (45) (Jameson et al. 1994, 507–8), Stavropodio (75) (Αρχοντίδου-Αργύρη 1975, 77; Touchais 1977, 554), Vigliza (85) (Penttinen 1996a, 270), Marmaralono Agiou Petrou (102) (Φάκλαρης 1990, 128; Shipley 1996, 280) and Nea Epidavros: Palatia (121) (Αρχοντίδου-Αργύρη 1977a, 49). In addition, the historic walls at Mykinai (51) were built during the resettlement of the site in the 3rd century BC (Wace et al. 1923, 417; Schilbach 1975, 101; French 2002, 147; Iakovides and French 2003, 27). Only at Kastro 1 (36) the surface pottery suggests a Geometric date (Jameson et al. 1994, 442).

[306] Lawrence 1979; Meißner 2005, 300–8; De Souza 2007, 450–60; Strauss 2007, 241–2; Jansen 2016, 103.

[307] For developments in fortifications, see for example Winter 1971, 101–1. 305; Garlan 1974, 244–69; Lawrence 1979, 42. 419; Kern 1999, 95–6; Strauss 2007, 239. For siege technologies (especially their origin in the Near East), see Lawrence 1979, 41–2; Strauss 2007, 239; Jansen 2016, 102–3.

[308] See for example Frederiksen 2011, 68.

[309] Maher 2012, 161; 2017a, 222–3. For the date of the walls of Mantineia, see Maher 2012, 170–1; 2017a, 228–9.

(towers 12, 13 and 16), which have no parallels before the 4th century BC.[310] Moving into the Hellenistic period, the fortifications at Plaka Leonidiou (63) in the Kynouria (**figure 22**) and at Sporitza (74) in the northwestern Argolid (**figure 23**) are very similar in plan to Alea (**figure 24**), New Halos (**figure 25**), Stymphalos (**figure 26**) and Kyrrhos in Syria (**figure 27**),[311] suggesting a late 4th- or early 3rd-century BC date. Three towers with integrated posterns at Elliniko Astrous (21), Ierakas (28) and Troizina (80) also belong to the Hellenistic period.[312] Comparisons to fortified sites elsewhere thus provide an approximate construction date (or at least a *terminus post quem*) for seven fortifications or building phases in the Argolid. To this group, we can add the round towers of Kazarma (39) and Kastraki (35), which are not firmly bonded with the adjoining curtain walls — a construction technique that is probably connected to the rise of mechanised siege-craft[313] and thus suggests a *terminus post quem* in the late 5th century BC.[314]

A particularly important — and controversial — "chronological marker" in Greek fortification studies are constructions connected to artillery.[315] One group of structures

[310] For the development of towers or bastions with ground-floor chambers, see Winter 1971, 162; Lawrence 1979, 223; McAllister 2005, 21, for the "Crown Prince Tower" at Asini (14), see Schilbach 1975, 93 and for the towers at Porto Cheli (64), see McAllister 2005, 30–1.

[311] Alea: probably 4th century BC (Maher 2012, 128–32; 2017a, 108–119), Kyrrhos: late 4th or early 3rd century BC (Abdul Massih and Gelin 2016, 207), New Halos: late 4th or early 3rd century BC (Reinders 1988, 170), Stymphalos: 4th century BC, with late 4th- or early 3rd-century BC modifications (Williams and Schaus 1997, 66; Williams and Gourley 2005, 232–3. 249–50; Maher 2012, 238–9; 2017a, 334–44).

[312] On towers with integrated posterns, see Winter 1971, 240; Maher 2012, 166; 2017a, 53. Other examples can be found at Paestum (Winter 1971, 245), Iasos (Winter 1971, 245) and Antikythera (Brillowski et al. 2013, 10–21). For the postern at Elliniko Astrous (21), see Goester 1993, 79, for the *diateichisma* at Troizina (80), see Fouquet 2015, 124, and for the inner circuit at Ierakas (28), see Wace and Hasluck 1908, 172–3.

[313] Ph. *Pol.* 84.18–23. Winter 1971, 167; Schilbach 1975, 97.

[314] Schilbach 1975, 97. 109.

[315] The first catapult (the handheld arrow-shooting *gastraphetes*) was probably invented around 399 BC in Syracuse (D. S. 14.42.1), followed by the stone-throwing *gastraphetes* in the first half of the 4th century BC (Marsden 1969, 13–4. 43. 48–56; Campbell 2011, 678–680). Schneider 1912, 1306; Marsden 1969, 56–60 placed the invention of the torsion catapult before 350 BC, while Campbell 2011, 681–2 argued that the stone missiles from the so-called cenotaph of Nikokreon at Salamis (around 311 BC) and the Athenian inventories of the year 306/5 BC (*IG*^{2} II 1487) are the first evidence for torsion artillery. By the second half of the 4th century BC,

that features very prominently in disscussions of Greek artillery are "hexagonal" towers.[316] Their prominence is probably largely due to Philo of Byzantion, who recommended that "it is necessary to associate hexagonal towers as gateway-complexes, in order that the corners may be less broken (than if they were rectangular), and that falling (enemy) missiles may not all come together at the gate-passages and so shatter the gates and make them difficult to go out of, and that you may have bearings for catapults in any direction".[317]

In the light of this passage, hexagonal towers are surprisingly rare before the Roman period. Overall, only eight examples are known, of which four are located in the Argolid:[318] the Southeast Tower at the acropolis of Asini (14) (**figures 28–30**),[319] two towers at Argos (12) (one north of the Larissa and the other on the Aspis (**figures 31–32**)),[320] and a previously unidentified tower at the northeast corner of Achladokampos (1) (**figures 33–4**).[321] Outside the Argolid, hexagonal towers were recorded at Mantineia,[322] Stymphalos,[323] Miletus[324] and Samos.[325] Among these eight towers, all

artillery was employed both by individual city-states and the Macedonian kings (D. S. 17.24.7. 26.74. 45.2. Marsden 1969, 56–7. 60–1).

[316] For example in Marsden 1969, 148; Winter 1971, 194–200. 229.

[317] Ph. *Pol.* 79.21–26.

[318] A further tower with angled corners was recorded at Thisbe in Boiotia (Maier 1958, 20–3; Garlan 1974, 332; Lawrence 1979, 387), but it differs considerably from the towers in the Argolid and will therefore not be included in this study.

[319] Frödin 1938, 27–8; Winter 1971, 196; Garlan 1974, 332; Lawrence 1979, 387; Adam 1982, 58.

[320] Vollgraff 1907, 152; Maier 1959, 145–6; Garlan 1974, 332; Lawrence 1979, 387; Adam 1982, 58; Philippa-Touchais and Touchais 2010, 558. The tower on the Aspis is known as "Tower Y".

[321] Curtius 1852, plate 15 shows a circular rather than a hexagonal tower, but this is probably due to the small scale of the plan.

[322] Fougères 1898, 155–6; Maher 2012, 161; 2017a, 222.

[323] Williams and Schaus 1997, 66; Maher 2017a, 337.

[324] Gerkan 1935, 46–7; Garlan 1974, 332; Lawrence 1979, 387; Adam 1982, 58.

[325] Tölle 1969, 44; Garlan 1974, 332; Kienast and Homann-Wedeking 1978, 14–5. 83–4. 94–7; Lawrence 1979, 387; Adam 1982, 58.

datable examples (Asini (14), Mantineia, Stymphalos and Samos)[326] belong to the 4th- or early 3rd-century BC.

How far can these hexagonal towers serve as "chronological markers" for fortifications in the Argolid? Given the towers' construction dates (if known) and their geographical focus on the Peloponnese, it is unclear if Philo's late 3rd-century BC *Poliorketika* provides an appropriate interpretive framework.[327] But even leaving aside this issue and looking instead at the quoted passage in detail, it quickly becomes apparent that Philo's three arguments for constructing hexagonal towers are not universally applicable to the surviving examples. Firstly, Philo highlights the absence of vulnerable corners — a consideration that may have been important at Achladokampos (1), Asini (14), Mantineia, Miletus and Samos,[328] but not to the same extent at the naturally defensible sites of Argos (12) and Stymphalos.[329] Secondly, Philo's argument that hexagonal towers hinder artillery attacks at gateways[330] is only relevant at Samos.[331]

This leaves only Philo's third argument — "that you may have bearings for catapults in any direction".[332] Many scholars have noted that ancient artillery on

[326] Asini (14): ca. 300 BC (see above); Mantineia: 4th century BC (Maher 2012, 170; 2017a, 228–9); Stymphalos: late 4th or early 3rd century BC (Williams and Schaus 1997, 66; Maher 2017a, 343–4); Samos: 310–290 BC (Kienast and Homann-Wedeking 1978, 96–7).
[327] This work was probably written in the late 3rd century BC (Whitehead 2016, 22) in the context of the Ptolemaic-Seleucid wars in the eastern Mediterranean (Lawrence 1979, 70–1; Whitehead 2016, 24. 33).
[328] These towers face even ground or gentle slopes and are thus easily accessible.
[329] The slope of the Aspis (and possibly also the Larissa) would have protected the fortification from attacks with rams (although artillery fire may have been possible), while the tower at Stymphalos was inaccessible from below and probably out or reach of stone-throwing catapults.
[330] For τοὺς δὲ κατὰ τοὺς πυλεῶνας ἑξαγώνους δεῖ συντελεῖν Lawrence 1979, 75 suggested a translation as "it is necessary to associate (a pair of) hexagonal towers as gateway-complexes", but the Greek does not specify that hexagonal towers should be constructed in pairs. In fact, flanking an entrance with two hexagonal towers would expose the gate to fire from a wider angle.
[331] At Asini (14), tower and gate are too far apart, at Mantineia only missiles fired from a very narrow angle posed a danger to the gate and at Miletus the gate is placed at right angle to the city walls.
[332] The translation of τάς τε ἐπιτάσεις τῶν βελῶν ἔχῃς πανταχόθεν is difficult. Firstly, Philo used the term τὸ βέλος both for missiles and for catapults (e.g. Ph. *Bel*. 55.19. 91.2). Secondly, the meaning of ἐπίτασις (literally "stretching") is unclear. In the context of artillery, the term is used for the stretching of a bowstring (Bito 46.2. 46. 7. 51.2) or for fibre-made springs (App. *Pun*. 93).

hexagonal towers could theoretically cover a particularly large arc of fire,[333] but the feasibility of placing torsion catapults at the eight surviving examples has never been systematically investigated. Although no ancient torsion catapult survives complete, we can estimate the original size of two types of catapults — stone-throwing palintones and arrow-shooting euthyones — on the basis of literary sources,[334] surviving missiles[335] and metal fittings, especially the washers that reinforced the holes for the torsion springs (**tables 7–8**).[336] Assuming that the upper walls or parapets of the hexagonal towers were comparable in width to contemporary fortified structures elsewhere (**tables 9–10**)[337] and that at least 1 m was necessary behind a catapult's stock for the handspike and operators, arrow-shooting euthyones could have been fitted at all eight hexagonal towers (**table 11**).

Perhaps here it should be understood as "the drawing of the bowstring", which would imply aiming a catapult.

[333] For example, Marsden 1969, 147–8; Winter 1971, 195–6.

[334] Ph. *Bel*. 51.15–25. 53.15–20. 54.25–55.2; Vitr. 10.5–10.

[335] Ph. *Bel*. 51. 21–7; Ph. *Pol*. 99.17 lists missiles of 2, 10, 15, 20, 30 and 50 minai, as well as 1, 2 1/2 and 3 talents (Campbell 2011, 685). The stone missiles found at Rhodes, Pergamon, Tel Dor, Salamis and Carthage differ slightly in calibre, but weigh roughly 3, 5, 8, 10, 12, 15, 18, 20, 22, 25, 30, 37.5, 40, 50, 65, 70, 80 and 100 minai, as well as 1, 1 1/2, 2, 2 1/2 and 3 talents (Campbell 2003, 20–22, 2011, 685; Nossov 2005, 137–8). In addition, stone missiles of 6–7 minai were found at Pergamon (Szalay 1937, 50).

[336] The basic unit for calculating the dimensions of ancient torsion catapults is the diameter of the torsion spring. Based on Ph. *Bel*. 51.15–25. 53.15–20. 54.25–55.2 and Vitr. 10.5–10, Marsden 1969, 36; Baatz 1982, 224 estimated that a stone-throwing palintone measured ca. 30 diameters in length, while an arrow-shooting euthyone was ca. 25 diameters long. These formulae were widely adopted (see for example Ober 1987, 600–1, 1992, 150; Campbell 2003, 14; Nossov 2005, 281), but as Rihll 2006, 380–3 has pointed out, it remains unclear how E.W. Marsden and D. Baatz reached their conclusions. Strictly speaking, it is only possible to estimate the length of the stock (16 diameters for arrow-shooting euthyones and 19 diameters for stone-throwing palintones) and the width (14 diameters for arrow-shooting euthyones and 12 diameters for stone-throwing palintones) of ancient torsion catapults. These figures are summarised in **tables 7–8,** based on the known calibres of ancient missiles and on surviving spring-hole washers from Ephyra (2nd century BC, Baatz 1979, 1982) and from the 1st-century BC Mahdia shipwreck (Baatz 1985).

[337] No hexagonal tower survives to its full height, so that the original width of the mudbrick or stone walls, crenellations or battlements has to be estimated with the help of better-preserved parallels. For mudbrick walls, see the walls of Demetrias (1.35–2.15 m wide (Stählin 1934, 84–90)), for stone walls see the so-called "artillery towers" in Attica, Boiotia, at Messene and in Asia Minor (0.4–1.42 m wide (Ober 1987, 1992)), for crenellated stone battlements, see Kaunus and Herakleia ad Latmos (0.5 m wide (Lawrence 1979, 361. 370)) and for continuous stone battlements, see Aetolian Chalkis, Perga and Herakleia ad Latmos (0.53–0.8 m wide (Lawrence 1979, 368. 370–1)).

In addition, the towers at Argos (12), Asini (14), Miletus and Samos could have housed stone-throwing palintones (**table 11**).

Consequently, the hexagonal towers in the Argolid and beyond could have been constructed to enable a larger arc of artillery fire, but alternative explanations for their unusual shape are also possible. For example, on the sloping terrain of the Aspis and the Larissa the hexagonal shape may have been chosen for static reasons. It is therefore the limited chronological range of the dated example (4th – early 3rd century BC) rather than any certain connection to torsion catapults that makes the hexagonal towers a "chronological marker" in the study of fortifications in the Argolid.

Nevertheless, there remains one group of architectural features connected to Greek catapults: artillery batteries, which are usually large bastions constructed with particular care to withstand the recoil of catapults.[338] In the Argolid, there are two possible examples: the rectangular bastion at the highest point of Plaka Leonidiou (63) (**figure 22**), which mirrors the artillery batteries at Alea, New Halos and Stymphalos (**figure 24–6**),[339] and the semi-circular bastion at the northern end of the elaborate triangular bastion on Argos' Aspis hill (12) (**figure 35**).[340] Despite its smaller size, this bastion is, for example, comparable to the battery at the North Gate at Selinous (probably around 300 BC (**figure 36**))[341] and therefore tentatively supports the late 4th- or early 3rd-century BC date suggested by the stratified finds.

[338] Winter 1971, 177–88; Lawrence 1979, 395–8. For example, the walls of the artillery bastions at Stymphalos have a width of 3 m (Williams and Gourley 2005, 246; Maher 2012, 231–2; 2017a, 337).
[339] Alea: 23.3 by 8 m (Lawrence 1979, 396), Stymphalos: 21 by 11 m (Williams and Gourley 2005, 246; Maher 2012, 231; 2017a, 337).
[340] Vollgraff 1907, 150–2; Philippa-Touchais and Touchais 2010, 559; Fachard and Bessac (forthcoming).
[341] Winter 1971, 181; Mertens et al. 1989, 113–4. 129–31; Karlsson 1992, 59.

4.5 Polygonal problems: dating by masonry style

Moving on from "chronological markers" in defensive architecture, masonry chronologies are both the most widely used and the most controversial technique of dating Greek fortifications. Many previous studies are based on the masonry typology set out by R. Scranton in 1941,[342] but over the last decades it has become increasingly clear that this chronological model falls short of reality.[343] Since different masonry styles may be a response to particular local circumstances (e.g. the available financial resources or the grain of the local stone) as well as the result of aesthetic preferences and military technology,[344] the next part of this chapter will focus on developing a regional masonry typology, which can serve as a new chronological framework for the diverse masonry styles at the fortifications in the Argolid.

Overall, the masonry styles in this study can be divided into the three broad categories: drystone (**figure 37**),[345] roughly hewn masonry (**figures 38–39**) and carefully fitted masonry (**figures 40–45**).[346] The second and third category can further be subdivided according to the shape of the individual blocks into seven subgroups (ashlar (**figure 40**), coursed trapezoidal (**figure 41**), uncoursed trapezoidal (**figure 42**), coursed polygonal (**figures 38 and 43**), and uncoursed polygonal masonry (**figures 39 and 44**), as well as trapezoidal or polygonal walls that cannot be attributed to any of the more specific subgroups).[347] We can further distinguish between walls with rough or

[342] Scranton 1941.
[343] Lawrence 1979, 245; Frederiksen 2011, 63–65; Fachard 2012, 257–260; Maher 2012, 77; 2017a, 41–3.
[344] Lawrence 1979, 234–5; McNicoll 1997, 3; Fachard 2012, 257–8; Maher 2012, 77–8; Bessac 2016, 132–4; Brasse and Müth 2016, 90–9; Maher 2017a, 43.
[345] In this type of masonry, individual blocks show no or only very few signs of shaping.
[346] The walls of the third group consist either of similarly sized blocks or include small triangular stones to fill in the corners between large blocks. Today, these stones are sometimes missing, rendering the masonry similar in appearance to the walls of the second group.
[347] Both coursed and uncoursed polygonal masonry can include levelling courses and rectangular corner stones.

deliberately irregular faces (**figures 38–39, 41–43 and 29**) and walls with smooth or regularly patterned surfaces (**figures 40 and 44**).

Although this new classification is specifically tailored to masonry in the Argolid, some overlap between the different categories remains. For example, polygonal and trapezoidal blocks can be present in the same fortification. Such combinations of different masonry styles are described in detail in the site catalogue, but for the purpose of this chapter we will distinguish between two different scenarios. If, on the one hand, a site includes clearly defined sections in different masonry styles, the different styles are classified individually,[348] but if, on the other hand, different types of masonry are present within the same structure and building phase, the masonry will be classified according to the predominant style.

Among the 146 fortifications in the Argolid, 102 are sufficiently preserved and documented to analyse the masonry.[349] At 18 sites, multiple masonry styles are present at the same fortification, raising the total number of individual "samples" to 135.[350] The distribution of different masonry styles is summarised in **figure 46**. 26 walls were built

[348] One example is the site of Kophy Rachi (42), which includes a tower in roughly hewn polygonal masonry, as well as a circuit in drystone masonry.

[349] The 45 sites where the masonry cannot be classified adequately are Tiryntha (76), Agios Leonidas (89), Ermioni: Magoula (93), Kapsala (96), Marmaralono Agiou Petrou (102), Perasphalktra (103), Xydeika (106), Agia Paraskevi (107), Andritsa: Elliniko (109), Andritsa: Koukouras (110), Chora (111), Dervenakia (112), Ellinon Lithari (113), Kato Phanari (114), Katsigiari (115), Koroni (116), Krya Vrysi: Misorrachi (117), Metochi (118), Moni Panagias Agnountos (119), Nea Epidavros: Brinia (120), Nea Epidavros: Palatia (121), Papoutsaiika (122), Pigadaki (123), Stena (124), Strongylo (125), Zavitsa (126), Agios Dimitrios (128), Agios Ioannis (129), Dalamanara (131), Dimaina (132), Kodeles (133), Korakia (134), Mathi (135), Monastiraki (136), Myloi: Kalamaki (137), Petrothalassa (138), Petrothalassa: Kypraiou (139), Prosymna: SM 8 (141), Skala 2 (142), Porto Ydra (140), Spathovouni (143), Ververonta (144), Zogka: Asprorrema (145) and Zogka: Sykitsa (146). Most of these sites no longer survive or could not be located.

[350] Eleven sites combine two different masonry styles (Agios Adrianos (3), Andritsa: Goulas (9), Benteni Kiapha (16), Nafplio (52), Kleonai (41), Kophy Rachi (42), Palaia Epidavros 1 (54), Phourkaria (61), Poulithra (65), Troizina (80) and Tsiorovos Dolianon (82)), four sites three masonry styles (Agios Andreas (4), Ierakas (28), Mykinai (51) and Porto Cheli (64)), two sites four masonry styles (Elliniko Astrous (21) and Ermioni (24)), one site (Argos (12)) five masonry styles and one site (Asini (14)) six masonry styles.

in drystone masonry (19.3% of all examples),[351] 39 in roughly hewn masonry (28.9%)[352] and 70 in carefully fitted masonry (51.8%).[353] Of the 39 roughly hewn walls, one is constructed in ashlar (2.6% of the roughly hewn walls),[354] one in coursed trapezoidal (2.6%),[355] one in uncoursed trapezoidal (2.6%),[356] 15 in coursed polygonal (38.5%),[357] seven in uncoursed polygonal (18%)[358] and 15 in polygonal of uncertain structure (35.9%) (**figure 47**).[359] In comparison, the 70 carefully fitted examples include five walls

[351] Agio Lias (2), Anathema (8), Argos (12), Asini (14), Asini: Barbouna (15), Kantia 1 (33), Kastro 1 (36), Kastro 2 (37), Kastro tis Paliopanagias (38), Kleonai (41), Kophy Rachi (42), Phranchthi (62), Prosilia (66), Soros (72), Stavropodio (75), Tsiorovos Dolianon (82), Vigla (84), Vigliza (85), Vourlia 1 (86), Akrotiri Iria 1 (90), Akrotiri Iria 2 (91), Alogomandra Kalogirou (92), Drymoni 2 (94), Skala 1 (104) and Aitolithi (130).

[352] Agios Sostis (5), Amygdalitsa (7), Argos (12), Asini (14), Benteni Kiapha (16), Drymoni 1 (20), Elliniko Astrous (21), Elliniko: Ellinikaki (22), Ermioni (24), Galatas: Megali Magoula (25), Gyphtokastro (27), Ierakas (28) (two samples), Kastraki (35), Kephalovryso (40), Kophy Rachi (42), Kyparissi (44), Lileika Xeropigadou (47), Limanaki 1 (48), Mykinai (51), Paralio Astros (56), Phourkaria (61), Plaka Leonidiou (63), Poulithra (65) (two samples), Prosymna: Agios Athanasios (67), Prosymna: Agios Dimitrios (68), Spathokommeno (73), Sporitza (74), Tourkovrysi (78), Tourniki: Gaidourovouni (79), Troizina (80), Tyros (83), Xylopyrgo (88), Vourlia 2 (87), Karya (97), Kondyli (98), Malantrenion (101) and Tourniki: Agios Nikolaos sta Ampelia (105).

[353] Achladokampos (1), Agios Adrianos (3) (two samples), Agios Andreas (4) (three samples), Akova: Varda (6), Andritsa: Goulas (9) (two samples), Ano Phanari (10), Ano Phanari: Vigliza (11), Argos (12) (two samples), Aria (13), Asini (14) (four samples), Benteni Kiapha (16), Charadros (17), Choutalaiika (18), Douka Vrysi (19), Elliniko Astrous (21) (three samples), Elliniko: Kephalari (23), Ermioni (24) (three samples), Gymnon (26), Ierakas (28), Iliokastro (29), Iliopoulaiika (30), Iria (31), Kampia (32), Kantia 2 (34), Kazarma (39), Kleonai (41), Krya Vrysi: Marmarakia (43), Lampagiana (45), Levkakia (46), Lygourio 1 (49), Lyrkeia (50), Mykinai (51) (two samples), Nafplio (52) (two samples), Nera (53), Palaia Epidavros 1 (54) (two samples), Phichtia: Kokkinia (57), Phichtia: Limiko (58), Phichtia: Paliopyrgos (59), Phichtia: Stathmos (60), Phourkaria (61), Porto Cheli (64) (three samples), Prosymna: Pyrgouthi (69), Pyrgiotika (70), Pyrgouli (71), Tou Antreiomenou to Mnema 1 (77), Troizina (80), Tserpho Tyrou (81), Tsiorovos Dolianon (82), Kalkani (95), Limanaki 2 (99), Lygourio 2 (100), Akova: Chouni (108) and Zogka: Pyrgos (127).

[354] Drymoni 1 (20).

[355] Prosymna: Agios Athanasios (67).

[356] Poulithra (65).

[357] Agios Sostis, Argos (12), Ermioni (24), Galatas: Megali Magoula (25), Ierakas (28), Kophy Rachi (42), Kyparissi (44), Mykinai (51), Plaka Leonidiou (63), Poulithra (65), Tourniki: Gaidourovouni (79), Troizina (80), Vourlia 2 (87), Xylopyrgo (88) and Tourniki: Agios Nikolaos sta Ampelia (105).

[358] Asini (14), Benteni Kiapha (16), Gyphtokastro (27), Ierakas (28), Kastraki (35), Paralio Astros (56) and Tyros (83).

[359] Amygdalitsa (7), Elliniko Astrous (21), Elliniko: Ellinikaki (22), Kephalovryso (40), Lileika Xeropigadou (47), Limanaki 1 (48), Phourkaria (61), Prosymna: Agios Dimitrios (68), Spathokommeno (73), Tourkovrysi (78), Sporitza (74), Karya (97), Kondyli (98) and Malantrenion (101).

in ashlar (8.6% of the carefully fitted walls),[360] eleven in coursed trapezoidal (15.7%),[361] three in uncoursed trapezoidal (4.3%),[362] 27 in coursed polygonal (38.6%),[363] 15 in uncoursed polygonal (21.4%),[364] one in trapezoidal (1.4%)[365] and seven in polygonal masonry (10%) (**figure 48**).[366] All five examples with smoothed surfaces are built in carefully fitted blocks (two in ashlar, one in coursed trapezoidal and two in coursed polygonal masonry).[367]

Unfortunately, not all features in this typology are primarily determined by a site's construction date. Although the different masonry styles do not follow a strict regional pattern (**figures 49–50**), there appears to be some correlation between the choice of masonry and the local building stone. For example, the limestone around Palaia Epidavros is hard, fine-grained and usually employed in carefully fitted masonry (**figure 44**), whereas the limestone around the bay of Poulithra (darker in colour than the limestone at Palaia Epidavros and often crossed by fine cracks) is usually cut into roughly hewn blocks (**figure 51**). Using the appearance of the joints between individual blocks to date a site may therefore be misleading.

[360] Andritsa: Goulas (9), Argos (12), Asini (14), Kleonai (41) and Porto Cheli (64). Ashlar walls are also present at Agios Andreas (4), but probably belong to a later phase of reuse.
[361] Asini (14), Choutalaiika (18), Elliniko Astrous , Ermioni (24), Gymnon (26), Iliokastro (29), Phourkaria (61), Porto Cheli (64) (two examples), Troizina (80) and Tsiorovos Dolianon (82).
[362] Ano Phanari (10), Ermioni (24) and Palaia Epidavros 1 (54).
[363] Achladokampos (1), Agios Adrianos (3), Agios Andreas (4), Andritsa: Goulas (9), Ano Phanari: Vigliza (11), Argos (12), Aria (13), Asini (14), Charadros (17), Douka Vrysi (19), Elliniko Astrous (21), Elliniko: Kephalari (23), Ierakas (28), Iliopoulaiika (30), Iria (31), Kampia (32), Kantia 2 (34), Kazarma (39), Krya Vrysi: Marmarakia (43), Lyrkeia (50), Mykinai (51), Nafplio (52), Phichtia: Paliopyrgos (59), Prosymna: Pyrgouthi (69), Pyrgouli (71), Tserpho Tyrou (81) and Akova: Chouni (108).
[364] Agios Adrianos (3), Agios Andreas (4), Akova: Varda (6), Asini (14), Benteni Kiapha (16), Elliniko Astrous (21), Ermioni (24), Lampagiana (45), Levkakia (46), Mykinai (51), Nafplio (52), Palaia Epidavros 1 (54), Phichtia: Limiko (58), Phichtia: Stathmos (60) and Lygourio 2 (100).
[365] Tou Antreiomenou tou Mnema (77).
[366] Lygourio 1 (49), Nera (53), Phichtia: Kokkinia (57), Pyrgiotika (70), Kalkani (95), Limanaki 2 (99) and Zogka: Pyrgos (127).
[367] Ashlar: Asini (14) and Kleonai (41). Coursed trapezoidal: Porto Cheli (64). Coursed polygonal: Argos (12) and Elliniko Astrous (21).

Furthermore, there may be a correlation between a site's layout and its masonry style. Most fortifications in the Argolid follow a predominantly angular layout, with the exception of 15 structures that are circular in shape or include circular towers. Compared to the overall distribution pattern, these structures include an unusually high proportion of roughly hewn masonry (**figures 52–3**).[368] Although the size of this sample is admittedly very small, this tentatively suggests that roughly hewn blocks were more commonly used for circular sturctures.

In addition, the different types of masonry are not equally distributed among the four types of fortifications. As **figures 54–6** show, drystone walls include an unusually high number of forts, while towers are more commonly constructed in carefully shaped or roughly hewn blocks. This pattern may partly be due to the preservation, identification and recording of possible drystone towers — easily mistaken for more recent structures — but nevertheless the scarcity of carefully fitted walls among the forts casts doubt on whether the distinction between drystone, roughly hewn and carefully fitted walls is chronologically significant.

Turning to the shape of the individual blocks (ashlar, coursed polygonal, uncoursed trapezoidal etc.), only the coursed polygonal walls are numerous enough to study their distribution among different types of fortifications (fortified settelements, forts and towers). Interestingly, **figures 55-7** show that the distribution of different types of fortifications with coursed polygonal walls closely resembles the overall distribution pattern. This tentatively suggests that the shape of the individual blocks might be

[368] Drystone masonry: Prosilia (66). Roughly hewn masonry: Agios Sostis (5), Galatas: Megali Magoula (25), Kastraki (35), Limanaki 1 (48), Phourkaria (61) and Xylopyrgo (88). Carefully fitted masonry: Andritsa: Goulas (9), Choutalaiika (18), Elliniko Astrous (21), Ermioni (24), Ierakas (28), Kazarma (39), Nera (53) and Porto Cheli (64).

independent of a fortification's type and may perhaps follow a chronological development.

Of the 135 "samples" of masonry included in the study, 36 can be dated through written sources, stratified material, surface finds or particular architectural features (26.7 % of all examples). The earliest datable walls — the drystone circuits at Asini (14–5) — were built in the last quarter of the 8th century BC. Drystone masonry continued to be used into the Classical and Hellenistic period (for examples at Kophy Rachi (42), Palaia Epidavros 2 (55), Phranchthi (62) and Soros (72)) and thus does not necessarily indicate a Geometric or Archaic construction date. Nevertheless, it is worth noting that securely dated fortification walls in shaped blocks are absent in the Argolid until the 5th century BC.[369]

Moving on to walls constructed in shaped blocks, ashlar masonry was used at the lower town at Asini (14) (5th–4th century BC)[370] and at Porto Cheli (64) (before the end of the 4th century BC).[371] The date of these examples tentatively suggests that ashlar masonry had gone out of use for fortifications in the Argolid by ca. 300 BC. Datable walls in coursed trapezoidal masonry with smoothed surfaces also seem to belong to the Classical period,[372] while trapezoidal masonry with rough surfaces was used both in Classical and Hellenistic times.[373] The earliest datable example of polygonal masonry in the region are the late 5th-century BC coursed polygonal walls at Lygourio 1 (49) and Elliniko: Kephalari (23), while Iria (31) and Asini (14) demonstrate that this masonry style continued to be used at least until the 3rd century BC. In contrast, uncoursed

[369] This casts doubt on the Archaic date that was previously proposed for several polygonal walls on Argos' Larissa (for example by Frederiksen 2011, 130–1).
[370] Πιτερός 1996a, 90. See above.
[371] McAllister 2005, 76–84.
[372] The only datable example of this masonry style is found at Porto Cheli (64).
[373] Classical: Iliokastro (29). Hellenistic: Asini (14) and Troizina (80) (*diateichisma*). No examples of uncoursed trapezoidal masonry in the Argolid could so far be assigned to a specific period.

polygonal masonry is not attested in the region prior to the 3rd century BC and thus seems to be a primarily Hellenistic phenomenon.[374]

4.6 Dating ancient fortifications: discussion and conclusions

This new (even if rather sketchy) regional masonry chronology allows us to assign an approximate construction date to 60 further walls in the Argolid. Three of these walls date to the Classical period,[375] 40 to the period following the late 5th century BC,[376] 13 to ca. 300 BC at the earliest[377] and four to the Classical or Hellenistic period[378] (**figure 58**). These results raise the number of broadly datable fortifications in the region to 95 out of 146 sites.[379]

Most of these 95 fortified sites were constructed after the late 5th-century BC and only five fortifications include historical building phases that clearly predate the Late Classical period.[380] At least in the Argolid, rural fortifications thus appear to be a predominantly Late Classical and Hellenistic phenomenon.

But even with this new regional chronological framework, several issues remain. Firstly, most sites can only be dated through a single type of evidence, which highlights

[374] The datable examples are Mykinai (51) (3rd century BC) and Asini (14) (ca. 300 BC).
[375] Kleonai (41), Spathovouni (143) and Ververonta (144).
[376] Amygdalitsa (7), Andritsa: Goulas (9), Ano Phanari: Vigliza (11), Aria (13), Charadros (17), Douka Vrysi (19), Elliniko: Ellinikaki (22), Iliopoulaiika (30), Kampia (32), Kantia 2 (34), Kephalovryso (40), Krya Vrysi: Marmarakia (43), Kyparissi (44), Lileika Xeropigadou (47), Limanaki 1 (48), Lyrkeia (50), Nera (53), Phichtia: Kokkinia (57), Phichtia: Paliopyrgos (59), Phourkaria (61), Poulithra (65), Prosymna: Agios Dimitrios (68), Pyrgiotika (70), Pyrgouli (71), Spathokommeno (73), Tourkovrysi (78), Tourniki: Gaidourovouni (79), Tserpho Tyrou (81), Vourlia 2 (87), Xylopyrgo (88), Kalkani (95), Karya (97), Kondyi (98), Limanaki 2 (99), Malantrenion (101), Tourniki: Agios Nikolaos sta Ampelia (105), Xydeika (106), Akova: Chouni (108), Kato Phanari (114) and Myloi: Kalamaki (137).
[377] Agios Adrianos (3), Agios Andreas (4), Akova: Varda (6), Benteni Kiapha (16), Ermioni (24), Gyphtokastro (27), Levkakia (46), Nafplio (52), Palaia Epidavros 1 (54), Paralio Astros (56), Phichtia: Limiko (58), Phichtia: Stathmos (60) and Lygourio 2 (100).
[378] Choutalaiika (18), Gymnon (26), Tou Antreiomenou to Mnema 1 (77) and Tsiorovos Dolianon (82).
[379] In addition, Marchand 2002, 311–2 has convincingly argued that the tower at Drymoni 1 (20) was built no later than the Hellenistic period.
[380] Argos (12), Asini (14), Asini: Barbouna (15), Kastro 1 (36) and Porto Cheli (64).

the need for further fieldwork at rural fortifications in the region, especially excavations and the systematic study of surfaces finds.

Secondly, even when all five types of dating evidence (written sources, stratigraphic finds, surface material, fortified architecture and masonry styles) are combined, most construction dates are not particularly precise. In many cases, it is merely possible to distinguish between Late Classical or Hellenistic fortifications on the one hand, and fortified structures constructed after 300 BC on the other hand. Consequently, it remains difficult to establish which fortified sites in the region are contemporary and connections to specific historical events remain largely elusive.

Thirdly, we are left with a corpus of 51 undatable fortifications. For 21 of these sites, surface finds at least indicate one or several periods of use during the Late Classical or Hellenistic period,[381] but for the remaining 30 sites the chronology remains entirely obscure.[382] However, this may not be as problematic as it might appear at first glance, since 24 out of the 30 undatable sites no longer survive[383] or could not be located.[384]

[381] Classical: Kastro 2 (37) (Rupp 1976, 264; Tausend 2006, 29) and Kapsala (96) (Iakovides and French 2003, 41). Hellenistic: Kantia 1 (33) (Gebauer 1939, 288–92; Brommer 1975, 172; Πιτερός 1995a, 111; Simpson and Hagel 2006, 40), Nea Epidavros: Palatia (121) (Αρχοντίδου-Αργύρη 1977a, 49) and Skala 2 (142) (Pritchett 1980, 15; Πίκουλας 1995, 189). Classical and Hellenistic: Agio Lias (2) (Wace et al. 1923, 433; Brommer 1975, 170; Wells et al. 1990, 228; Πίκουλας 1995, 187; Hahn 1996, 349–51), Ano Phanari (10) (Φαράκλας 1972a, E. 3.9), Kastro tis Paliopanagias (38) (Waterhouse and Simpson 1961, 135; Παπαχατζής 1976, 417; Φάκλαρης 1990, 155; Shipley 1996, 281), Tyros (83) (Φάκλαρης 1990, 144; Shipley 1996, 281), Vigla (84) (Simpson 1981, 31; Jameson et al. 1994, 510), Vourlia 1 (86) (Κύρου 1990, 85. 222; Suto 1995, 11), Agios Leonidas (89) (Φαράκλας 1972a, E. 3.3), Ermioni: Magoula (93) (Jameson et al. 1994, 502), Drymoni 2 (94) (Marchand 2002b, 325), Katsigiari (115) (Jameson et al. 1994, 501), Koroni (116) (Φαράκλας 1972a, E. 3.5), Metochi (118) (Jameson et al. 1994, 431), Pigadaki (123) (Φαράκλας 1972a, E. 3.2), Dimaina (132) (Φαράκλας 1972a, E. 3.3), Korakia (134) (Jameson et al. 1994, 451) and Petrothalassa (138) (Jameson et al. 1994, 483–4).

[382] Drystone circuits account for an unusually high percentage of undatable sites. Overall they make up a mere 8.2% of all fortifications in ther Argolid, but 16.7% of all undated sites.

[383] Agios Dimitrios (128), Agios Ioannis (129), Aitolithi (130), Kodeles (133), Mathi (135), Monastiraki (136), Porto Ydra (140), Prosymna: SM 8 (141), Zogka: Asprorrema (145) and Zogka: Sykitsa (146).

[384] Agia Paraskevi (107), Andritsa: Elliniko (109), Andritsa: Koukouras (110), Chora (111), Dervenakia (112), Ellinon Lithari (113), Krya Vrysi: Misorrachi (117), Moni Panagias Agnountos (119), Nea Epidavros: Brinia (120), Papoutsaiika (122), Stena (124), Strongylo (125), Zavitsa (126) and Zogka: Pyrgos (127).

Regardless of their date, these sites have therefore only a limited potential, especially in a study that very much focuses on the location of the individual fortifications within the ancient landscape.

In view of the considerations outlined in this chapter, the fortifications in the Argolid now present a very different picture. Instead of being limited to a handful of datable sites, the present study can draw on a collection of 88 fortifications and possible fortifications that are both securely located and roughly dated, as well as a collection of undated sites that were in use during the Late Classical or Hellenistic period. Like any corpus of archaeological material, this collection is very fragmentary, but it nevertheless provides a sufficient basis for the regional analyses we will turn to in the remaining chapters.

CHAPTER 5: A REGIONAL STUDY OF FORTIFICATIONS IN THE ARGOLID

5.1 The political geography of the Argolid (400 — 146 BC)

272 BC was a turbulent year for Argos, as the city became embroiled in the struggle between Antigonos Gonatas and Pyrrhus of Epeiros, culminating in Pyrrhus' attack on the city. But when the gates of Argos were found to be too small to admit Pyrrhus' war elephants, confusion ensued and the king himself was hit by a roof tile and killed in the streets of the city.[385] Over subsequent years or even decades, visitors to the small Enyalios shrine northeast of Mycenae were able to see a striking physical reminder of these events: a bronze shield, dedicated by the Argives and carrying the inscription "τοὶ Ἀργεῖο[ι τοῖς] θεοῖς ἀπὸ β[ασιλέως] Πύρρο[υ]".[386]

Such weapon dedications are neither particularly unusual nor limited to the Hellenistic period. For example, the Argives also dedicated several shields, helmets and greaves at Olympia after a victory against Corinth in the late 6th or early 5th century BC.[387] Nor were these weapon dedications the only visual reminder in sacred or public spaces of past conflicts. A 4th-century BC visitor to the Asklepieion at Epidauros would have encountered pilgrims with shocking war wounds ("Antikrates of Knidos […] had been struck with a spear through both his eyes in some battle, and he became blind and carried around the spearhead with him, inside his face"[388]), while an Argive walking towards the city's agora around 400 BC might have passed a freshly cut limestone stele inscribed with a casualty list.[389] These few examples illustrate how past conflicts were present and visible in the everyday life of the ancient Argolid and demonstrate how across periods

[385] Plut. *Pyrrh.* 31–4.
[386] *SEG* xxiii 186 (272 BC). Μυλωνάς 1967, 95–6; Marchetti 1992, 58–9; Baitinger 2011, 75.
[387] Jackson 2000; Baitinger 2011, 80.
[388] *IG* IV². i 122, 63–6 (4th century BC). LiDonnici 1995, 108–9.
[389] *SEG* xxix 361 (ca. 400 BC). Κριτζάς 1979, 217.

the inhabitants of the region were frequently reminded of both the opportunities and the costs of war.

In contrast to these ubiquitous material reminders of ancient warfare,[390] fortifications in the Argolid are not equally distributed across different periods, but experienced a dramatic increase in the overall number of sites from ca. 400 BC onwards.[391] By this time the communities in the area known today as the "Argolid" had crystallised into the familiar city-states of Argos, Epidauros, Halieis, Hermion, Kleonai and Troizen.[392] That is not to say that from 400 BC onwards the political landscape of the region remained static: for example, the city of Kleonai was temporarily incorporated into Argos (probably between the early 4th century BC and 235 BC),[393] while Halieis was destroyed and ceased to exist as a political community in the early 3rd century BC.[394]

Locating the often shifting boundaries between these six city-states and their neighbours is crucial for understanding the Argolid's rural fortifications, not least because in many cases it is only the political division of the region that allows us to attribute a site to a specific city-state. However, we should bear in mind that the nature of ancient territorial boundaries is neither uniform nor directly comparable to modern borders. In some areas, the limits of ancient territories appear as transitional "grey-zones"

[390] The "ubiquity" of war itself is still very much a matter of debate. See for example Shipley 1993, 1–24; Chaniotis 2005, 1–17; Hall 2007, 88; Hornblower 2007, 23–39.
[391] See chapter 4.
[392] See section 1.3.
[393] Marchand 2002b, 512–3; Kralli 2017, 174. Kleonai was traditionally thought to have retained its independence into the late 4th century BC (Piérart and Thalmann 1980, 261–268; Perlman 2000, 138–152; Piérart 2004, 611), but the evidence cited for this date is problematic. For example, the name of the city in the Athenian proxeny-decree *IG* II^2 365 (323/322 BC) is heavily restored, while the late 4th-century BC date of Kleonian bronze coins is based on their archaeological find context at Nemea (Miller 1976, 192; Piérart 2004, 611) and is thus merely a *terminus ante quem*. In addition, Kleonai is already mentioned as Argive *kome* in the early 4th-century BC (Kritzas 2006, 427–429).
[394] From the mid 3rd century BC onwards, Halieis disappears from the literary, numismatic and epigraphic record (Hodkinson and Hodkinson 1981, 245; Jameson et al. 1994, 88–9. 395). Since the Epidauria bordered on Halieis in the 4th century BC (Scyl. 50.2), but on Hermion in the 2nd century BC (*IG* IV^2. i 75; *SEG* xi 377; *SEG* xi 405 (2nd century BC)), the former territory of Halieis was probably incorporated into Hermion.

or "no-man's-lands",[395] but at the same time ancient boundary disputes demonstrate that a perception of borders as clearly defined notional "lines" existed at least from the 4th century BC onwards.[396] It is therefore important to stress that the "borders" reconstructed in this study are not an attempt to impose a modern view of "borders" between clearly delineated territories on the ancient political landscape,[397] but merely a tool that helps to visualise the approximate extent of city-states without making assumptions about the nature of their boundaries.

But how can we reconstruct the Argolid's Late Classical and Hellenistic political geography? The earliest surviving geographical work that relates to this region is the 4th-century BC *Periplus Maris Interni*, erroneously attributed to Scylax of Karyanda, but this text is notoriously corrupt and difficult to interpret.[398] Consequently, the detailed descriptions in the second book of Pausanias' *Periegesis* (2nd century AD)[399] and the eighth book of Strabo's *Geographica* (1st century AD)[400] at first glance seem more promising sources. However, both describe the landscape in the 1st and 2nd centuries AD rather than in the period under investigation in this study. Major surviving historiographical works concerning the Argolid in the Late Classical and Hellenistic period usually only mention territorial boundaries in passing.

[395] For example, Penttinen 2005, 98.
[396] See, for example, Rousset, 1999, 50–4. For epigraphically attested boundary disputes, see Daverio Rocchi 1988, 93–177; Harter-Uibopuu 1998, 9–116; Dixon 2000. In the 4th century BC, a clearly delineated territorial border marked with boundary stones existed between Argos and Corinth (Xen. *Hell.* 4.4.6).
[397] Even in modern scholarship, the terms "border", "boundary" and "frontier" are not always used consistently. For three different and conflicting uses in modern theoretical approaches, see McCarthy 2008, 203–4; Diener and Hagen 2012, 4–13; Feuer 2016, 11–23. In the following study, the three terms will be used interchangeably to refer to the limit or liminal zone of ancient city-states.
[398] Shipley 2011, 1–2. 6–9.
[399] Pretzler 2007, 23.
[400] Dueck 2000, 146–151.

These difficulties make contemporary inscriptions a crucial source for reconstructing the political geography of the Argolid. Especially important are the aforementioned boundary disputes, which record arbitrations between two neighbouring city-states (usually members of the Achaian League).[401] They provide evidence for the precise nature and course of specific boundaries, but are often difficult to interpret. For example, of the 19 toponyms used to describe the 3rd-century BC border between Epidauros and Corinth only one is attested elsewhere,[402] frustrating any efforts to locate the boundary discussed with certainty. Epigraphic boundary markers like the rock-cut *horos* on the northwestern border of the Hermionid should also be considered,[403] but most *horoi* mark the limits of properties rather than city-states.[404]

Apart from literary and epigraphic sources, two groups of archaeological features — rural fortifications and non-epigraphic boundary markers — have in the past been used to investigate ancient borders. However, rural fortifications may have served a variety of functions and therefore cannot *a priori* be considered evidence for the course of ancient borders, while non-epigraphic boundary markers (varying in size and shape from stone cairns (*boleoi*)[405] to drystone walls)[406] are usually difficult to date and interpret.

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[401] The surviving inscriptions were collected by Harter-Uibopuu 1998 and Dixon 2000. Another document that might describe a border is the 4th-century BC Argive inscription *SEG* xxxvi 336 = *SEG* li 414 = *SEG* lix 356 (340–30 BC) (Vollgraff 1914, 330–353; Plassart 1915, 122–124; Μίτσος 1945, 53; Pritchett 1989, 88–89; Φάκλαρης 1990, 236–238; Piérart 2001, 28–30; Πίκουλας 2004), which list 40 otherwise mostly unattested toponyms under the headings "ΟΡΟΣ". Vollgraff 1914, 333 suggested that the document records the borders between different Arkadian settlements, while Plassart 1915, 123 read the inscription as a description of the Argive border. Πίκουλας 2004, 290–1 argued for a translation of "ΟΡΟΣ" as "fort" rather than "mountain" and an interpretation of the text as a description of Argive border fortifications. However, due to the uncertain location of the toponyms, the text cannot be used to reconstruct the territorial boundaries of 4th-century BC Argos.

[402] *IG* IV^2. i 71 (242–237 BC). For a discussion of this document, see below.

[403] *SEG* xlvii 319. Jameson et al. 1994, 531–2. 602–3.

[404] See for example *SEG* xxiv 275 (4th–3rd century BC); *SEG* xli 288 (5th century BC); *SEG* xlvii 417 (5th century BC).

[405] For example, on the border between Hermion and Epidauros (Jameson et al. 1994, 599–600).

[406] For example, the walls at Elaiochori in the Kynouria, which are thought to mark the eastern border of Tegea (Φάκλαρης 1990, 207–8).

In the absence of literary, epigraphic or archaeological sources, natural boundaries are often suggested as areas of study or approximate borders of ancient city-states.[407] Some borders described in Hellenistic arbitrations follow natural features,[408] but other territorial boundaries — for example the 2nd-century AD border between Tegea and Argos[409] — clearly did not. Using natural boundaries to model ancient territories can therefore be misleading.

Moving from this general discussion of available sources to the individual city-states in the Argolid, only the borders of Kleonai — which formed the northern part of the Argive territory for much of the 4th and 3rd century BC[410] — have so far been studied comprehensively. The city's territory probably covered ca. 110 km^2 and was bordered by the hills Spathovouni and Liouphti, the heights of Kalentzi, and the ridges of Phoukas, Liophata, Rachi Mantzorou and Psili Rachi. The border with Corinth and Tenea to the east is not entirely clear, but probably ran to the west of the hill Skionas (**figure 59**).[411]

Beyond Kleonai, the territorial boundaries of 2nd-century BC Hermion can be most fully reconstructed, in particular thanks to a border dispute that designates the area "of the Sellas [stream] and the 'Wild Harbours' up to Strouthous" for joint use with Epidauros (**figure 60**).[412] To the southeast of this area, Hermion's territory probably

[407] See, for example, Σακελλάριος 1971, 1–3 for the "natural boundaries" of the Korinthia.
[408] On the use of natural features as territorial boundaries in antiquity, see Daverio Rocchi 1988, 49–53; McCarthy 2008, 204.
[409] Paus. 8.54.7. Curtius 1851, 273; Loring 1895, 79; Pritchett 1980, 77.
[410] The borders of Kleonai probably became the frontiers of the Argive territory after the end of Argos' union with Corinth in 386 BC. For the union between Argos and Corinth (mentioned by D. S. 14.91.2–92.3; Xen. *Ages.* 2–17; Xen. *Hell*. 4.4.6–7. 19. 4.5.1–2. 4.8.13. 15. 4.8.34) and especially the question whether this union was concluded in two stages (the establishment of an *isopoliteia* in 392 BC and the complete unification in 390/89 BC), see Griffith 1950; Burford 1969, 27; Tuplin 1982; Whitby 1984; Kralli 2017, 6; Shipley 2018, 129.
[411] Marchand 2002b, 142–248.
[412] *IG* IV^2. i 74 (300–250 BC); *IG* IV^2. i 75 + *SEG* xi 405 (2nd century BC). The boundaries of this shared territory can probably be identified as Cape Iria (ancient Strouthous), the watersheds along the Driva, Koukouras, Psili Gonia and Prophitis Ilias hills and the Vigla ridge. For previous scholarship on this inscription, see Daverio Rocchi 1988, 156–61; Harter-Uibopuu 1998, 72–80; Jameson et al. 1994, 596–606; Dixon 2000, 123–75.

included the bay of Koilada, the plain of Didyma[413] and possibly the plateau of Iliokastro,[414] while in the northeast its territory probably extended to the area around the modern resort village of Porto Ydra, located between Akri Skyllaio and Thermisi. Akri Skyllaio itself probably belonged to Troizen (**figure 60**).[415]

The precise extent of Troizen's territory is generally difficult to reconstruct,[416] but epigraphic sources show that the city suffered a considerable loss of territory from the end of the 5th century BC onwards. The previously Troizenian island Kalaureia (modern Poros) is first attested as an independent polity in the late 4th-century BC,[417] while by the Hellenistic period Methana was no longer dependent on Troizen, but (as the newly founded Arsinoe) on the Ptolemies.[418] Furthermore, a boundary dispute between Epidauros and Arsinoe suggests that by the 3rd century BC Troizen had lost the mainland area west of the isthmus of Methana.[419]

Moving northwards, we know that the territory of Epidauros stretched across the entire Akte from the Argolic to the Saronic Gulf.[420] On the Argolic Gulf, the *Periplous* mentions 30 stades of Epidaurian coastline (probably the plains of Iria and Kantia (**figure**

[413] Jameson et al. 1994, 29. 596–606.
[414] Jameson et al. 1994, 29–32. 576.
[415] Scyl. 51.2 and *IG* IV 757 (2nd century BC) attribute Cape Skyllaion to Troizen. See also Paus. 2.34.7. Scyl. 51.2; Ptol. *Geog*. 3.16.11; Thuc. 5.53.1 apply this toponym to modern Akri Skyllaio, Plin. *HN* 4.18; Str. 8.6.13. 10.5.1 and presumably Liv. 31.44.1 to a cape on the Argolic Gulf (Frost 1980, 187; Jameson et al. 1994, 577; Dixon 2000, 253–6).
[416] According to Scyl. 54, Troizen directly bordered onto the territory of Epidauros, while *IG* IV^2. i 76+77 (2nd century BC) and *IG* IV 752 (2nd century BC) attest a shared territory of Troizen and Arsinoe south of Methana. Neither of these two borders has so far been identified. For previous scholarship on these inscriptions, see Harter-Uibopuu 1998, 97–109; Dixon 2000, 176–249; Carusi 2005.
[417] *IG* IV 839 (4th century BC). Figueira 2004, 622–3. Jameson et al. 1994, 87 suggested Antipatros' desire to punish Troizen for harbouring Demosthenes in 322 BC as a possible factor in the division of Kalaureia and Troizen.
[418] Piérart 2004, 611.
[419] *IG* IV^2. i 72 (after 228 BC). Jameson et al. 1994, 18; Harter-Uibopuu 1998, 34–41; Dixon 2000, 177–193.
[420] Scyl. 50. 54–5.

61)),[421] while on the Saronic Gulf Epidauros' 3rd-century BC border with Corinth is the subject of a surviving boundary dispute.[422] Understanding this important document hinges on the location of the Σπιραῖον, the only toponym in the inscription that is attested elsewhere. While for Thuc. 8.10.3, Σπειραιόν is a deserted harbour in the Korinthia just before the Epidaurian border (usually identified with the bay of Korphos[423]), Ptol. *Geog*. 3.16.12 and Plin. *HN* 4.57 use the toponym for a promontory between Epidauros and the harbour "of the Athenians" or the harbour "Anthedus", either modern Cape Spiri or Cape Trachili.[424] Since it is unclear if the boundary dispute refers to a harbour or a promontory, it remains uncertain whether the Epidaurian border ran to the north or south of modern Korphos (**figure 61**).

Taken together, the evidence from Hermion, Troizen and Epidauros allows a tentative reconstruction of the political geography in the 4th-century BC and Hellenistic Akte. This makes it possible to attribute most surviving fortifications in the region to one of the three city-states (**figure 62**) and lays the basis for analysing the sites within their geographical and political context.[425]

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[421] Scyl. 50. Epidauros probably also controlled the Benteni valley and the area east of ancient Lessa. For the Benteni valley, see *SEG* xxiv 274 (5th century BC); *IG* IV^2. i 701 (Jameson 1953, 163; Jameson et al. 1994, 570), for the area east of Lessa, see Paus. 2.26.1. The location of Lessa will be discussed in detail in section 6.3.

[422] *IG* IV^2. i 71 (242–237 BC). For previous scholarship on this document, see Harter-Uibopuu 1998, 16–23; Dixon 2000, 26–122.

[423] Fowler 1932, 22–3; Wiseman 1978, 140; Salmon 1984, 6–7. 32; Harter-Uibopuu 1998, 21; Dixon 2000, 58–60.

[424] For an identification with Cape Spiri, see Salmon 1984, 6; Magnetto 1997, 218, for an identification with Cape Trachili, see Wiseman 1978, 22–3 (disputed by Harter-Uibopuu 1998, 22; Dixon 2000, 59).

[425] Galatas: Megali Magoula (25), Limanaki 1 (48), Phourkaria (61), Troizina (80) and Limanaki 2 (99) can be attributed to Troizen, Ermioni (24), Lampagiana (45), Phranchthi (62), Vigla (84), Ermioni: Magoula (93) and Petrothalassa (138) to Hermion, and Ano Phanari (10), Ano Phanari: Vigliza (11), Benteni Kiapha (16), Gyphtokastro (27), Iria (31), Kampia (32), Kantia 1 (33), Kantia 2 (34), Palaia Epidavros 1 (54), Stavropodio (75), Tou Antreiomenou to Mnema 1 (77), Agios Leonidas (89), Skala 1 (104) and Xydeika (106) to Epidauros. Anathema (8), Iliokastro (29) and Soros (72) may have belonged to Troizen or Hermion, Akrotiri Iria 1 (90), Akrotiri Iria 2 (91), Vourlia 1 (86) and Vourlia 2 (87) to Hermion or Epidauros and Alogomandra Kalogirou (92), Choutalaiika (18), Kastraki (35), Kastro 2 (37), Lygourio 1 (49) and Lygourio 2 (100) to Epidauros or Argos.

Reconstructing the territory of Late Classical and Hellenistic Argos is more difficult and largely hinges on the location of dependent settlements and Argive *komai*.[426] Fortunately, the list of such sites is fairly long. Dependent settlement existed at Asine,[427] Eua,[428] Hysiai,[429] Kleonai,[430] Kyphanta,[431] Midea,[432] Mycenae,[433] Nauplia,[434] Orneai,[435] Tiryns[436] and Zarax,[437] as well as at Elaious,[438] Gympeis,[439] Kenchreai,[440] Lessa,[441]

[426] No inscriptions referring to Argive boundary dispute have yet been identified, even though *SEG* xxiii 178 attests a territorial dispute between Argos and Kleonai shortly after 229/8 BC. For this inscription, see Blegen 1927, 429–30; Bradeen 1966, 323–6; Ager 1996, 132–3; Magnetto 1997, 252–6; Uibopuu 1997; Harter-Uibopuu 1998, 323–6; Marchand 2002b, 516–8. 643–44. Many *komai* are known though the Argive practice of identifying individuals by their *kome* (Charneux 1984; Piérart 1985; Jones 1987, 114–115).
[427] *SEG* xix 317 (3rd century BC). Vollgraff 1916, 221; Charneux 1984, 217; Piérart 2004, 600.
[428] *SEG* liv 427 (early 4th century BC). Καλίτσης 1960, 6–8; Pritchett 1980, 124–127; 1991a, 169–70; Shipley 1997, 241; Piérart 2001, 29; Kritzas 2003, 58; Shipley 2004, 581; Kritzas 2006, 429–30.
[429] D. S. 12.81.1 Pritchett 1980, 54–64; Piérart 2004, 601.
[430] *IG* IV 616 (after 363 BC); *SEG* xxx 335 = *SEG* xxxi 305 (330–300 BC); *SEG* liv 424 (late 4th century BC). Piérart and Thalmann 1980, 261–269; Charneux 1984, 217; Piérart 1985, 351; Kritzas 2006, 427–429.
[431] Polyb. 4.36.5. Shipley 1996, 282–3; 2004, 583.
[432] *IG* IV 527; *SEG* liv 427 (early 4th century BC). Piérart 2004, 601; Kritzas 2006, 426.
[433] *IG* IV 498 (after 195 BC); *SEG* liv 427 (early 4th century BC); Scyl. 49. Charneux 1984, 218; Piérart 2004, 612; Kritzas 2006, 434; Shipley 2011, 129.
[434] *IG* IV 527; *SEG* liv 427 (early 4th century BC); Scyl. 49. Piérart 2004, 602; Kritzas 2006, 426; Shipley 2011, 129; Κριτζάς 2013, 293.
[435] D. S. 16.39.4. Pritchett 1980, 24–31; Πίκουλας 1995, 267–70. This *kome* is usually located at the site Lyrkeia (50) (see for example Pritchett 1980, 24–31; Πίκουλας 1995, 267–70), but from the late 4th century BC onwards could also be identified with the little known site of Sporitza (74) (Πίκουλας 1995, 269–70; Gallimore et al. 2017, 429).
[436] *SEG* liv 427 (early 4th century BC). Kritzas 2006, 426.
[437] *SEG* xvii 143 = *SEG* xviii 146/51 (before 222 BC); *SEG* xvi 280 = *SEG* li 423 (3rd century BC); Polyb. 4.36.5. Παπαχατζής 1976, 427; Shipley 1996, 310; 2004, 576–7; Kralli 2017, 250–1.
[438] *SEG* xxxiii 278 = *SEG* xxxix 345 (3rd century BC). This site is probably located north of the river Xavrio (Vollgraff 1915, 366; Charneux 1956, 599–600; Βερδέλης 1964, 121–2; Charneux 1984, 218; Piérart 1985, 351; Pritchett 1991a, 170–3; Piérart 2004, 600).
[439] Polyb. 4.36.5. Gympeis (also known as Glyppia) has been identified with Kastro tis Paliopanagias (38) (Le Puillon de Boblaye 1836, 97; Leake 1846, 362–4; Curtius 1852, 303–4; Frazer 1898, 381–2; Ρωμαίος 1906, 453–4; Walker 1936, 63; Παπαχατζής 1976, 417–8; Φάκλαρης 1990, 153–7; Pritchett 1991a, 155–6).
[440] *SEG* liv 427 (early 4th century BC); Str. 8.6.17. Kenchreai must be located on the road between Argos and Tegea, probably at Agia Paraskevi near Nera (Pritchett 1980, 54–64; Πίκουλας 1995, 270–2; Piérart 2004, 601; Kritzas 2006, 426).
[441] *SEG* liv 427 (early 4th century BC). The location of Lessa will be discussed in detail in section 6.3.

Leukai,[442] Lyrkeia,[443] Neris,[444] Polichna,[445] Prasiai,[446] and Prosymna[447], where the sites' location still lacks conclusive evidence (**figure 63**).[448] The distribution of these sites demonstrates that during the 4th, 3rd and 2nd centuries BC Argos controlled not only the Argive plain, but also the eastern foothills of the Artemision, Ktenias and Partheni mountains, certain areas in the Thyreatis and Kynouria, and the western part of the valley between the Argolic and Saronic Gulfs. The border between Argos and Corinth was probably located near the modern village of Stephani, making the plain of Prosymna part of the Argive territory,[449] but there is no evidence that Argos controlled either the plain of Phleious or the area north of the plain of Prosymna. This reconstruction of the Argive

[442] Polyb. 4.36.5. On the possible identification of Leukai with modern Chalasmata, see Shipley 1996, 308.
[443] *SEG* xvii 143 (before 222 BC); *SEG* liv 427 (early 4th century BC). Lyrkeia might be located near modern Skala (Charneux 1958, 7; Παπαχριστοδούλου 1970, 118; Παπαχατζής 1976, 186–8; Pritchett 1980, 12–9; Πίκουλας 1995, 263–7; Kritzas 2006, 434). Other suggestions are summarised by Πίκουλας 1995, 265–6.
[444] *SEG* liv 427 (early 4th century BC). The most convincing argument has been made for locating Neris at Kato Doliana (Pritchett 1980, 122–4; Φάκλαρης 1990, 94–6; Pritchett 1991a, 170; Shipley 1996, 277; Kritzas 2003, 58; Shipley 2004, 575; Kritzas 2006, 429–30).
[445] Polyb. 4.36.5. Polichna has been identified with modern Poulithra (Wace and Hasluck 1908, 176; Φάκλαρης 1990, 141–2; Pritchett 1991a, 140; Shipley 1996, 282; 2004, 575–6). For an alternative location of Polichna at Plaka Leonidiou, see Woysch-Méautis 2000, 170–85.
[446] Polyb. 4.36.5. Prasiai has been identified with modern Plaka Leonidiou (Bursian 1872, 133–4; Philippson 1892, 486; Wace and Hasluck 1908, 174; Ρωμαίος 1955b, 94; Waterhouse and Simpson 1961, 131; Παπαχατζής 1976, 429–30; Κουσκουνάς et al. 1981, 119; Spyropoulos and Christien 1985, 459; Φάκλαρης 1990, 129. 136; Pritchett 1991a, 142; Christien-Tregaro 1992, 158; Goester 1993, 47; Shipley 1996, 282; 2004, 586).
[447] *SEG* xvii 155 = *SEG* xxxiii 286 (4th century BC); *SEG* xxx 335 = *SEG* xxxi 305 (330–300 BC). This site is probably located near the Argive Heraion (Bursian 1872, 47; Vollgraff 1916, 223; Blegen and Blegen 1937, 11–22; Παπαχατζής 1976, 142; Piérart and Thalmann 1980, 261–269; Piérart 1982b, 127; Charneux 1984, 214; Piérart 1985, 351) or in the valley of Prosymna (Penttinen 1996a, 279; 2005, 113–4).
[448] In recent years, the number of known Argive *komai* has increased through the partial publication of an early 4th-century BC archive of ca. 134 bronze or lead tablets from Argos (*SEG* liv 427 (early 4th century BC). Kritzas 2003, 53–60; 2004, 19–20; 2006, 397–434; Κριτζάς 2007, 135–160; 2013, 277–301; Παπαδημητρίου 2013, 263–274). As the texts are so far not fully published, the reconstruction of the Argive territory may change significantly in the coming years.
[449] Marchand 2002b, 246.

borders makes it possible to attribute 42 towers, 21 fortified settlements, four forts and two drystone circuits to the territory of Argos (**figures 64–5**).[450]

However, this picture is far from static. In the valley of Kleonai, the Kynouria and the Thyreatis, the borders of the Argive territory shifted considerably during the 4th century BC and the Hellenistic period. While Kleonai was under Argive control between the early 4th century BC and 235 BC, the Kynouria probably remained in Spartan hands until the late 3rd century BC, when Polichna, Prasiai, Kyphanta, Zarax, Glyppia and Leukai are briefly attested as Argive.[451] The Thyreatis was long thought to have been given to Argos by Philip II after 338 BC,[452] but the early 4th-century BC archive from Argos mentions both Eua and Neris as Argive *komai*,[453] and thus demonstrates that at least part of the Thyreatis was already Argive by the early 4th century BC. This tentatively suggests that we should perhaps take Thucydides' description of Thyrea as "on the border of the Argeia and the Lakonike"[454] and Euripides' portrayal of the river Tanos as the border between Argos and Sparta[455] more seriously.

5.2 Settlement patterns in the Argolid (400 – 146 BC)

This brief analysis of the Late Classical and Hellenistic political geography not only allows us to attribute most fortified sites in the Argolid to a specific city-state, but also provides a starting point for investigating the landscape and settlement patterns within the individual territories. In terms of the natural environment, many aspects of the

[450] Whether the towers at Choutalaiika (18) and Lygourio 1 (49), the fort at Kastraki (35), the drystone circuits at Kastro 2 (37) and Alogomandra Kalogirou (92), and the possible fortified settlement of Lygourio 2 (100) belonged to Argos or Epidauros depends of the location of ancient Lessa.
[451] Shipley 2000, 376–9.
[452] See for example Shipley 2000, 376. 387; Piérart 2001, 27–30.
[453] Kritzas 2006, 429.
[454] Thuc. 4. 56.2.
[455] E. *El*. 410–11. On the identification of the ancient and modern river Tanos, see Pritchett 1982, 92–4.

Argolid's landscape have remained constant over the last 3000 years, but as mentioned above there are notable exceptions such as sea-level changes, alluviation at river mouths, the disappearance of the wetlands at Tiryntha and Lerna, the loss of upland soil and the resulting deposition of sediment in low-lying areas such as the Argive plain. These changes highlight that the natural landscape of the region is not merely a static backdrop to human activity but is both "result" and "participant" in a complex set of human-landscape interactions.

Reconstructing rural human activity in Classical and Hellenistic Greece is notoriously challenging and riddled with methodological difficulties. The surviving ancient texts are heavily skewed towards urban phenomena, giving rise to the long-held but now largely outdated view that ancient Greece was primarily — in M.I. Finley's words — "a world of cities".[456] This picture of Greece as a landscape of nucleated settlements surrounded by a largely "empty" countryside changed dramatically with the numerous intensive surveys conducted from the 1970s onwards,[457] which revealed scatters of Classical and Hellenistic rural "sites"[458] outside urban centres, often with a ceramic repertoire that resembles urban assemblage and implies that various economic and domestic activities took place in what was formerly seen as an "empty" transitional zone between urban centres.

Perhaps the most controversial site category recorded in many surveys are rural "farmsteads". Part of the problem is that in many surveys the term "farm" or "farmstead" was used to denote the smallest artefact clusters in a site hierarchy, rather than sites with

[456] Finley 1981, 3. For previous scholarship on the rural landscapes of ancient Greece, see for example McHugh 2017, 2–7.
[457] For a short history of survey archaeology in Greece, see for example Alcock 2000, 1–3; Alcock and Cherry 2004; Stewart 2010, 6–7.
[458] Definitions of what constitutes a "site" (usually based on find density) vary considerably between different surveys. For a comparison of different site definitions and classifications, see for example Mattingly 2000, 6–8; Stewart 2010, 11–14.

a specific and archaeologically recognizable agricultural function.[459] But even when we focus on rural sites that "could support either year-round or temporary occupation by a free or slave labour force engaged in agricultural activity for either subsistence or economic gain",[460] the question of how sites of this particular functional category can be identified on the basis of structural remains and surface finds remains controversial.[461]

The clearest archaeological evidence for ancient farming is agricultural installations, such as threshing floors, olive mills, presses and *patitiria*. But even leaving aside the difficulty that these structures can be difficult to date[462] and are often moved, reused or repurposed in later periods,[463] they are in themselves not sufficient to identify sites as ancient farmsteads.[464] Similarly, their absence does not mean that a site did not fulfil an agricultural function, since moveable equipment in perishable materials was probably widespread[465] and some crops (for example legumes) do not require any such specialised agricultural equipment.[466]

Like the presence of agricultural equipment, a site's location can help us to understand its function, but is often inconclusive. Surviving lease documents suggest that rural agricultural structures were usually located on the land farmed by the tenant.[467] Consequently, we should look for ancient farms in areas suitable for agriculture (or pastoralism), but not every site that fulfils this criterion is necessarily a farmstead.

[459] Stewart 2010, 14; Witcher 2012, 16.
[460] This definition of "farmsteads" was recently put forward by McHugh 2017, 1.
[461] For a summary of recent scholarship, see Morris and Papadopoulos 2005, 163.
[462] On the difficulties of dating threshing floors, see McHugh 2017, 87–8.
[463] McHugh 2017, 88.
[464] On isolated agricultural installations, see McHugh 2017, 87–96.
[465] Foxhall 1993b, 192–9; Mee et al. 1997, 261; Foxhall 2007, 136.
[466] See section 2.3. Pastoralist activities and the exploitation of marginal resources only rarely leave visible traces in the archaeological record. For the *NVAP*, Cloke 2016, 303–4 considered loomweights as indicators of pastoralist activities, but strictly speaking they only attest textile production.
[467] McHugh 2017, 49.

Therefore, since neither agricultural installations nor a location suitable to agriculture are sufficient to identify a site beyond doubt as a farmstead, scholars are increasingly turning to the detailed study of surface assemblages to gain new insights into the function of rural sites. One example is K. Winther-Jacobsen's recent work on ceramic assemblages from the *Troodos Archaeological and Environmental Survey Project* (*TAESP*). By dividing the surface pottery into different functional categories (e.g. cooking, heavy and light utility, lamps, transport and table vessels) and calculating the ratios of these categories within each assemblage, K. Winther-Jacobsen was able to identify five distinct "signatures" (or "indices") of different site types.[468] A similar method was used by C. Cloke to analyse the finds collected in the *NVAP*.[469] This artefact-function-based approach is only applicable when surface material has been recorded and published in sufficient detail, but even among sites published in less detail (for example in the *Southern Argolid Survey*), thinking about surface pottery in terms of functional categories can be useful. For example, artefact assemblages from domestic sites are typically characterized by a combination of fine wares, domestic wares and storage wares, which helps to distinguish unoccupied agricultural installations from genuine farmsteads.[470]

With regards to pedestrian surface surveys, the Argolid is comparatively well studied. Three areas in the region have so far been the focus of intensive surveys:[471] the

[468] Winther-Jacobsen 2010a, 274–84; 2010b, 59–130.
[469] Cloke 2016. For a summary of the methodology, see especially Cloke 2016, 152–63.
[470] McHugh 2017, 57–9.
[471] A fourth survey, the *Western Argolid Regional Project (WARP)*, was conducted between 2014 and 2016 in the upper Inachos valley, but the results published so far (Gallimore et al. 2017) are too preliminary for inclusion in the present study.

southern Akte,[472] the plain of Prosymna,[473] and the Nemea valley.[474] All three surveys employed a functional rather than purely descriptive site classification system, but unfortunately the material from the *Southern Argolid Survey* has so far not been published in sufficient detail for a direct comparison of artefact assemblage.[475]

All three surveys in the region have revealed comparable narratives. Key features include changing intensities of rural human activity and shifts from primarily nucleated to largely dispersed settlements patterns. The developments in the southern Argolid and the valley of Prosymna are quite similar. In both areas, the number of rural sites peaks in the Late Classical and Early Hellenistic period, with a clear break from the preceding 5th-century BC settlement patterns and a sharp decline in site numbers from the 2nd century BC onwards.[476] Many of these rural sites have produced a fair cross section of domestic pottery, pointing to a temporarily or all-year-round occupation.[477] In both areas, the rise in site numbers during the Late Classical and Early Hellenistic periods has been interpreted as the result of an intensification of agriculture.[478] This explanation neatly correlates with the pollen data from Thermisi and Lerna, which suggest a rise in olive and cereal cultivation in Late Classical and Early Hellenistic times and a partial abandonment of agricultural areas at the end of the Hellenistic period.[479] In the southern Argolid this development goes hand in hand with a shift in settlement patterns from

[472] This region was investigated between 1972 and 1982 in the *Argolid Exploration Project*. Jameson et al. 1994; Runnels et al. 1995.
[473] The valley of Prosymna was studied between 1988 and 1990 in the Swedish Archaeological Institute's *Berbati-Limnes Archaeological Survey*. Wells et al. 1990; Wells and Runnels 1996.
[474] Both the Nemea valley itself and some adjacent areas were explored between 1984 and 1990 in the *Nemea Valley Archaeological project (NVAP)*. Wright 1990; Alcock 1991; Cloke 2016.
[475] This contrasts with the material from the *NVAP* presented by Cloke 2016, especially in the site catalogue Cloke 2016, 504–977. For site classification in the *Southern Argolid Survey*, see Jameson et al. 1994, 248–52, for the discussion of site-functions in the *Berbati-Limnes Archaeological Survey*, see Penttinen 1996a, 231–72.
[476] Jameson et al. 1994, 251. 383. 394; Penttinen 1996a, 272–3; 2005, 114.
[477] Jameson et al. 1994, 383–5; Penttinen 1996a, 273–5. 278–9.
[478] Jameson et al. 1994, 384–7; Penttinen 1996a, 279.
[479] See section 2.2.

primarily nucleated settlements to dispersed family farms,[480] while in the Berbati valley the increasing number of agricultural sites may be connected to the resettlement of Mycenae around 300 BC.[481]

The *NVAP* has revealed a comparable overall development but a slightly different chronology, with a period of intense dispersed agro-pastoralist settlements during the Classical period and a subsequent decline in site numbers from the Hellenistic period onwards.[482] However, the discrepancy between the *NVAP* and the other two surveys in the region may in part be a product of the projects' chronological frameworks. While both the *Southern Argolid Survey* and the *Berbati-Limnes Archaeological Survey* recognised a distinct "Late Classical / Hellenistic" phase between ca. 400/350 and 250/200 BC,[483] the *NVAP* merely distinguished between "Classical" (ca. 480–323 BC) and "Hellenistic" (ca. 323–31 BC) sites.[484] It is thus possible that the "Classical" peak of rural activity in the Nemea valley is in fact contemporary to the early part of the "Late Classical / Hellenistic" development in the southern Argolid and the valley of Prosymna.

These intensively studied areas are very valuable for understanding Late Classical and Hellenistic fortifications in the wider region. Admittedly, the three surveys only cover a fraction of the region and many important areas, including the Argive plain, lie hidden under several metres of post-Hellenistic alluvial deposits.[485] However, as far as we know, the increase in dispersed agricultural settlements during the Late Classical and Hellenistic periods is remarkably consistent, not only within the Argolid, but also in other

[480] Jameson et al. 1994, 385.
[481] Penttinen 1996a, 281.
[482] Cloke 2016, 71. 168–9. For the interpretation of the Classical dispersed sites as mixed agro-pastoralist family farms, see Cloke 2016, 424.
[483] Jameson et al. 1994, 491; Penttinen 1996a, 271.
[484] Cloke 2016, 505–6.
[485] See section 2.2.

parts of the Peloponnese.[486] This strongly indicates that the Late Classical and Hellenistic Peloponnese was not merely a "world of cities", but also a world of rural farmsteads. Regardless of whether free citizen farmers, dependent labourers or slaves provided the main workforce,[487] the rural *chora* of cities in the Argolid was thus an agricultural and pastoralist landscape, which was economically and socially intertwined with life in the *asty*.

This strong connection between *asty* and *chora* has implications for the social, economic and psychological effects of warfare on a city. In ancient literary sources, invasions in the Argolid and elsewhere usually go hand in hand with the destruction and plundering of the rural countryside.[488] The economic impact of this type of warfare has been much debated, but even if the destruction of the countryside did not amount to a wholesale devastation, it must have caused considerable disruption and financial loss (for example, through damage at agricultural processing sites) and was clearly perceived as a threat in antiquity.[489] This means that a city-state's defence could not focus solely on the urban centre, but also had to encompass the rural *chora*.

The importance of agricultural considerations for strategic choices and military practices has been studied in detail for the Archaic and Classical periods, especially in

[486] For example in the Evrotas valley (Shipley 2002, 310–13. 316–7. 322–4), at Asea (Forsén 2003, 266. 270–1) or around Pylos (Alcock et al. 2005, 161–4).
[487] For a discussion of the workforce on ancient farms and a brief summary of recent scholarship, see McHugh 2017, 33–9.
[488] See for example Thuc. 5.53–4 (419 BC). 6.105 (414 BC); Xen. *Ages*. 2.17 (392 BC); Xen. *Hell*. 4.4.19 (391 BC); Polyb. 4.36 (219 BC). For the vocabulary of agricultural devastation, see Hanson 1998, 185–94.
[489] For the effectiveness of agricultural devastation in antiquity, see for example Harvey 1986, 205–10; Chandezon 1999, 196–201. 203–7; 2000, 321–42; Chaniotis 2005, 122–9; Krentz 2007, 170–3; Chaniotis 2011, 126–9. For a more general discussion of the economic effects of conflict, see Shipley 2018, 178–83. Hanson 1998 has argued that the amount of damage a hostile army could inflict on the rural countryside has so far been overestimated, while Foxhall 1993b concluded that the destruction of agricultural resources rarely threatened food supplies, but was a serious danger to a city's political unity.

connection to the rise of hoplite warfare.[490] However, by the 4th century BC — and even more so by the Hellenistic period — military practices had changed significantly. Warfare was no longer a seasonal activity centred around pitched hoplite battles, but could be fought all year round with a greater variety of troops (e.g. light armed troops, cavalry or military "specialists").[491] Together with the increase of dispersed rural settlements, these developments challenged Late Classical and Hellenistic city-states to adapt and refine their approaches to defending the countryside.

As will be seen in section 6.3, written sources provide little evidence for the defensive strategies in the 4th-, 3rd- or 2nd-century BC Argolid. There are no exceptional epigraphic records, no surviving theoretical discussions of defensive strategies and only few narratives that mention a city's response to conflict. This lack of written sources makes ancient fortifications a vital source for historical research in the region. Can they reveal how the city-states in the Argolid aimed to protect their rural territories?

This question is at the heart of the present study and will be investigated in depth in the next two chapters. For clarity's sake, possible defensive options have been divided into two groups. The first group encompasses "territorial defences", i.e. military-strategic defences that are centrally planned (and, presumably, financed) to protect the rural countryside. Chapter 6 will explore these military-strategic defensive options by testing the feasibility of the much-discussed interpretations of rural fortifications as signal-stations and as sites built to control roads, before analysing different possible strategies of territorial defence in detail.

[490] For a summary of past scholarship on this question, see Kagan and Viggiano 2013.
[491] For new types of troops, see for example Chaniotis 2005, 78–82; Sekunda and De Souza 2007, 326–30. 336–48; Sheldon 2012, 103–6, for the change from seasonal to all-year-round warfare, see for example Osborne 1987, 153–4; Penttinen 1996a, 261.

In contrast, the second group of defensive options — discussed in chapter 7 — focuses more strongly on providing security in individual parts of a city-state's territory. This can include the fortification of agricultural sites at various levels of the settlement hierarchy (from isolated farmsteads to major nucleated settlements), or the creation of an infrastructure that facilitates the evacuation of the countryside. Analysing and contrasting these two groups of defensive options will not only help to evaluate the function of individual sites, but will also contribute to our wider understanding of the dynamics of ancient warfare, providing a more refined and detailed framework for approaching rural fortifications in other parts of the Greek world.

CHAPTER 6: RURAL FORTIFICATIONS AS TERRITORIAL DEFENCES

6.1 Visibility: fortifications as watch-posts and signal-stations

a) Studying visibility: methods and practice

Judging by the frequent appearance of beacons and smoke signals in ancient literary sources, visual long-distance communication was a common feature of ancient warfare.[492] Simple smoke and fire signals are already mentioned in the *Iliad*,[493] while in Aeschylus' *Agamemnon* the news of the fall of Troy famously reaches Clytemnestra through a complex chain of beacon fires.[494] If nothing else, this passage demonstrates that visual networks were common enough in 5th-century BC Athens for the audience to appreciate the description.[495]

Thanks to the often spectacular views from ancient fortifications, "defensive networks" of fortified lookout-posts and signal-stations have been a recurring theme in fortification studies since the 19th century.[496] Following extensive work on the Attic

[492] For ancient sources on signalling, see Woolliscroft 2001, 159–171.
[493] Hom. *Il.* 18.207–13. Riepl 1913, 47; Russell 1999, 145; Woolliscroft 2001, 21.
[494] A. *Ag.* 288–313. The feasibility of this system has been questioned by Riepl 1913, 51; Diels 1924, 71–90; Aschoff 1984, 23; Lohmann 1993, 160, while other scholars have argued that the description is based on a contemporary system, for example a beacon chain established by the Persian general Mardonius in 480 BC (Hdt. 9.3) or a hypothetical system to warn Greek cities of the approaching Persian fleet (Hoernle 1921, 14–6; Leiner 1982, 61–3).
[495] Long distance signals in ancient Greek warfare were usually transmitted through beacon fires, and were thus largely limited to a small number of prearranged messages (Riepl 1913, 43; Russell 1999, 146; Woolliscroft 2001, 24). More complex signalling techniques were developed in the Hellenistic period, for example the Polybian system (Polyb. 10.45.6–474. Riepl 1913, 91–106; Forbes 1958, 175–178; Aschoff 1984, 49–52; Woolliscroft 2001, 36–44) or the combination of fire signals and synchronised water-clocks (Ph. *Bel.* 60; Polyb. 10.44.1–13. Riepl 1913, 66–70; Forbes 1958, 178–9; Aschoff 1984, 45–9; Woolliscroft 2001, 31–35). The transmission of signals by semaphore is only mentioned in Roman sources (Veg. *Mil.* 5.39; Anon. Byzant. 92.17. Woolliscroft 2001, 46), while descriptions of signals with shields (Hdt. 6.115; Xen. *Hell.* 2.1.27; D. S. 20, 51) may refer to heliographs or direct optical signals over short distances (Woolliscroft 2001, 49).
[496] For an early example, see Winterberger 1892, 122–4 on the rural fortifications of Attica. Beacons lit during the expedition to Kerkyra in 374/72 BC (Xen. *Hell.* 6.2.33) demonstrate that ancient signalling did not necessarily require permanent structures (Lohmann 1993, 159).

borders between the 1970s and 1990s,[497] this line of interpretation was widely adopted, leading to the "identification" of fortified signalling networks in many regions, for example the Megarid,[498] Phokis,[499] Kleonai and Phleious,[500] and most recently Sikyon.[501]

However, critics of "fortified visual networks" have rightly pointed out that with the limited signalling techniques available in antiquity, many "links" in the proposed networks were unsuitable for visual communication.[502] Moreover, most proposed "signalling systems" rest on the tacit assumption that beacon fires were lit atop ancient towers — a practice that despite the numerous literary references to optical signals is unattested in Greek antiquity.[503] From a methodological perspective, the rural fortifications of Eretria — often intervisible, but not a signalling system[504] — draw attention to the issue that intervisibility alone cannot be considered a decisive criterion for identifying visual networks. Or, as H. Lohmann put it, without further evidence it is impossible to identify a tower as an ancient signal-station "und sei die Aussicht noch so schön!"[505] Even after more than 40 years of research, signalling systems are thus a controversial topic in fortification studies, and some very fundamental questions — did fortified visual networks exist in ancient Greece, and, if so, how can they be identified — still remain unresolved.

This uncertainty partly stems from a methodological problem: the discrepancies between ancient and modern visibility. For example, weather conditions, modern

[497] Winter 1971, 43–5; Vanderpool 1978; Munn 1983; 1983; Ober 1985, 191–207; Camp 1991.
[498] Maele 1992, 104–6.
[499] Fossey 1986, 135–41; McInerney 1999, 343–6.
[500] Gauvin 1992, 135–44. In many cases (for example the "tower" at Koukougeras (Gauvin 1992, 141 figure 7.5. 143 figure 7.6. 144 figure 7.7; Casselmann 2010, 171)), S. Gauvin's identification of fortification is problematic.
[501] Lolos and Koskinas 2011, 260–1.
[502] See for example Lohmann 1993, 159–60; Fachard 2012, 271–3; 2016a, 229–30.
[503] Fachard 2016a, 230. Evidence for flat-roofed Greek towers is so far sparse (Haselberger 1979, 110–4).
[504] Fachard 2012, 271–92.
[505] Lohmann 1993, 159.

vegetation or building activity can easily obscure the view towards nearby sites. A useful toolset that helps to grapple with this problem is "classified viewshed analyses",[506] which allow us to identify areas that may have been visible from a particular site in antiquity.

In the present study, a "classified viewshed analysis" consists of three steps. First, a viewpoint is defined for each fortification, based laterally on the site's precise location,[507] and vertically on its elevation and original height,[508] as well as on the stature of the ancient observer.[509] After defining the viewpoint, a "binary viewshed" is calculated (**figure 66**). This viewshed shows areas that are theoretically visible, but does not take

[506] GIS "viewshed analyses" are widely (albeit sometimes too uncritically) used to study visibility in ancient landscapes (Wheatley and Gillings 2000; Leusen 2002, 6,10–2; Wheatley 2002, 209–219), but have so far only rarely been applied to Greek fortifications. Three exceptions are the studies of defensive networks at Mantineia (Topouzi et al. 2002) and in the Othrys mountains (Chykerda 2010; Chykerda et al. 2014a; 2014b, 292–301), as well as the towers on the Paximadi Peninsula in southern Euboia (Seifried and Parkinson 2014).

[507] For towers, the visibility analysis will be based on one viewpoint, whereas fortified settlements, forts and drystone circuits require a combined viewshed from several points.

[508] As the original height of most major fortifications (fortified settlements, forts and drystone circuits) is impossible to reconstruct, the elevation at ground level plus the stature of the observer will be used as the viewpoint's elevation. For freestanding ancient towers, two main methods of estimating the structures' original height have been proposed. The first method aims to deduce a minimum height from the quantity of fallen blocks and rubble (Lohmann 1989b, 50–51), but does not take into account the removal and reuse of ancient building material or the use of perishable materials such as wood or mud-brick (Thielemans 1982, 144). The second method is based on a standard width to height ratio (1:2 or 2:5) observed at many well-preserved ancient towers (Young 1956, 135). This calculation largely ignores aspects such as building materials, substratum, foundations or inside arrangements (Thielemans 1982, 140–141), but is nevertheless more reliable than estimating height from surrounding building debris. Despite its problems, the second method will therefore be employed in the present study to estimate the original height of freestanding towers. The diameter or wall length was measured on the outside of the building, except at towers with tapering bases, where the internal measurements were used. When the original height cannot be estimated, the area visible to an observer at ground level is calculated instead.

[509] In earlier studies, the average height of an adult male in Greek antiquity is often given as 162.2 cm, based on skeletal material from 61 male graves in Attica (Angel 1945, 284–285). This figure is problematic due to the comparatively small number of skeletons examined and a possible bias in favour of higher social-economic groups (Foxhall and Forbes 1982, 47). Therefore, the slightly higher figure of 169.46 cm (calculated on the basis of 97 male individuals found in Classical graves in mainland Greece, Magna Graecia and the Greek colony of Apollonia on the Black Sea; O'Connor 2013, 344–5) will be used in this study, taking into account the average distance between a person's eyes and the top of the skull.

into account the fact that in reality visibility varies depending on local conditions[510] and diminishes with growing distance.[511] To address this problem, the "binary viewshed" is classified according to different levels of actual visibility. The resulting "classified viewshed" distinguishes between four scenarios with different limits of visibility (**figure 67**): the observation of an individual (possible up to 2.4 km from the viewpoint), the observation of groups of individuals (up to 5.9 km from the viewpoint),[512] the observation of smoke (up to 20.6 km from the viewpoint),[513] and the observation of fire at night (up to 30 km from the viewpoint)[514]. Once calculated, these classified GIS viewsheds can be combined with "traditional" on-site observations to create a nuanced picture of site intervisibility and cast new light on the "signalling system controversy".

[510] In reality, visibility depends on numerous factors such as the psychophysical limits of human vision, atmospheric conditions and the properties of the observed object (Wheatley and Gillings 2000, 5–9; Conolly 2006, 231–232; Ogburn 2006, 406–7; Déderix 2015, 526).
[511] Fisher 1994, 164; Wheatley and Gillings 2000, 11; Ogburn 2006, 405.
[512] In the first and second scenario, the estimated limits of visibility are based on the "visual angle" of the observed object within the observer's field of vision. This method was first suggested by the Japanese landscape designer Tadahiko Higuchi (Higuchi 1988, 11–7), and is already widely used in the analysis of archaeological landscapes (see for example Wheatley and Gillings 2000; Letesson and Vansteenhuyse 2006; Ogburn 2006; Llobera 2007; Gillings 2009; Déderix 2015). The visual angle of an object within the observer's field of vision depends on its dimensions and its distance from the observer. When an object moves towards the observer, the visual angle increases, whereas moving away, the visual angle decreases (Ogburn 2006, 406). For a person with average eyesight, an object is not usually visible if the visual angle of its smallest dimension is less than 1', meaning that under favourable conditions the limit of visibility for a specific object lies at 3440 times its smallest dimension (Ogburn 2006, 410). A person (ca. 0.7 m wide) is thus not visible beyond a distance of 2408 m, a group of people (ca. 1.7 m high) beyond 5848 m. These upper limits of visibility can be corroborated by observations at fortified sites in the Argolid. For example, individual visitors at Mykinai's "Tomb of Atreus" could still be made out at a distance of nearly 2 km from the fortification at Agio Lias (2), while cars (roughly of the same height as a group of individuals) moving through the village of Dalamanara are still visible from the Argos' Larissa nearly 6 km away.
[513] This estimate is based on the "effective detection radius" of modern wildfires which lies around 13.4 km under poor conditions and 20.6 km in good conditions (Rego and Catry 2006, 201). The visibility of smoke signals is particularly susceptible to changing atmospheric conditions.
[514] For the observation of fire-signals at night, the theoretical range of visibility is limited by the luminous intensity of fire. For burning wood, the luminous intensity lies at approximately 0.1 cd/cm^2, which means that under optimal conditions a burning stack of wood ca. 1 m high is visible over 30 km (Aschoff 1984, 11–13). In practice, communicating over this distance would have been difficult and may have required lighting a fire on the roof or platform of a fortification – a practice that is so far unattested for the Late Classical and Hellenistic period (Haselberger 1979, 110–15; Fachard 2016a, 230).

b) Site visibility and intervisibility on the Akte

As outlined in section 5.1, the Late Classical and Hellenistic Akte was divided between the territories of Epidauros, Halieis, Hermion and Troizen, until Halieis came under Hermion's control in the 3rd century BC. All four cities have a good view of their immediate hinterland and nearby coastal areas, but they vary significantly in the number of visual links to and between rural fortifications.

The case for a fortified "signalling system" is particularly weak at Halieis and Hermion, where only a single rural fortification can be seen from each urban centre. At Halieis, this fortification — the possible fortified settlement of Petrothalassa (138) — has no further visual links and is therefore clearly not part of a larger network (**figure 68**). In contrast, the possible tower at Ermioni: Magoula (93) connects the city of Hermion directly or indirectly to nine further sites, including four fortifications on the Hermionian-Epidaurian border (**figure 69**).[515] However, this "network" is not only very complex and would leave plenty of scope for errors in the transmission of signals, but also hinges entirely on Ermioni: Magoula (93),[516] where both date and identification as a tower are uncertain. A further problem is that the fort of Anathema (8) — a crucial "relay station" in the "network" — may well belong to Troizen rather than to Hermion (**figures 70–1**).[517] Assuming that this interpretation is correct, no fortified signalling network can currently be reconstructed in Hermion's territory.

[515] Anathema (8), Iliokastro (29), Lampagiana (45), Soros (72), Vigla (84), Vourlia 1 (86), Vourlia 2 (87), Akrotiri Iria 1 (90), Akrotiri Iria 2 (91) and Ermioni: Magoula (93). In addition, Anathema (8) provides a visual link to Porto Cheli (64) and Petrothalassa (138).
[516] Jameson et al. 1994, 502–3.
[517] Anathema (8) can be approached nearly unobserved from Troizina (80), but not from the south. The case of the neighbouring drystone circuit of Soros (72) is less clear. Based on a supposed visual connection to Troizina (80), Jameson et al. 1994, 522 identified Soros (72) as Troizenian, but the site is in fact only visible from the acropolis of Iliokastro (29). Γιαννοπούλου 2009, 535 attributed both Soros (72) and Anathema (8) to Troizen without any further explanation.

To the north of Hermion, the commanding views from Troizen's acropolis include the coastal plain,[518] the strategically important straits of Poros,[519] and large parts of the Saronic Gulf. Based on the surviving rural fortifications, a small visual "network" to the northeast of Troizen would be possible (**figure 72**), but the intervisible sites do not command views that extend significantly beyond the area visible from the city-centre itself. It is therefore unlikely that they functioned as signal-stations between the *asty* and the *chora*.

Nevertheless, visibility may have influenced the location of Troizen's rural fortifications. For example, the fortified settlement of Phourkaria (61) on the southeast coast of the Akte has an excellent view of Dokos and Hydra, and might not only be connected to the sea route though the Gulf of Hydra, but also to the land route between Troizen and Hermion (**figures 73–4**).[520] Closer to Troizen, the fort at Galatas: Megali Magoula (25) commands a view of the coastal plain and the straits of Poros, including the two strategically important channels between Poros and the mainland (**figures 75–6**).

This leaves only the rural fortifications of Epidauros and Argos — the two largest city-states in the region — as possible candidates for fortified signalling systems. Despite the large number of rural fortifications, the city of Epidauros is visually connected only to the coastal sites of Ano Phanari (10) and Ano Phanari: Vigliza (11), both located at a suitable distance for smoke- and fire-signals (**figure 77**). The view from Ano Phanari (10) extends significantly beyond the area visible from the city-centre itself (**figures 78–9**), while the view from Ano Phanari: Vigliza (11) is more limited. This difference

[518] Since antiquity, this plain has probably expanded northward due to alluvial deposits, but this development may partly be offset by the local sea-level rise (see section 2.2).
[519] The straits of Poros gave access to Troizen's so far unlocated harbour at Pogon. On the possible location this harbour, see Welter 1941, 5; Φαράκλας 1972b, 24. Ε. 2.1; Γιαννοπούλου 2009, 533.
[520] Γιαννοπούλου 2009, 534.

suggests that Ano Phanari: Vigliza (11) probably did not serve as an Epidaurian watch-post on the Saronic coast.

The remaining rural fortifications in the territory of Epidauros have no visual connection to the urban centre, but rather form two separate "clusters" of intervisible sites (**figure 77 and table 12**). The first "cluster" consists of six fortifications in the valley between the Saronic and the Argolic Gulfs. The views from two of these sites — Lygourio 1 (49) and Lygourio 2 (100) — closely overlap, so that a scenario in which both functioned simultaneously in a signalling network is unlikely. The fort of Kastraki (35) and the tower at Choutalaiika (18) could have been used to observe the border area to the west and — if necessary — to transmit information eastwards to Lygourio, but not to Epidauros itself.[521]

The second "cluster" is located in the Benteni valley, which stretches between the inland plain of Tracheia and the coastal plain of Iria. These fortifications are not merely intervisible, but together allow the observation of the entire valley (see for example **figure 80**). Assuming that they were used contemporaneously (a question that due to the lack of finds at Skala 1 (104) remains unanswered), they could have formed a signalling chain along the southern border of the Epidaurian territory.[522]

c) Site visibility and intervisibility in the territory of Argos

Moving from the Akte to the territory of Argos, intervisible rural fortifications become even more common. Of the 65 Argive fortifications or possible fortifications recorded so

[521] The role of Kastro (37) remains unclear. This fort is located at an important pass between Lygourio and Arachnaio, suggesting that the intervisibility with sites in the valley may not have been the main consideration for choosing the site's location.

[522] The cluster had further visual connections to Vourlia 1 (86), Vourlia 2 (87), Akrotiri Iria 1 (90) and Akrotiri Iria 2 (91), but since their date and the course of the pre-2nd-century BC territorial boundaries in this area are uncertain, they will not be considered part of the visual "network" in the Benteni valley. The tower at Tou Antreiomenou to Mnema 1 (77) is visible from Stavropodio (75), but has little potential as a "signalling-station".

far, only seventeen are visually isolated or form isolated "pairs of sites". Unless originally visible from fortifications that no longer survive, these seventeen sites cannot have been part of a fortified signalling network.[523] The remaining 48 sites are either immediately visible from Argos (12), or indirectly connected to the city through intervisible fortifications (**figure 81**). For the present analysis, they can be divided into the central sites around the gulf and the plain, and six "clusters" on the edges of the Argive territory (**figure 82 and table 13**).[524]

Among these "clusters", the sites of "cluster 1" (Pyrgouli (71) and Kazarma (39)) not only share similar views, but are also visually isolated from other rural fortifications during the day-time. Considering that the area visible from the sites is located less than eight hours' walk from Argos, this hardly provides a reliable method of informing the city of threats on the Epidaurian border (**figure 83**).[525] Similarly, the area visible from the three sites in the plain of Prosymna can also be observed from the fort of Agio Lias (2) (**figure 84–5**), showing that only Agio Lias (2) and possibly Vigliza (85) had any potential as "signal-stations".

Moving further south, "cluster 6" is particularly complex, with lines of visibility radiating outwards from the key sites of Agios Andreas (4), Prosilia (66), Xylopyrgo

[523] The isolated sites are the towers and possible towers of Charadros (17), Douka Vrysi (19), Iliopoulaiika (30), Kephalovryso (40), Nera (53) Spathokommeno (73), Malantrenion (101), Marmaralono Agiou Petrou (102), and Zogka: Asprorrema (145), the fort of Kastro tis Paliopanagias (38) and the fortified settlements of Ierakas (28), Kyparissi (44) and Tyros (83), the "pairs" of sites are the tower of Tourkovrysi (78) and the possible fortification at Tourkopigadou (157), and the fortified settlements at Plaka Leonidiou (63) and Poulithra (65).

[524] Although not part of a site "cluster", the possible tower at Karya (97) on the eastern slope of the Artemision mountains and the possible fortified settlement of Skala 2 (142) in the Inachos valley have extensive visual connection. However, since it is unclear whether an ancient structure ever existed at either of the two sites, they will not be considered part of an Argive "signalling system". For Karya (97), Πίκουλας 1995, 207 suggested that the east corner of the site's Byzantine remains may incorporate parts of an ancient tower, but the polygonal blocks visible are interspersed with tiles and probably not *in situ*. For the remains at Skala 2 (142), see Πίκουλας 1995, 188–91.

[525] This assumes an average walking speed of 5 km/h, which is probably an underestimate, considering that even Roman legionaries carrying armour, weapons and kit moved at an average of 5 km/h (Riepl 1913, 129).

(88), and Elliniko Astrous (21) (**figure 86**). Given this complex pattern of intervisibility, it is difficult to evaluate whether the sites formed a visual "network" around Argos (12) or a local centre in the region, or whether the visual links are coincidental.

In contrast to the sites in the clusters 1, 2 and 6, the fortifications in the remaining three "clusters" would be well placed to transmit optical signals. The fortifications around Achladokampos (1) (**figure 86**) and in the Xerias valley (**figures 82, 87 and 88**) form "chains" of intervisible sites,[526] while the rural fortifications around Kleonai (41) make it possible to observe areas within and beyond the Kleonian territory that are not directly visible from the city itself (**figure 89**). The fortifications in all three "clusters" are located close enough to each other to allow signalling both during the day and at night-time.

So far, this discussion has focused on the edges of the Argive territory, while the "central" fortifications around the Argive plain and the Argolic Gulf have only been mentioned in passing. Given the nearly inevitable intervisibility across both areas and the natural prominence of Argos' Larissa hill, the potential of these sites as possible signal-stations is difficult to evaluate.

Around the Gulf, two observations suggest that the intervisibility of the rural fortifications may at least in part be coincidental. Firstly, most sites are located more than 20.6 km apart, meaning that communication would only have been possible at night-time. Secondly, the viewsheds of sites located in closer proximity to each other usually closely overlap,[527] so that most fortifications would not be ideally placed to form a signalling system.

[526] The sites in the Xerias valley were originally linked to Argos (12) through the tower at Akova: Chouni (108), which no longer survives. For the view from this tower, see Πίκουλας 1995, 201.
[527] For example, at Kondyli (98), Asini (14), Nafplio (52), Lileika Xeropigadou (47), Paralio Astros (56) and Agios Andreas (4).

Moving inland, fortifications are rarely intervisible along the edges of the Argive plain and often lack direct connections to their nearest neighbours (**figure 90**). For example, neither Pyrgiotika (70) nor Nafplio (52) are visible from the tower at Aria (13) — connections that would easily have been possible by placing the tower on the summit of the Vouno Arias rather than on its western slope. In addition, towers often lack visual connections to the nearest fort or fortified settlement,[528] and instead have a good view of the central Argive plain, especially of Argos (12) itself. This suggests that — if the fortifications around the Argive plain did form a signalling system — the "visual network" was not intended to alert nearby sites, but to transmit information towards Argos (12) itself.

Assuming that this hypothesis is correct, rural fortifications that do not "add" to Argos' viewshed are unlikely to have functioned as signal-stations. This means that eight sites around the Argive plain can be excluded from the possible "network",[529] leaving only six "central" sites as possible signal-stations.[530] Together with the fortifications around Kleonai (41), around Achladokampos (1), in the Xerias valley and possibly in the Zavitsa mountains, these sites allow a tentative reconstruction of a possible Argive signalling network (**figure 91**), which focuses on connecting urban centre and surrounding countryside, and is thus markedly different from the chain of intervisible fortifications along the southern border of the Epidauria.

[528] For example, Agios Adrianos (3) cannot be seen from the tower at Pyrgiotika (70), Nafplio (52) from the tower at Aria (13), Asini (14) from the possible tower at Kondyli (98), or Agios Lias (2) and Mykinai (51) from Kophy Rachi (42).
[529] Amygdalitsa (7), Phichtia: Kokkinia (57), Phichtia: Paliopyrgos (59), Phichtia: Stathmos (60), Tiryntha (76), Kalkani (95), Kapsala (96) and Perasphalktra (103).
[530] Elliniko: Ellinikaki (22) (providing the visual link to Elliniko: Kephalari (23)), Mykinai (51) (providing the visual link with the tower of Phichtia: Limiko (58)), Agios Adrianos (3) (providing the visual link with the tower of Levkakia (46)), Pyrgiotika (70), Aria (13) and Nafplio (52).

d) Evaluating the "visual networks"

Comparing the hypothetical Argive and Epidaurian signalling systems further reveals that it is only at Argos that the cumulative viewshed of sites in the "visual network" covers most of the city's territory (**figure 92**). At the same time, this cumulative viewshed rarely extends outside the area controlled by Argos,[531] while on the Akte, views beyond territorial boundaries are common.

These observations prompt the question of why visual connections might have played such different roles in various parts of the region. One factor that must have influenced the creation of "visual networks" is the local topography. While the plains and wide valleys in the Argive and Epidaurian territory lend themselves to observation from intervisible sites, the mountain ranges of the southern and central Akte do not.

A related factor is the shifting focus on maritime versus overland routes. Even without a detailed discussion of ancient roads in the region, the local topography shows that the Epidauria and the northern part of the Argive territory were more reliant on overland routes than the southern Akte, the Thyreatis or the Kynouria. "Visual networks" are thus more prevalent in areas where overland communication predominates.[532]

The size of a city-state may be a third factor that influenced the development of fortified signalling systems. Argos and Epidauros were not only the sole cities in the region with possible signalling systems, but also held the largest territories, with Argos controlling both the greatest territory and the most extensive "visual network".

The local topography thus seems to have had a profound effect on the use and construction of intervisible rural fortifications, but in view of differences between the

[531] Exceptions are some summits in Arkadia, the Akte, and the Arachaion mountains, the east coast of the Argolic Gulf, the central valley between the Saronic and Argolic Gulfs, and several areas in the Korinthia (including Acrocorinth and Perachora).
[532] This pattern is paralleled elsewhere, for example in neighbouring Mantineia (Topouzi et al. 2002).

rural fortifications in the Argolid and elsewhere, the natural environment should not be seen as the only factor determining the distribution of ancient fortifications. For example, the towers in Molossia — like the northern territory of Argos, a region reliant on overland routes — do not form visual networks,[533] while the undoubtedly "maritime" towers of Kea are visually strongly interconnected.[534] This demonstrates that, despite the importance of the landscape setting, the construction of fortified "signal-stations" required conscious decisions, which may have been informed and influenced by factors beyond the local topography (e.g. a city's military organisation, the funds available for the construction of new sites, the pre-existence of the intervisible sites, the political development and structure of the rural territory, or experiences in specific conflicts).

For the Argolid, most of these non-topographical factors are difficult to reconstruct. Unlike in Attica, Samothrake or Kolophon,[535] we do not know who manned the region's rural fortifications. Furthermore, the few surviving documents that record financial arrangements for the construction of fortified structures — for example Rhodes' loan of 100 talents to Argos[536] or the Troizenian *epidosis* decree for the construction of the city's *diateichisma*[537] — concern urban sites. This means that the military and financial backgrounds of rural fortifications (let alone the funds available at different times in the individual city-states) remain obscure.

In addition, any attempt to date the hypothetical signalling systems is dependent on the dating of individual sites, which is often problematic. At Argos, most sites can only

[533] Nakas 2016.
[534] Μενδώνη 1998.
[535] In 4th- and 3rd-century BC Athens, young citizens were stationed at rural forts as part of their military training (Chaniotis 2005, 28–9. 51). According to *Syll.*[3] 502, mercenaries were stationed at Hellenistic forts in the Samothrakian Peraia, while a fort of Kolophon was manned by citizen troops (Ma 2000, 342–3).
[536] Vollgraff 1916; Maier 1959, 145–8.
[537] *IG* IV 757 (146 BC) (Frickenhaus and Müller 1911, 31; Welter 1941, 12; Maier 1959, 139–45; Winter 1971, 114; Lawrence 1979, 150; Migeotte 1992, 49–54; Sokolicek 2009, 132).

be dated very broadly to the period between ca. 400 BC and the Roman conquest, which leaves open the question of whether or not individual fortifications are roughly contemporary. Looking beyond the timeframe of 400–146 BC, many rural sites in Argos' "network" have produced pre- or Early Classical finds, but usually no structural remains before the 4th century BC.[538] This suggests that Argos did not widely reuse earlier fortifications in its "signalling system". Most Epidaurian sites show a similar chronological pattern, with the exception of some forts along the southern border, which belong to the period after 300 BC,[539] but include prehistoric structures and surface finds.[540] Pre-existing sites thus played a role in the possible Epidaurian signalling system, but in general do not seem to have determined the creation of visual networks.

Turning to political structures, two factors that could have influenced visual "networks" are the organisation of a territory or population into smaller units — the *komai* mentioned above — and the incorporation of formerly independent cities with their own pre-existing signalling systems. *Komai* are so far only attested at Argos and Epidauros,[541] and only at Argos have they been at least partially identified. Their distribution does not generally overlap with Argos' possible "signal-stations" (**figure 93**), suggesting that the organisation of the territory into *komai* did not necessarily shape the city's visual "network". Several Argive *komai* were originally independent city-states,[542] but the unclear chronology of fortified sites makes it difficult to identify local "signalling systems" that were absorbed into a wider Argive "network". For example,

[538] Exceptions are the prehistoric fortifications at Mykinai (51) and 8th-century BC remains at Asini (14–5) (Wells 1988, 262–4).
[539] Two fortifications in this network (Iria (31) and Stavropodio (75)) were built around or after 300 BC, but the remaining sites cannot be dated more closely than 400–146 BC.
[540] Benteni Kiapha (16) (Φαράκλας 1972a, E. 3.8), Stavropodio (75) (Αρχοντίδου-Αργύρη 1975, 77–9) and Gyphtokastro (27) (Αρχοντίδου-Αργύρη 1975, 79; Touchais 1977, 554).
[541] See, for example, Jones 1987, 107–9. 114–5; Piérart 2004, 607. For possible *komai* in 2nd-century BC Troizen, see Jones 1987, 111–2.
[542] For the identification and location of these sites, see section 5.1.

the "cluster" around Kleonai (41) might have been built before the incorporation of the city into the Argive territory, during the period of Argive control, or even after Kleonai regained its independence in 235 BC.

To return finally to the initial question of this chapter: did the rural fortifications in the Argolid form signalling networks? The detailed viewshed analysis has not only demonstrated that many fortified sites in the region are intervisible, but also that selected rural fortifications could have been used to transmit visual signals between rural fortifications or between rural sites and the urban centres.

However, the fortifications in the visual "networks" are very heterogeneous in terms of date, type, size, and construction technique. For example, the possible "signal-stations" in the territory of Argos range in type from towers to fortified settlements (**figure 91**), and in construction technique from the carefully fitted polygonal masonry at Agios Adrianos (3) (**figure 94**) to the drystone walls at Vigliza (85) (**figure 95**). At first glance, the Epidaurian forts and towers appear to be more homogenous, but on closer inspection they similarly vary in date, type, construction technique (**figures 43 and 96–7**) and previous use. In addition, many possible visual networks seem unnecessarily complicated and usually do not make use of the most effective points for establishing visual connections (for example the summits of mountains).

Even taking into account possible local variations in building techniques or site location, these differences between individual fortifications suggest that they were not constructed in a single building programme or planned as a coherent system. Transmitting signals would at times have been possible but was probably neither the only nor the primary function of most fortified structures.

6.2 Movement: fortifications and roads

a) Tracing ancient movement: the archaeological record

Today, the Late Classical round tower of Agios Sostis (5) seems isolated, remote and frequented by few visitors other than occasional herds of goats (**figure 98–99**).[543] This impression may be correct in the 21st century, but for antiquity or even the early modern period it is very misleading. Thanks to Pausanias[544] and his 19th-century counterparts (travellers like Lord Byron's friend and agent E.J. Trelawny[545]), we know that the nearby Agios Sostis pass was a well-known route between the Korinthia and the Argive plain, which played an important role during the Battle of Dervenakia in the Greek War of Independence.[546] Instead of picturing the region around the tower as isolated and remote, we should envisage a major regional thoroughfare.

Such connections between ancient fortifications and pre-modern roads have not escaped the notice of previous archaeologists and historians. Pre-modern roads are one of the best-studied aspects of the Argolid's landscape and many prominent scholars in this field (for example W.K. Pritchett and Γ.Α. Πίκουλας) have argued that fortified sites were used in antiquity to control and monitor movement along these routes.[547] This hypothesis can be traced back at least into the 19th century, when scholars were strongly influenced by their own experience of travelling through the region only decades after the Greek War of Independence.[548]

[543] For the date of the tower, see Wiseman 1978, 116; Cloke 2016, 910.
[544] On the identification of the route described by Paus. 2.15.1 with the path over the Agios Sostis pass, see Roux 1958, 173; Παπαχατζής 1976, 125; Wiseman 1978, 113–4; Κορδώσης 1981, 46; Salmon 1984, 36; Bynum 1995, 77–99; Πίκουλας 1995, 55; Tausend 2006, 21–2; Marchand 2009a, 156; Cloke 2016, 911.
[545] Trelawny 1858, 215–6.
[546] Wiseman 1978, 114.
[547] See, for example, Pritchett 1980, 29–31; Πίκουλας 1995, 227; Tausend 2006, 65 for the tower at Gymnon (26).
[548] For example, W. Vischer, who travelled through the Argolid in 1853, mentions the now lost tower of Ellinon Lithari (113) in the same breath as the Battle of Dervenakia (Vischer 1857, 290).

Despite this long research history and the undeniable coincidence of ancient fortifications and early modern roads, it remains largely unclear how rural fortifications could have controlled and restricted movement in practice.[549] For the Argolid, this raises the question of whether we should understand rural fortifications such as Agios Sostis (5) as ancient "guard points" or whether their location was chosen for different reasons (e.g. easy access to other parts of the region).

Ancient roads themselves are the obvious starting point for investigating this important question. In the Argolid, they are attested though pre-modern bridges,[550] cuttings,[551] rock-cut wheel-ruts,[552] and retaining walls.[553] This means that despite intensive topographical research archaeologists are limited to studying "engineered paths" and carriageable "roads",[554] while simple tracks may leave no traces in the

[549] For example, Munn 1993, 16 pointed out that such an interpretation is not supported by literary sources, while Fachard 2016a, 228 highlighted the difficulties of demonstrating archaeologically whether a site was used to block a road. Suggestions that ancient fortifications may have served as customs houses were also largely rejected (see for example Ober 1985, 200), chiefly because customs duties or import taxes are only rarely attested for ancient land routes (Andreades 1933, 138). However, Fachard 2013, 103–5; 2017b, 50–2 recently argued that the Boiotian fortification at Eleutherai might have been used to collect import taxes and implement the "leave of passage" that was occasionally imposed on Athenians entering Boiotia. For future research, it could therefore be worthwhile to re-examine the question of import taxes and customs-dues in overland transport.

[550] Examples are the now lost Hellenistic bridge over the Longopotamos river (Wiseman 1978, 82–6; Πίκουλας 1995, 33; Marchand 2009a, 123) or the Mycenaean bridges near modern Arkadiko (Tausend 2006, 151. 201) and Mykinai (Tausend 2006, 23. 199–200).

[551] See, for example, the cutting at the Sanga pass between the Argive plain and the plain of Mantineia (Πίκουλας 1995, 104–9. 288–90; Tausend 2006, 95; Pikoulas 2007, 83).

[552] For wheel-ruts in the Argolid, see below. In Greece, extra-urban stone-paved roads were not usually constructed before the Roman period (Pikoulas 2007, 82–3).

[553] Literary sources are also commonly used to reconstruct ancient road networks, but this approach relies strongly on the identification of ancient settlements, which in the Argolid is often uncertain (see, for example, the various identification of Agios Andreas (4) as Θυρέα (Le Puillon de Boblaye 1836, 69; Pritchett 1995, 236; Shipley 1996, 279), Ἀνθήνη or Ἀνθάνα (Philippson 1950, 483; Παπαχατζής 1976, 303; Κουσκουνάς et al. 1981, 119; Winter and Winter 1990, 239; Φάκλαρης 1990, 55), Μεθάνα (Spyropoulos and Christien 1985, 458. 462; Christien 1989, 79), and Πρασιαί or Βρασιαί (Leake 1830a, 485; 1846, 295. 302; Woysch-Méautis 2000)). Both Πίκουλας 1995 and especially Tausend 2006 furthermore regarded towers as evidence for ancient roads, but in the present study fortified site cannot *a priori* be connected to roads.

[554] Following Fachard and Pirisino 2015, 149, the term "road" will be used for carriageable routes, "engineered path" for routes that are not carriageable, but supported by terrace walls or carved in the rock, and "track" for routes that required no constructions. "Route" is used for any connection between different points, regardless of construction technique.

archaeological record. Depending on the local geography and geology, even "engineered paths" and "roads" can remain elusive. For example, wheel-ruts are only necessary in uneven, rocky terrain[555] and are thus largely missing in the eastern Argolid.[556] Lack of preservation can be a further problem, especially when routes continued to be used into the modern period and later constructions have obliterated the ancient remains.[557]

In interpreting this fragmentary archaeological record, past scholars have usually focused on reconstructing the principal routes between major settlements, but more recent studies like J. Marchand's work around Kleonai illustrate that before the Roman period travel was not confined to "main roads". [558] This not only means that the importance of Classical and Hellenistic local roads has hitherto been underestimated, but also that the limited remains of pre-modern roads visible today may not (as previously assumed) belong to routes between major centres. Another problem is the lack of secure dating methods for retaining walls and road surfaces, which means that the present study is largely limited to ancient bridges[559] and wheel-ruts (either carved in the bedrock to guide wheels over uneven outcrops or developed through wear over long periods of time),[560] and is consequently heavily biased towards carriagable roads.

[555] Πίκουλας 1995, 21–2; Pikoulas 2007, 82; Πίκουλας 2012, 34.
[556] For archaeological remains of roads in the eastern Argolid and on the Akte, see Jameson et al. 1994, 48–9; Tausend 2006, 149–69.
[557] See for example Tausend 2006, 152.
[558] Marchand 2009b, 43–4.
[559] In Greece, bridges are rare before the Roman period (Pikoulas 2007, 83).
[560] Pritchett 1980, 168–170; Πίκουλας 1995, 21; Marchand 2009b, 16; Πίκουλας 2012, 34. The exact date of wheel-ruts is difficult to determine, but in general they are likely to predate the 5th century AD, given the lack of widespread wheeled traffic in rural Greece between the end of the Roman period and the arrival of motored transport, (Πίκουλας 1995, 25; Lolos 1998, 1; Pikoulas 1999, 306–11; 2007, 80; Marchand 2009b, 15; Lolos and Koskinas 2011, 93–4). Clark 1858, 65 suggested that some supposed wheel-ruts may in fact be more recent. Travelling on the Peloponnese, he observed that "the ordinary mode of carrying wood in Greece is to tie the heavier ends of the poles on each side to the back of the horse or donkey, and suffer the other ends to trail along the ground, thus making two parallel ruts which in course of time may attain the depth of and be mistaken for wheel-tracks." However, some of wheel-ruts in the territory of Kleonai were clearly cut rather than worn into the bedrock by repeated use (Marchand 2009b, 16).

This bias is very problematic. Carts were by no means the only way of transporting goods and people through ancient Greece. Mules and donkeys, capable of carrying loads of up to 150–180 kg,[561] were probably more common,[562] but paths and tracks used for pack animals may leave no datable traces at all. In addition, ancient literary and epigraphic sources demonstrate that carts were used in various contexts, such as agriculture,[563] heavy goods conveyance,[564] trade (although the volume of overland trade is still debated),[565] personal transport,[566] or military campaigns.[567] Identifying a route as carriagable therefore does not contribute significantly to identifying its functions.

b) Tracing ancient movement: A least cost path analysis

These problems demonstrate that a comprehensive reconstruction of the pre-Roman road network on the Akte and in the territory of Argos would not prove feasible. Instead of offering yet another primarily topographical study of the roads in the Argolid, the current chapter will therefore compare the surviving remains of ancient roads to the most efficient routes between different urban centres and secondary settlements in the region

[561] On the load bearing capacity of mules and donkeys, see Vigneron 1968, 135; Cotterell 1990, 194; Roth 1999, 205–7; Adams 2007, 77–81; Raepsaet 2010, 589; Mitchell 2018, 131.
[562] Horden and Purcell 2000, 131; Raepsaet 2002, 51–4. 68–71; Adams 2007, 57–8; Fachard and Pirisino 2015, 141. In addition, donkeys have a higher thirst threshold than any other equid, making them particularly suitable for use in dry climates (Adams 2007, 58; Mitchell 2018, 24).
[563] Animal drawn vehicles are, for example, mentioned as agricultural equipment in Hes. *Op*. 426. 453–457 (Raepsaet 2010, 598).
[564] For example, to transport building material (Burford 1969, 187–8; Raepsaet 2010, 592).
[565] Lolos and Koskinas 2011, 96. For the debate on the economic viability of ancient overland trade see, for example, Laurence 1998; Shipley 2018, 272.
[566] Plut. *Moralia* 304e mentions a Peloponnesian *theoria* traveling to Delphi by wagon in the late 7th-century BC, but it is unclear if this reflects practices in the Archaic period or during Plutarch's lifetime. Hellenistic "guidebooks" focus on travel on foot, but also include some information on carriagable roads (Lolos and Koskinas 2011, 97, for the text see Pfister 1951, 72–95; Arenz 2006, 103–116, for the date Ferguson 1911, 261. 464–6; Pfister 1951, 44–6; Arenz 2006, 49–83).
[567] Pritchett 1974, 41–4; Raepsaet 2010, 599–600; Lolos and Koskinas 2011, 94–6. Xen. *Lac*. 11.2 attests that the Spartan army used both carts and pack animals (Lolos and Koskinas 2011, 95), but Pritchett 1991a, 175–6 cautions against the notion that ancient armies always travelled with wagons.

and investigate how this comparison informs our understanding of the archaeologically attested carriagable roads and the nearby fortifications. [568]

This approach firstly requires a dataset of surviving road sections in the Argolid, including the spatial references needed to plot the remains in a GIS program. The dataset compiled for the current study combines wheel-ruts and datable bridges recorded in four different studies,[569] and relies on the spatial information given by previous scholars (**figure 100**).[570]

Secondly, it is necessary to identify the most efficient connections between the urban centres and secondary settlements in the region. In recent years, GIS-based "least cost path analyses" have become an increasingly common tool for identifying and analysing optimal routes through ancient landscapes.[571] To identify least cost paths, a raster map is used to represent the local topography. Every cell in this raster is assigned the "cost" necessary to traverse the cell, which is used to calculate a cumulative cost surface based on a specific origin of travel. This cumulative cost surface then provides the basis for constructing the most efficient route from a point of origin to a specific destination.

Most cost surfaces are based on the cells' slope, but least cost paths can vary considerably depending on the specific function used to generate the cost surface.[572] For the present study, it is thus necessary to identify a function that is suitable to modelling the optimal routes for ancient wheeled traffic.

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[568] A similar method was used to evaluate the function of roads in Attica (Fachard and Pirisino 2015, 141).
[569] Φάκλαρης 1990, 209–16; Πίκουλας 1995; Tausend 2006; Πίκουλας 2012.
[570] Three of the four studies were conducted before the widespread use of handheld GPS-devices, so that the accuracy of this spatial information may vary. GIS-analyses that rely on the exact position of the remains are therefore not feasible, but revisiting all remains of ancient roads in the region was beyond the scope of the present study.
[571] See for example Bell et al. 2002; Newhard et al. 2014; Fachard and Pirisino 2015, 141; Güimil-Fariña and Parcero-Oubiña 2015.
[572] See for example Kantner 2012; Herzog 2013.

Looking at the archaeological remains of roads in the region, the most securely attested route runs along the northern bank of the Xerias valley, connecting Argos and Mantineia. This road, traceable through surviving wheel-ruts in at least 4 different locations,[573] can serve as a point of reference for evaluating different least cost path functions.

Figure 101 shows the wheel-ruts between Argos and Mantineia together with three different possible least cost paths. The first route is calculated with the ArcGIS Path Distance tool, the second with the so-called "Tobler's Hiking Formula" as applied by Tripcevich 2009, and the third with "Tobler's Hiking Formula" as applied by White 2015. When the resulting routes are compared with the actual course of the ancient road between Argos and Mantineia, the third route corresponds most closely to the archaeological remains, while the first and the second functions either over- or underestimate the effect of the slope on the chosen route.[574] Of the three functions tested, "Tobler's Hiking Formula" (as applied by White 2015) is thus the most suitable for modelling the most efficient routes for ancient wheeled traffic.

Using this function, least cost paths were first calculated between the urban centres in the region.[575] The results in the northern and western part of the region often correlate closely with the surviving bridges or wheel-ruts (as indicated by **figure 102**), demonstrating that the calculated routes were indeed in use during antiquity.[576] However, remains of ancient roads are by no means limited to the calculated least cost paths. This

[573] Πίκουλας 1995, 112–5. 122–3; Tausend 2006, 91–2.
[574] In the second case, the original "Tobler's Hiking Formula" was not applied correctly, resulting in a route that underestimates the importance of the slope. For this common mistake in the application of "Tobler's Hiking Formula", see Herzog and Posluschny 2011, 240; Herzog 2014, 232; White 2015, 408–9.
[575] Argos, Epidauros, Halieis, Hermion, Kleonai, Troizen (within the area of study), Alea, Corinth, Mantineia, Orchomenos, Pheneos, Phleious, Sparta, Stymphalos, Tegea and Tenea (outside the area of study).
[576] In the eastern part of the regions, where wheel-ruts are rare or seldom recorded, any possible correlation between the least cost paths and the actual routes used in antiquity eludes us.

indicates that the "road network" of the ancient Argolid was not exclusively constructed to facilitate movement of goods, people or military forces between the centres of ancient city-states.

To investigate those remains of ancient roads that do not lie on the routes between urban centres, least cost paths between urban centres and fortified settlements were added to the map (**figure 103**). Many of these new routes — especially in the eastern and northern part of the region — partially follow the same course as the least cost paths between urban centres, indicating that wheeled traffic along these routes may also have served second-order settlements.

Focusing on the routes that do not coincide with the least cost paths between urban centres, some correlate with surviving wheel-ruts, while others — especially on the Akte and in the Kynouria — so far have no parallels in the archaeological record.[577] In the Thyreatis, the Arkadian mountains and the northern Argive plain, parallels between wheel-ruts and least cost paths are particularly common, indicating that Argive fortified settlements were connected to Arkadia and Lakonia as well as Argos. This suggests that the roads between Argos and its second-order settlements should not only be seen from a military perspective, but probably also as part of a larger "civilian" network for the movement of goods and people within and beyond the Argive territory.

The least cost paths between urban centres and fortified settlements thus demonstrate the importance of second-order sites for understanding the remains of carriagable roads in the Argolid. To investigate the role of these sites further, a third set of least cost paths was calculated: the most efficient routes for wheeled transport between the different fortified settlements in the region (**figure 104**). Many of these new least cost

[577] This could be a result of the state of research or the importance of maritime routes.

paths also partially follow the previously calculated routes, suggesting that several ancient roads in the region may simultaneously have had a regional and a local function.

Comparing all three sets of least cost paths — from urban centres to urban centres, from urban centres to fortified settlements, and from fortified settlements to fortified settlements — with the archaeological record, it becomes clear that 32 out of the 85 bridges or wheel-ruts included in this study (approximately 27 %) do not correspond with any of the calculated least cost paths. There are several possible explanations. Firstly, the 32 wheel-ruts may be located along least cost paths between unfortified settlements, which could not be included in this landscape model. This would emphasise the local (rather than solely regional) importance of the roads in the Argolid.

Secondly, the archaeological remains of ancient roads may be related to settlements of earlier periods, that are similarly not considered in the present study. This could for example explain why the Mycenaean bridges near Kazarma (39) and Mykinai (51) do not correlate with the calculated least cost paths.

Thirdly, the course of ancient roads in the region could have been influenced by non-settlement sites. For example, J. Marchand has convincingly argued that many roads around Kleonai are related to local quarries or the sanctuary of Zeus at Nemea,[578] while the wheel-ruts near Kophy Rachi (42)[579] may belong to a route that provided access to the Argive Heraion.

In addition, some wheel-ruts indicate that avoiding steep slopes may have been prioritised over using the most efficient routes.[580] One example is the connection between

[578] Marchand 2009b, 10–44.
[579] Steffen and Lolling 1884, 17; Tausend 2006, 25.
[580] Studies of ancient roads usually place the critical slope of wheeled transport between 8 and 12 % (Herzog and Posluschny 2011, 240), but gradients of up to 15 % have been observed at ancient roads in Greece (Pikoulas 2007, 83). For the Roman period, wheel-ruts and harness fittings along the *Via Claudia Augusta* (leading from Altinum (Trient) to Augusta Vindelicum (Augsburg)) attest the use of animal-drawn vehicles on roads with gradients up to 30 % (Grabherr 2006, 41. 45–48. 219–20). Ancient wheeled transport was thus clearly possible along roads with

Argos and Kleonai, where the least cost path runs across the Agios Sostis pass mentioned at the beginning of this chapter, while actual wheel-ruts are only attested along the longer but less steep route through the Tretos pass.

Even though the exact course of ancient roads in the Argolid often eludes us, we can thus draw three main conclusions about the function of carriagable roads in the region. Firstly, the road network was not limited to connecting urban centres, but included numerous routes between dependent settlements and non-settlement sites within and beyond the individual political territories. As this network was very complex, access to a city-state's territory was rarely limited to a small number of easily controllable routes.

Secondly, the most efficient routes between different types of sites often overlap, so that wheel-ruts located along least cost paths between urban centres may not exclusively or even primarily be connected to long-distance movement across the region.

Thirdly, the variety of different roads demonstrates that they were not constructed exclusively for military purposes, but — as previously suggested for the roads in Attica or at Kleonai[581] — also served the "non-military" needs of urban populations and rural communities.

c) Least cost paths and ancient fortifications in the Argolid

What do these conclusions mean for the role of Late Classical and Hellenistic fortifications in the region? As mentioned above, previous scholars — especially Γ.Α. Πίκουλας and K. Tausend — have interpreted many of the Argolid's rural fortifications as military-strategic sites controlling access to and within a city-state's territory, but only

a gradient of more than 12 %. In addition, steep slopes could be overcome though the construction of switchback curves, which due to the resolution of the currently available DEMs cannot be modelled in least cost path analyses.

[581] Marchand 2009b, 43–4; Fachard and Pirisino 2015, 148.

2 of the 110 securely located fortifications in the region are located within 0.5 km of surviving extra-urban bridges or wheel-ruts (1.82 % of all sites).[582] In contrast, the correlation between fortified sites and the least cost paths seems much stronger. 53 of the 110 securely located fortifications in the region lie within 1 km of an optimal route between two urban centres (48.2 % of all sites), 44 within 1 km of an optimal route between two fortified settlements (40 % of all sites) and 64 within 1 km of an optimal route between an urban centre and a fortified settlement (58.18 % of all sites; **figure 105**).[583] At first glance, this correlation seems an important argument in favour of Γ.Α. Πίκουλας' and K. Tausend's interpretation of rural fortifications as military structures controlling movement and access to the region.

Yet on closer inspection there are several issues with this reading of the archaeological evidence. Firstly, structures that no longer survive and therefore cannot be securely identified as fortifications have the highest correlation with the least cost paths.[584] This could be an indication that archaeological remains in the vicinity of possible communication routes were in the past more readily interpreted as fortifications than structures elsewhere. As a result, the percentage of actual fortified sites within 1 km of a least cost path may be slightly (although not considerably) lower that the figures just calculated.[585]

Secondly, many sites within 1 km of a least cost path are still located at a considerable distance from this route. For example, only 29.1 % of all fortified sites fall

[582] Kazarma (39) and Tou Antreiomenou to Mnema 1 (77).
[583] These figures exclude fortified settlements that function as the starting point or destination of least cost paths.
[584] Aitolithi (130), Petrothalassa (138), Skala 2 (142), Spathovouni (143), Zogka: Asprorrema (145) and Tourkopigadou (157).
[585] If only securely identified fortifications are considered, 44.32 % of the sites lie within 1 km of a least cost path between two urban centres and 56.82 % within 1 km of a path between an urban centre and a fortified settlement (compared to 48.2 % and 58.18 % if located, but not securely identified, sites are included).

within 0.5 km of a least cost path between two urban centres. The connection between fortified sites and least cost paths may thus not be as strong as previously suggested.

Thirdly, even though many fortifications are located in the vicinity of the least cost paths, it remains unclear how they could have been used to control movement, especially since many sites could only house a very small garrison.[586] The observation that in the Argolid access to a city-state is rarely limited to a small number of easily controllable routes complicates this matter further.

Finally — and most importantly — the fact that a fortified site was built in the vicinity of a possible route does not necessarily mean that it was built to control movement. For example, both military and "civilian" sites may be located near an ancient road merely to ensure easy everyday access. Before jumping to any conclusions, it is thus necessary to identify fortifications suitable for monitoring or controlling the nearby roads, particularly those located in places where movement is confined (for example at passes or defiles) or where several least cost paths converge.

In view of the Argolid's mountainous topography, fortifications at passes or defiles are surprisingly rare. Only 12 of the 110 sites mapped for this study were built at passes or defiles (for example the towers at Gymnon (26) and Tourkovrysi (78) (**figures 106–7**)),[587] and not all of them lie near the calculated least coast paths. Consequently, only eight fortifications in the region (four towers, two forts, one drystone circuit and

[586] See section 3.2

[587] Agios Sostis (5), Anathema (8), Gymnon (26), Iliopoulaiika (30), Kastro 2 (37), Kephalovryso (40), Kophy Rachi (42), Lyrkeia (50), Sporitza (74), Tourkovrysi (78), Xylopyrgo (88) and Karya (97). The sites of Chora (111) (Tausend 2006, 159–60 after the unpublished notes of W. Wrede and K. Gebauer), Dervenakia (112) (Gauvin 1992, 136 figure 7.2. 137 figure 7.3. 138 figure 7.4) and Ellinon Lithari (113) (Gell 1810, 26; Leake 1830a, 386–7; Curtius 1852, 512; Vischer 1857, 289–90; Conze and Michaelis 1861, 22; Bursian 1872, 39; Frazer 1898, 86) reportedly also lie in the vicinity of passes, but could not be located.

one fortified settlement) were built in places where movement was confined to a particular route.[588]

In contrast, convergences between individual least cost paths are very common in the region. The overlap between different paths can be quantified using a cumulative pathway analysis, in which each individual least cost path consists of a number of raster cells. Raster cells that form the starting point or destination of a path (in this case the urban centres and fortified settlements) are assigned the value "1", while cells along a path are assigned the value "3". All individual paths are then combined into a single raster, in which the cells shared by several paths are assigned the sum of the paths' values. For example, cells shared by two paths are assigned the value "6", cells shared by three paths the value "9" and cells shared by four paths the value "12".[589] Consequently, the higher the assigned value of a particular cell, the more paths overlap and the higher the expected volume of traffic.[590]

The cumulative pathway analysis thus highlights routes that may have been particularly well frequented in antiquity (**figure 108**): the coastal route between the plain of Iria and the Thyreatis, the north-south route through the Kynouria, the route from the Argolic Gulf to Andritsa: Goulas (9), and the route through the lower Inachos valley. Probably less well frequented, but still with a considerable volume of traffic are the routes

[588] Agios Sostis (5), Anathema (8), Gymnon (26), Kastro 2 (37), Lyrkeia (50), Sporitza (74), Tourkovrysi (78) and Xylopyrgo (88).

[589] Cumulative pathway analyses have already been used to interpret survey data (for example in the *Sangro Valley Survey* (Bell et al. 2002)), but have so far not been applied to the study of ancient fortifications.

[590] Evaluating the results of this analysis, it is important to point out the limitations of using cumulative pathways to model frequency of movement. Firstly, the model is based solely on urban centres and fortified settlements and does thus not take into account movement to and from unfortified rural settlements or "special purpose sites". Secondly, the analysis does not distinguish between different settlement sizes, so that in comparison to large urban centres the movement to and from small rural settlements may be overestimated. Thirdly, the model is limited to sites in the area of study and the immediately adjoining regions, so that routes connecting the Argolid with areas further afield may have experienced a larger volume of traffic than the cumulative pathway analysis may suggest.

between the Argolic and Saronic Gulfs, between the Argive plain and the plain of Phleious and across the pass of Agios Sostis. Interestingly, rural fortifications can be found equally along these well-frequented routes and elsewhere (**figure 109**), and were not systematically placed at the "busiest" routes in the region.

Overall, 21 fortifications lie in the vicinity of these particularly well-frequented routes,[591] while four sites — Choutalaiika (18), Gymnon (26), Tourkovrysi (78) and Vigliza (85) — are located at the crossroads of two or more least cost paths. Four of these sites — Agios Sostis (5), Gymnon (26), Tourkovrysi (78) and Xylopyrgo (88) — at the same time occupy a position on a pass or defile, and would thus be ideally placed to monitor the nearby route.

Interestingly, there appears to be some correlation between volume of traffic and type of fortification. Forts tend to be located on "busy" routes, while drystone circuits — weaker but also more cost-efficient — are more common along less frequented least cost paths.[592] Furthermore, five of the six surviving free-standing circular towers — Agios Sostis (5), Choutalaiika (18), Nera (53), Prosilia (66) and Xylopyrgo (88) (**figure 110**) — are located along least cost paths. All six were built in border areas,[593] which together with their often strategic location suggests that in the Argolid this type of fortification may be specific to military sites.

A second group of towers that stands out are the freestanding rectangular towers with chamfered corners at Lileika Xeropigadou (47), Kephalovryso (40) and Tourniki:

[591] Agios Sostis (5), Choutalaiika (18), Iria (31), Kantia 1 (33), Kantia 2 (34), Kastraki (35), Kazarma (39), Lampagiana (45), Levkakia (46), Lileika Xeropigadou (47), Phranchthi (62), Pyrgouli (71), Tourkovrysi (78), Vigla (84), Xylopyrgo (88), Kondyli (98), Malantrenion (101), Skala 2 (142), Xydeika (106) and Tourkopigadou (157).

[592] There are, however, exceptions, such as the fort of Ano Phanari (10) or the drystone circuits of Phranchthi (62) and Vigla (84). For the cost of ancient drystone circuits, see section 7.2.

[593] For the Late Classical and Hellenistic borders in the region, see section 5.1. The sixth tower, Limanaki 1 (48), probably lies near the boundary between Troizen and Arsinoe. A further round tower, which was recorded in 1979 at Porto Ydra (140), but has since been destroyed, is located near the border between Hermion and Troizen (McAllister 1969, 185; Jameson et al. 1994, 537).

Gaidourovouni (79) (**figure 111**). All three of them were erected in locations with strategic potential: Kephalovryso (40) lies immediately above a pass (even though none of the calculated paths lead along this particular route), Lileika Xeropigadou (47) was built on the busy coastal route from the Argive plain to the Kynouria, and Tourniki: Gaidourovouni (79) was identified as one of the few sites that could have been used to transmit optical signals to Argos. This may suggest that like their circular counterparts, freestanding rectangular towers with chamfered corners were used particularly or exclusively as military structures.

To sum up the results of the investigation so far: judging by wheel-ruts on the well-documented road between Argos and Mantineia, cost surfaces generated with the so-called "Tobler's Hiking Formula" are most suited to modelling efficient carriageable routes between different settlements in the Argolid. Comparing this model to known archaeological remains demonstrates that the road network in the region was limited neither to a single function (for example the movement of troops) nor to a few principal arteries connecting major urban centres. The network's complexity furthermore means that most city-states were accessible by several alternative routes.

Using this model, four sites — Agios Sostis (5), Gymnon (26), Tourkovrysi (78) and Xylopyrgo (88) — can be identified as likely candidates for fortifications controlling nearby routes. In addition, the comparison between calculated routes, territorial borders and site distributions suggests that two types of structure — circular towers and rectangular towers with chamfered corners — were built solely or at least predominantly for military purposes, although they are not necessarily associated with nearby routes. In total, eight sites can thus be tentatively identified as military-strategic fortifications.

But how about fortifications that are located on passes or well-frequented routes, but could so far not be singled out as military-strategic sites? This group comprises 21

structures,[594] but two of them (the "tower" at Tourkopigadou (157) and the "fortified settlement" at Skala 2 (142)) no longer survive and were possibly not fortified structures in the first place,[595] while a third (the fortified settlement at Kantia 1 (33)) may not have been occupied during the Classical and Hellenistic periods.[596] This limits the list of fortifications yet to be examined to just 18 sites.

These sites differ considerably in term of visibility. While most fortifications command good views, the possible tower at Kondyli (98) and the drystone circuit at Vigliza (85) offer no or only very limited possibilities for observing nearby routes (**figures 112–3**). This suggests that they were not constructed to monitor or restrict movement. A similar situation presents itself at Kantia 2[597] where the nearby road only becomes visible once it emerges onto the plain. All three fortifications — Kondyli (98), Vigliza (85) and Kantia 2 (34) — are thus unlikely to be strategic-military sites built specifically to control or monitor movement.

A further characteristic that may help to evaluate the role of the remaining 15 sites is their accessibility. The forts of Iria (31) and Kastraki (35) are located nearly 1 km

[594] The group includes three possible or securely identified fortified settlements (Kantia 1 (33), Sporitza (74) and Skala 2 (142)), six forts (Anathema (8), Gyphtokastro (27), Iria (31), Kastraki (35), Kazarma (39) and Lyrkeia (50)), eight possible or securely identified towers (Kantia 2 (34), Lampagiana (45), Levkakia (46), Pyrgouli (71), Kondyli (98), Malantrenion (101), Xydeika (106) and Tourkopigadou (157)) and four drystone circuits (Kastro 2 (37), Phranchthi (62), Vigla (84) and Vigliza (85)).

[595] At Tourkopigadou (157), Russell 1924, 44 and Meyer 1941, 280 noted a square structure ca. 9 m wide, but today no blocks are visible *in situ* (Πίκουλας 1995, 233). The structure may have been a fortification (Russell 1924, 44; Gauvin 1992, 142; Πίκουλας 1995, 233) or a *villa rustica* (Πίκουλας 1995, 233). The surface pottery from the site appears to support the latter view (Cloke 2016, 818). At Skala 2 (142), surface sherds attest a use of the site in Prehistoric, Hellenistic, Roman, Byzantine and modern times (Pritchett 1980, 15; Πίκουλας 1995, 189), but of the structure itself only few blocks incorporated into a Medieval tower survive.

[596] On the date of the settlement, see Gebauer 1939, 292–3. The finds include Geometric, Archaic, Hellenistic and Byzantine sherds, as well as Hellenistic tile and fragments of obsidian (Gebauer 1939, 288–92; Brommer 1975, 172; Πιτερός 1995a, 111; Simpson and Hagel 2006, 40). Gebauer 1939, 291–2 suggested that the circular tower inside the circuit was reused in the Early Roman period, but the evidence for this hypothesis remains unclear.

[597] In 1939, Gebauer 1939, 293–4 excavated two towers at this site, as well as remains of a further building. Today, the site is very overgrown and only the east tower is visible.

from the nearest route, while Gyphtokastro (27) is separated from the nearest least cost path by a steep and inaccessible slope, preventing any effective or reliable control of movement.

Taking the two additional factors of visibility and access into account, the results of this section can be summarised as follows. Many of the 110 Late Classical and Hellenistic fortifications in the Argolid lie close to the most efficient routes through the region, but only a few are strategically placed to control movement. By looking in detail at the relationship of the sites, the calculated routes and the surrounding topography, only nine structures can with any confidence be identified as military-strategic fortifications, and a mere five structures — Agios Sostis (5) (**figure 98 and 110a**), Gymnon (26) (**figures 106 and 114**), Lileika Xeropigadou (47) (**figure 111b**), Tourkovrysi (78) (**figures 107 and 115**) and Xylopyrgo (88) (**figure 110f**) — are well situated for monitoring, controlling or restricting movement along optimal routes through the region. Although several of them are located near the Argive borders, there is no evidence that Argos systematically constructed fortifications to restrict access to its territorial heartland.

Furthermore, none of the five towers could have housed a garrison sufficient to hold a pass or defile against a large invading army for any amount of time. To take one example, the tower at Tourkovrysi (78) is located at the point where the route between the plains of Argos and Phleious passes through a valley just over 200 m wide (**figures 115–6**).[598] Even so, the southwest side of the defile lies beyond the effective range of hand-thrown javelins (30–40 m),[599] slingshots (65–100 m, depending on the material)[600]

[598] The area around the tower is today dominated by the highway between the Isthmus and Tripoli, but aerial photographs taken in 1944 demonstrate that the construction of the highway did not involve widening the valley.
[599] Lawrence 1979, 40.
[600] Baatz 1990, 66.

or arrows (50–175 m)[601] fired from the tower (**figure 116**). Blocking the defile with sustained fire from manual weapons was thus not an option. Catapults (once invented and widespread) were able to reach further,[602] but with exterior measurements of just 6 by 6.15 m, the tower at Tourkovrysi (78) could either house a single 10-minai stone-throwing *palintone*, or up to two large arrow-shooting *euthyones* or several smaller arrow-shooting *euthyones* per storey[603] — hardly a battery sufficient to stop a substantial army. Assuming therefore (for the sake of argument) that the aim of the force stationed at the tower was to block the defile, over 400 men would for example be needed to stretch across the defile in a single-rank, close-order phalanx.[604] Even leaving aside the fact that single-rank phalanges are only rarely attested,[605] this force by far exceeds the number of men that could be stationed in a tower measuring a mere 6 by 6.15 m. Holding up an army at this defile with one tower therefore appears to have been impossible.

Before concluding that fortifications like the tower of Tourkovrysi (78) had no place in "large-scale", inter-state warfare, one further scenario must be explored. Once a hostile army had been spotted, the tower's garrison may have been able to alert reinforcements at nearby forts or fortified settlements by signal or messenger, giving them sufficient warning to reach the defile before the approaching enemy. However, none of the five sites under consideration commands a view that is sufficient to give a hypothetical nearby garrison enough time to reach the pass or defile before the enemy. This demonstrates that the five towers were not aimed at preventing large field armies from entering the Argive territory, but were rather concerned with monitoring, controlling and if necessary restricting the movement of civilian travellers or small forces

[601] McLeod 1965, 8.
[602] For the range of 10-minai catapults, see Rossi 2012.
[603] For the dimensions of ancient catapults, see section 4.4.
[604] On the interval between men in a hoplite phalanx, see Matthew 2012, 179–96.
[605] The only known example is the Spartan phalanx at Dipaia in 471 BC, mentioned in Isoc. 6.99 (Matthew 2012, 175–6).

such as raiding parties. This is an important conclusion, which needs to be investigated further in the following chapter, when we explore the role of Late Classical and Hellenistic rural fortifications in securing and protecting border regions in the Argolid.

6.3 Territories: fortifications and defensive strategies

6.3.1 Late Classical and Hellenistic strategies of territorial defence

How did city-states in the Late Classical and Hellenistic Argolid protect their rural territories? The conclusions drawn in this chapter so far are oddly paradoxical. Rural fortifications in the Argolid are often intervisible, but rarely form visual networks; they are often located on major routes, but do not systematically control movement through the region. In short, the study has so far mainly succeeded in excluding possible interpretations rather than identifying specific site functions. These results raise an important issue for the remaining part of this chapter: are the functions of rural fortifications in the Argolid really elusive, or have we so far merely asked the "wrong" questions?

In order to address this issue, the analysis in this section will shift towards a more integrated and multifaceted approach. Instead of using specific aspects of rural fortifications (e.g. "visibility") to identify "defensive networks", this new approach will combine different site characteristics (e.g. size, location, defensibility and construction technique) to explore how individual sites could have functioned as territorial defences.

But first it is necessary to clarify what types of "territorial defences" we could expect in a Late Classical or Hellenistic city-state. One of the most influential works on ancient territorial defences is J. Ober's "*Fortress Attica. Defense of the Athenian land*

frontier, 404–322 B.C.", a study that has been criticised as vehemently by some[606] as it has been embraced by others.[607] Regardless of whether we accept J. Ober's final conclusions, "*Fortress Attica*" provides a good overview of the main five defensive strategies attested in Greek antiquity: firstly, deterring an enemy from making an attack; secondly, stopping an enemy before the border; thirdly, meeting an enemy at the border; fourth, resisting an enemy within the defenders' own territory; and, lastly, withdrawing into a fortified urban centre.[608]

For the Argolid, Late Classical and Hellenistic literary or epigraphic references to defensive strategies are very rare,[609] and are in fact entirely lacking for Hermion and Troizen.[610] For Epidauros, some sources do exist, although mainly from the late 5th century BC rather than the period under discussion in this study. They mention a defensive battle fought outside the Epidaurian territory,[611] ambushes and raids within the Epidaurian territory[612] and attacks on the urban centre itself,[613] but nowhere do we learn of Epidaurian border defences.

[606] For example Muller 1986, 347–9; Harding 1988, 61–71; 1990, 377–80; Munn 1993, 3–33; Lohmann 1995, 518; Muller 1999, 25; Fachard 2012, 130–33. 263–292; Daly 2015, 26–35; Fachard 2016, 209.
[607] Following the publication of "*Fortress Attica*", numerous defensive networks were "discovered" in Central Greece and the Peloponnese, for example in Boiotia (Fossey 1992, 112–22), Phokis (Fossey 1986, 135–41; 1992, 122–3), Opountian Lokris (Fossey 1990, 139–50; 1992, 123–8), the Megarid (Maele 1982; 1992), and at Phleious and Kleonai (Gauvin 1992), even though J. Ober's hypothesis is based specifically on the political situation in Athens after 404 BC and therefore cannot simply be applied to other regions.
[608] Ober 1985, 70.
[609] The sources include Xenophon for the 4th century BC and Polybius for the late 3rd century BC, as well as Thucydides for the late 5th century BC.
[610] Thuc. 2.56. 4.45 and Polyb. 2.52 provide the best literary evidence for the cities' involvement in inter-state warfare, but make no mention of defensive strategies.
[611] Thuc. 1.104.
[612] Thuc. 5.56.
[613] Thuc. 2.56. 5.56. 5.75.

This brings us to Argos, where the more extensive written record reveals that meeting an enemy beyond the borders,[614] engaging in conflict on Argive soil[615] and withdrawing to the urban centre[616] were regarded as viable defensive strategies. A particularly intriguing narrative relates to the Spartan invasion under Agesipolis in 388 BC. According to Xenophon, Agesipolis' army moved against Argos from the plain of Phleious, but when the Argives realised that they would not be able to halt the Spartan advance, they sent two heralds claiming a holy truce, which Agesipolis refused to honour.[617] For the present study, it is of interest that the Argives had apparently planned to stop the enemy during the advance through the border region. This tactic clearly contrasts with the commonly attested strategy of withdrawing into an urban fortification, and at first glance appears to be an attempt to bring the enemy to a halt at a territorial border. However, on closer inspection the passage does not contain sufficient detail to decide whether the Argives had originally planned to intercept the Spartans within the territory of Phleious, on the border, or within the Argive territory.

To sum up the written evidence, border defences in the strictest sense are not attested for a single city-state in the area of study. This could, however, easily be explained by the focus and fragmentary survival of the textual sources. It is therefore necessary to turn to the archaeological record and examine whether the ancient fortifications themselves reveal any preferences for particular defensive strategies.

[614] Xen. *Hell.* 4.2.11–3 (394 BC). For a failed 5th-century BC attempt to stop an enemy before it reached the border, see Thuc. 5.58 (418 BC).
[615] For 5th-century BC examples of actual or potential conflict within the Argive territory, see Thuc. 5.47 / *IG* I^3 86 (420 BC); Thuc. 5.59 (418 BC). 75 (418 BC). 6.7 (416/5 BC).
[616] Thuc. 5.82 (417 BC) and Polyb. 2.64 (222 BC). See also Polyb. 4.36 (219 BC) for the role of fortified settlements in the Kynouria.
[617] Xen. *Hell.* 4.7.3.

6.3.2 Fortifications as "deterrents" and the role of city walls

Among the five defensive strategies outlined in "*Fortress Attica*", the first (military deterrence) is particularly difficult to recognise in the archaeological record, since it either relies on demonstrating the ability to strike back in case of attack ("retaliatory deterrence") or on ensuring that the cost of an attack would outweigh any economic gains.[618] Urban fortifications may have played a part in such strategies,[619] but comparing the chronology of the Argolid's surviving city walls with the dates of known military incursions shows that they did not have a universal or lasting effect. For example, the urban defences of Argos were significantly strengthened in the late 4th or early 3rd century BC (between 330/25 and 290 BC),[620] but apparently this did not dissuade Pyrrhus from attempting to take the city in 272 BC.[621]

The remaining four strategies can be divided into "dynamic" defences (stopping enemies before they reach the borders, meeting enemies at the borders, and resisting enemies within the borders) and "static" defences (abandoning the countryside and withdrawing behind city walls). As discussed above, "static" defences are common in written sources, while archaeologically, we can see a sharp increase in the size and number of urban fortifications during the 4th century BC and the Hellenistic period. This development is particularly marked in the period around and after 300 BC, when city walls are built or rebuilt at Argos (12), Epidauros (Palaia Epidavros 1 (54)), Hermion (Ermioni (24)) and Troizen (Troizina (80)).[622]

[618] Ober 1985, 71–2. For an example of retaliatory deterrence, see Xen. *Vect.* 4.47, for deterrence based on economic gain, see Arist. *Ath.* 2.1267a.
[619] Lawrence 1979, 113.
[620] For the date of the walls on the Aspis, see Fachard and Bessac (forthcoming).
[621] Plut. *Pyrrh.* 31–4.
[622] Halieis, which was abandoned in the early 3rd century BC, experienced its final phase of defensive building activity in the early 4th century BC (McAllister 2005, 82–3).

Thanks to the work of the French School at Athens, the city walls of Argos (12) include some of the best-studied fortifications in the region. The walls consist of a circuit around the lower town (**figure 117**), an upper acropolis on the Larissa (**figure 118**) and a lower acropolis on the Aspis (**figure 119**), where recent excavations revealed three 4th-century BC or Hellenistic building phases (the construction of an impressive triangular bastion between 330/25 and 290 BC and two phases of repairs and remodelling in the 4th century BC and around 200 BC).[623] The construction date of the walls around the Larissa and the lower city is less clear, but if the chronology proposed in chapter 4 is correct, the polygonal walls of the outer Larissa circuit and the hexagonal tower between the two acropoleis were not built before the 4th century BC. The circuit around the lower city is difficult to date, but possibly belongs to the 3rd century BC.[624]

Both in terms of size and complexity, the urban fortifications of Argos (12) by far outstrip their neighbours on the Akte. While the fortifications at Argos (12) enclose an area of ca. 100 ha,[625] the 4th-century BC and Hellenistic circuits at Ermioni (24) (**figure 120**), Palaia Epidavros 1 (54) (**figure 121**) and Porto Cheli (64) (**figure 122**)

[623] Fachard and Bessac (forthcoming).
[624] Διβάρη-Βαλάκου 1980, 111.
[625] The course and size of Argos' city walls (12) have been a matter of some debate. The walls are still visible between the Larissa and the Aspis (Salviat 1956, 366; Schilbach 1975, 7; Darcque 1980, 128; Piérart et al. 1981, 912–7; Πιτερός 2013, 341), but the eastern part of the circuit lies beneath the modern town and is therefore difficult to reconstruct. Πιτερός 2013, 341–5 suggested that the city walls ran from the southwest corner of the outer Larissa circuit to the southeast side of the Larissa hill, along the west and south side of the modern cemetery at the foot of the Larissa and along the modern Οδός Τριπόλεως, before turning east, north and northeast, and finally joining the wall between the Larissa and Aspis. In contrast, Marchetti 2013, 320–4 proposed two separate circuits, arguing that two clusters of Hellenistic settlement can be distinguished. He rightly pointed out that the east wall of the city ran further west than Πιτερός 2013 suggested, but on closer inspection the Hellenistic tombs and settlement remains do not form clearly defined clusters (for a map of the remains see Marchetti 2013, 332 figure 3). Unless further support for Marchetti's hypothesis comes to light, a single circuit therefore seems more plausible.

measure a mere 17 to 20 ha.[626] Even the walls at Troizina (80) (**figure 123**) only fortify an area of ca. 50 ha.[627]

A key question for understanding these city walls is whether they were primarily military-strategic or urbanistic-symbolic structures.[628] Starting with a brief comparison of the curtain walls, the fortifications at Argos (12), Porto Cheli (64), Ermioni (24) and Troizina (80) combine sections in different construction techniques and masonry styles. These differences not only correlate to specific building phases, but also demonstrate defensive priorities. For example, the walls at Argos (12) are usually constructed in mudbrick on a stone socle, with the exception of the weakest part of the outer Larissa circuit, which was built entirely in stone (**figure 124**). Similarly, the curtain walls at Ermioni (24) were constructed in carefully fitted masonry on the accessible north side of the Bisti peninsula, while the blocks on the naturally protected south side are only roughly hewn (**figures 125 a–b**). However, unusually elaborate walls in strategically negligible locations, which could point to a concern beyond defensibility,[629] have so far not been identified.

Along the curtain walls, towers and bastions were placed at strategic locations, for example on the weaker north side of Ermioni's Bisti peninsula (24). At Argos (12),

[626] For the Hellenistic date of the circuit at Palaia Epidavros 1 (54), see chapter 4. An earlier city wall (mentioned by Thuc. 5.56.5) has so far not been identified. For the 4th-century BC date of the final building phase at Porto Cheli (64), see McAllister 2005, 82–3; on the size of the circuit, see McAllister 2005, 15. For the Hellenistic date of the walls at Ermioni (24), see chapter 4. At Ermioni (24), the reconstruction of the circuit depends on the interpretation of three trapezoidal walls on the Pron Hill. While Frickenhaus and Müller 1911, 35–7 saw them as the foundations of the temple of Demeter Chthonia and the Echo Stoa (mentioned by Paus. 2.35.4–10), Jameson et al. 1994, 586. 593 suggested an interpretation as city walls or *temenos*.

[627] The circuit at Troizina (80) is usually attributed to the 3rd century BC (Welter 1941, 12; Maier 1959, 139–44; Φαράκλας 1972b, 42; Sokolicek 2009, 132) and was divided by an east-west *diateichisma* in 146 BC. For the date of the *diateichisma*, see chapter 4.

[628] Jansen 2016 recently suggested new guidelines for identifying the military functions of ancient city walls, while Müth et al. 2016 collected the characteristics of fortified structures built primarily for symbolic or urbanistic effect. Together, these two articles form a framework for assessing the function of city walls in the Argolid, even though a detailed analysis would be beyond the scope of the current chapter.

[629] Müth et al. 2016, 154–5.

several towers have been identified along the lower city walls, including at the southwest and south gates (**figure 117 a and c**),[630] where they could have fulfilled a strategic function as well as creating an imposing approach to the city.[631]

Moving to Argos' better-known acropoleis, most towers on the Larissa face away from the lower town, with the exception of one tower on the east side of the outer circuit. This tower emphasises the Larissa's role as a fortified stronghold within the city.[632] The Aspis is similarly fortified both towards the town and the area outside the city walls (**figure 119**).[633] Another example of an intra-mural fortified stronghold is the mid 2nd-century BC *diateichisma* at Troizina (80) (**figure 123**). This wall was previously thought to have been built after the abandonment of the Troizenian acropolis,[634] but a re-examination during the "*Troizen Archaeology Project*" has convincingly shown that the *diateichisma* faced the "lower city" and thus created a separate defensible area on the acropolis slope.[635]

Gates and posterns are another important element for understanding the function of ancient city walls. As noted above, the gate-towers at Argos (12) create an impressive approach, but as far as we know, none of the main entranceways to Argos (or any other city in the region) were embellished at the expense of military functionality.[636] Smaller

[630] Πιτερός 1998a, 186–7; 2013, 342.
[631] The walls at Porto Cheli (64) (where only the prominent north, east and southeast defences were remodelled with round towers in the 4th century BC (McAllister 2005, 82–3)) could be another example of combining strategic functionality with a visual effect.
[632] For the towers of the outer Larissa circuit, see Andrews 1953, 112; Schilbach 1975, 10; Πιτερός 2013, 341.
[633] See, for example, the hexagonal "Tower Y" on the east side of the hill. Antigonos' garrison, which held Argos until 280/79 BC, may have been stationed on the Aspis (Fachard and Bessac (forthcoming)).
[634] Welter 1941, 12–3; Sokolicek 2009, 132.
[635] Fouquet 2015, 125. The argument is based on the presence of a small tower covering the postern in the north face of the "Frankish Tower".
[636] At Porto Cheli (64), the Harbour Gate was reduced in width during its final building phase (McAllister 2005, 40), suggesting a concern with defensibility rather than display.

posterns have so far been identified at Porto Cheli (64),[637] Troizina (80)[638] and on the Aspis (12),[639] but seem to have had a military rather than an exclusively civic function.[640]

Taking these architectural features together, they suggest that the urban fortifications in the Argolid had a very strong practical defensive character and that the desire to create a deliberate impression did not compromise their military functionality. Consequently, withdrawal to the urban centre was a viable tactic for all five city-states, either as initial defensive strategy or — as Aeneas the Tactician suggests[641] — as a last resort.

6.3.3 "Dynamic" defences: the role of rural fortifications

a) Studying "dynamic" defences: five criteria

Turning to the three dynamic defensive strategies (confronting an enemy before, at or within the borders), they all share two characteristics: the emphasis on movement and the importance of territorial boundaries for delineating the space of action. Both aspects make them archaeologically difficult to trace, especially since none of the strategies necessarily requires fortifications. All three defensive tactics might thus be archaeologically invisible. Nevertheless, five site characteristics might help us to understand individual fortified sites in their defensive context: the size of a fortified structure, its location within the surrounding region or microregion, its defensibility (including its water supply), its construction technique, and its surface material.

[637] McAllister 2005, 31–2.
[638] Legrand 1905, 277; Fouquet 2015, 125.
[639] Fachard and Bessac (forthcoming).
[640] The postern at Troizina (80) is covered by a small tower to the east, while the posterns on the Aspis form part of the triangular bastion. On the use of posterns in general, see Winter 1971, 234–51; Lawrence 1979, 335–42; Jansen 2016, 121–2.
[641] Aen. Tac. 16. 18–9.

b) Criterion 1: size

Beginning with the first characteristic, we have already noted in section 3.2 that rural forts in the Argolid were surprisingly small, probably with garrisons between 12 and 40 men,[642] except for some "outliers" like the small forts of Anathema (8) and Iria (31) or the exceptionally large site of Ano Phanari (10). Rural towers may have housed even smaller troop contingents. The garrisons of most rural sites were therefore too small to have a direct impact in Late Classical and Hellenistic "large-scale" conflict, but— like the περίπολοι and κρύπτοι in 5th-, 4th- and 3rd century BC Athens[643] — were probably stationed in the countryside to prevent "small-scale" conflict and raiding by brigands, pirates, or neighbouring city-states.[644]

But there may be two exceptions to this general rule. Firstly, Aeneas the Tactician suggests that a defending city should occupy strategic positions within its territory to impede an enemy's approach, taking advantage of the defenders' superior knowledge of the terrain and its resources.[645] Although Aeneas does not explicitly mention built structures, such a defensive strategy could have involved rural fortifications which had to be taken by any invading army in order to secure its retreat routes. Alternatively, defenders based at rural fortifications could harass approaching enemies with small troop contingents and thus prevent plundering and looting, which was essential for supplying an army on the march.[646] Judging from their size, rural fortified settlements, larger forts,

[642] See for example Galatas: Megali Magoula (25) (0.1 ha or 12 men), Agios Adrianos (3) (0.14 ha or 16 men), Kastraki (35) (0.34 ha or 40 men) or Kazarma (39) (0.35 ha or 40 men).
[643] For the περίπολοι, see for example Thuc. 3.99. 4.67.2. 6.45.2. 7.48.5; Xen. *Vect.* 4.43–48, for the κρύπτοι *SEG* xli 87 (after 235/4 BC); *SEG* xlix 59 (264/3 BC). Eupolis fr. 340 (*PCG*) mentions the περίπολοι in connection with rural forts (φρούρια), Xenophon in connection with cavalry (Gomme 1945, 529; Knoepfler 1993; Taylor 1997, 235–7; Πετράκος 1999, 6–9. 26–28; Chaniotis 2005, 51; Couvenhes 2011, 296–303).
[644] Hanson 1998, 92; Ma 2000, 342–3; Chaniotis 2008, 127–31; Fachard 2012, 275–85; 2016a, 225–6. For raids by pirates and brigands, see Pritchett 1991b, 312–352.
[645] Aen. Tact. 16.16–9.
[646] McCredie 1966, 88–89; Hanson 1998, 92. 122. On the provision of ancient armies, including foraging, see Pritchett 1974, 30–52; Hanson 1998, 33–4.

and perhaps even drystone circuits could be used in such a defensive strategy,[647] but since they needed to withstand a large invading army, their defensibility must be explored before drawing any conclusion.

The second way in which comparatively small rural fortifications could have been involved in "large-scale" warfare is as ἐπιτειχίσματα (temporary "offensive" fortifications built or occupied by an invading army within the defenders' territory). Since one of the main characteristics of these sites is their building technique, they will be discussed in more detail below.

c) Criterion 2: location

Moving on from the fortifications' size, one of the main features that distinguishes the three "dynamic" defensive strategies is the role of territorial borders. Whereas the first defensive strategy takes place beyond the borders, the second and third are played out respectively at territorial boundaries and within the defenders' territory. The relationship between fortifications and borders is thus crucial for investigating possible defensive strategies with the help of the archaeological record. In this context, "borders" do not necessarily have to be land boundaries. For example, after the independence of Kalaureia (late 4th century BC) and Methana (3rd century BC) the Troizenian coastline effectively became a border region.[648]

Along this "maritime border" safe anchorages are mainly limited to the straits of Poros and the small bay of Phourkaria.[649] Interestingly most Troizenian rural fortifications are concentrated in these two areas and command good views towards the

[647] Smaller fortifications (towers, forts or drystone circuits garrisoned by fewer than 15 men) would probably not present a sufficient threat to an invading army. We can thus exclude the following forts and drystone circuits: Agio Lias (2) (0.05 ha), Anathema (8) (0.03 ha), Galatas: Megali Magoula (25) (0.1 ha), Iria (31) (0.03 ha), Soros (72) (0.05 ha) and Vigla (84) (0.05 ha).
[648] For the end of the Troizenian control over Poros and Methana, see section 5.1.
[649] Another possible anchorage is located at Cape Skyllaion. This information is based on modern pilot charts. For coastline changes since the Hellenistic period, see section 2.2.

sea (**figure 126**) — a pattern that is surely no coincidence and calls for an explanation. Larger coastal fortifications like Galatas: Megali Magoula (25) and Phourkaria (61) could have housed garrisons to protect the surrounding countryside from attacks by sea,[650] while the towers at Limanaki (48 and 99) may have served as lookout posts over the straits of Poros,[651] relaying information to naval forces stationed at Pogon.[652] The level of military presence at Limanaki (48 and 99) and Phourkaria (61) is unclear,[653] but Galatas: Megali Magoula (25) has been clearly identified as a fort.[654] Established in the Late Classical period,[655] it falls either shortly before or during the period in which Kalaureia became independent, a time of instability for Troizen when opportunistic seaborne raids may have been particularly common.[656]

Given the connection between fortifications and landing places at Troizen, it is very tempting to look for similar patterns in the rural Epidauria, especially at the already mentioned coastal fort of Ano Phanari (10) and the neighbouring tower of Ano Phanari: Vigliza (11). In 1938, K. Gebauer noted a small harbour on the steep and rocky coast north of the two sites,[657] but even assuming that this anchorage already existed in

[650] Such attacks are for example attested in the late 5th century BC (Thuc. 4.4.4).
[651] Γιαννοπούλου 2009, 534.
[652] The existence of a Troizenian fleet is well attested, for example in 369 BC (Xen. *Hell.* 6.2.4). On the harbour of Pogon, see Hdt. 8.42; Str. 8.6.14 (Meyer 1939a, 635–6; Welter 1941, 5; Φαράκλας 1972b, 24. Ε 2: 1; Γιαννοπούλου 2009, 533). The harbour has so far not been located and probably lies hidden under later sediment.
[653] At Limanaki 1 (48) the circular layout may suggest a primarily military function (see section 6.2), but at Phourkaria (61) the finds include objects characteristic of fortified settlements rather than purely military sites, for example a loomweight (Brommer 1975, 178) and fragments of a partially fluted trachyte column.
[654] Κονσολάκη-Γιαννοπούλου 2003, 162; 2009, 506; Konsolaki-Yiannopoulou 2010, 69.
[655] Κονσολάκη-Γιαννοπούλου 2003, 162–4; 2009, 506; Konsolaki-Yiannopoulou 2010, 69.
[656] Troizen faced a number of challenges during the 4th century BC. For example, the city was ravaged by Epameinondas in 369 BC (D. S. 15.69.1) and took part in the Lamian War on the Athenian side (D. S. 18.11.2; for the military history of Troizen during this period, see Welter 1941, 56–7; Piérart 2004, 616). In addition, it probably experienced a period of internal *stasis* after the battle of Chaironeia (Welter 1941, 56–7; Whitehead 2000, 340–1; Piérart 2004, 616).
[657] The tower of Ano Phanari: Vigliza (11) and the nearby harbour are briefly mentioned in an unpublished report, now in the archive of the German Archaeological Institute at Athens.

antiquity,[658] the tower at Ano Phanari: Vigliza (11) can be ruled out as a garrison fort protecting the surrounding countryside on the grounds of its small size. However, the neighbouring site of Ano Phanari (10) is not only one of the largest forts in the region, but is also located near modern agricultural areas as well as the main pass connecting the coast with the Benteni valley (**figure 127**). A garrison stationed at the site could thus have fulfilled the double function of repulsing raids on the immediately-surrounding coastal area and preventing small- and medium-sized raiding parties from crossing into the Epidaurian hinterland.

On the Argolic side of the Epidaurian territory connections between fortifications and landing places are more difficult to trace, mainly because sea-level changes and sediment deposition have considerably altered the coastline since antiquity. But even if all four Late Classical and Hellenistic fortifications on this coast originally lay closer to the sea than they do today, none of the sites is ideally placed to observe nearby sea routes or the approach to landing places. For example, a vessel approaching Kantia 1 and 2 (33–4) (or Iria (31)) from the direction of the neighbouring and often hostile Argos would only become visible after rounding the headland at the western edge of the plain of Kantia (or the northern end of the plain of Iria). The location thus makes a strong case against identifying the four sites as military bases orientated towards the sea.

Moving inland, any attempt to identify Epidauros' prevalent defensive strategies solely through borders that appear in written sources quickly reaches its limits. For example, the course of the northern Epidaurian-Argive boundary is virtually unknown,[659] calling for an alternative approach to investigating the location of rural fortifications in the wider region. One possibility is to turn to the second aspect that all three "dynamic"

[658] For sea level changes in the Saronic Gulf, see section 2.2.
[659] See section 5.1.

defensive strategies have in common: the emphasis on movement. But how can we investigate movement in an archaeological landscape?

A first possibility — investigating movement through routes — was already explored in section 6.2, but the number of sites that could be identified as strategic-military fortifications, let alone be connected to a specific defensive strategy, is very small. This means that further investigation needs to shift from focusing on specific routes to exploring the wider spatial relationship between the urban centres and rural fortifications. Simple analyses of "site catchment areas" — for example the "Thiessen polygons" commonly used in landscape archaeology from the 1970s onwards — are a useful step towards visualising spatial relationships between sites,[660] but have the major drawback that they are based on Euclidian distances and therefore do not take into account the underlying terrain.[661]

Cost-based methods of modelling "catchment areas" are to some extent a response to this issue, and are aimed at analysing the spatial relationship between different sites while integrating the parameters of the local topography.[662] As in the case of the least cost paths discussed in the previous section, cost surfaces can be based on various algorithms,[663] and differ significantly depending on the underlying model. It is therefore important to choose an algorithm appropriate to the particular research question.

For the current research, which investigates movement in a military context, travel times are a key factor. The following analysis is therefore based on "Tobler's

[660] On Thiessen polygons, see, for example, Hodder and Hassall 1971; Renfrew 1976; Cherry 1987; for their application in Greek archaeological landscapes, see Decourt 1990; Bintliff 1994; 1999; Alexakis et al. 2011.
[661] On the problems of basing distances and catchment areas on Euclidian distances, see for example Leusen 2002, 6, 4–5; Wheatley 2002, 149–151; Fachard 2017a, 199.
[662] For three examples of cost-based territorial modelling, see Posluschny 2010; Farinetti 2011; Posluschny et al. 2012; Fachard 2017a.
[663] See for example Wheatley 2002, 151–59; Conolly 2006, 215–24; Posluschny 2010, 314.

Hiking Formula" discussed above, which describes the relationship between slope and walking time assuming an average walking speed around 5 km/h on level ground [664] However, there are two caveats. Firstly, this model does not take into account areas of limited access (such as private properties). In many non-military scenarios, this would probably lead to an underestimate of the time needed to move from one point to another, but the problem is less pronounced in the context of ancient warfare. We can not only safely assume that invading armies did cross and make use of private properties as necessary,[665] but we also know that at least in 2nd-century BC Attica patrolling troops were not limited to using a road network.[666] Secondly, 5 km/h may be slower than the average speed of ancient troops on level ground, especially considering the use of cavalry in the 4th century BC and the Hellenistic period.[667] It is thus important to stress that the resulting walking distances are not intended to accurately represent the time required for troops to move from one point to another, but merely as a tool to investigate the spatial relationship between different sites without neglecting the local topography.

Figures 128–30 show the resulting cost surfaces for three different periods. **Figure 128** reflects the political geography between 400 and 300 BC (with Kleonai already part of the Argive territory, but Halieis still an independent city-state), **figure 129** between 300 and 235 BC (by which point Halieis had been integrated into the territory of Hermion) and **figure 130** between 235 and 146 BC (a period during which Kleonai regained its independence and Tenea first appeared as an independent community).[668]

[664] On "Tobler's Hiking Formula", see section 6.2.
[665] For example, an Athenian division withdrew (with catastrophic consequences) into a walled olive grove during the Sicilian campaign (Thuc. 7.81).
[666] *IG* II^2 1011 (107/6 BC). This inscription honours ephebes for patrolling the countryside without causing harm for farmers (Fernández Nieto 1996, 226–7; Chaniotis 2005, 124).
[667] As noted above, Roman legionaries moved at an average of 5 km/h despite armour, weapons and kit (Riepl 1913, 129). For the use of cavalry for patrol purposes, see Chaniotis 2005, 28; Couvenhes 2011, 296.
[668] For the political history of the Argolid, see section 5.1, for the history of Late Classical and Hellenistic Methana / Arsinoe, see Gill 2007. The political status of Alea and Tenea during the

All three maps illustrate the distance from the nearest urban centre in hours (the "walking distances") as well as boundaries that delineate which area is best accessible from each urban centre (the "cost boundaries").[669] In some areas, the calculated cost boundaries correspond surprisingly well to the territorial borders identified in section 5.1, especially in the area around Cape Iria and the southern Benteni valley. Elsewhere, especially in the case of Argos' control over Kleonai, city-states controlled areas well beyond the cost boundaries. Together with areas far away from the city centres, these zones would have been particularly vulnerable to "large-scale" invasions and "small-scale" raids or skirmishes.

Comparing the walking distances with the distribution of rural fortifications reveals several patterns that would otherwise remain invisible. Beginning with the overall site distribution, rural fortifications are largely absent within one hour's walk of the region's urban centres (**figures 128–30**).[670] The only exceptions are the "special-purpose" towers at Drymoni 1 (20) and 2 (94) southwest of Kleonai (probably connected to local quarries)[671] and the now-submerged structure at Ermioni: Magoula (93), which cannot yet be dated or identified conclusively.[672]

period of study is unclear. Alea was a polis in the 5th and early 4th century BC, but little is known about its later history (Nielsen 2004, 508–9; Maher 2017a, 105–6. 116–8), while Tenea (originally a Corinthian *kome*) became independent at an unknown point before 146 BC (Head 1911, 417; Legon 2004, 466; Shipley 2018, 286–7).

[669] Since this model does not take into account maritime connection routes, the following discussion will focus on the Akte and the northern Argolid rather than on the "maritime" sites in the Kynouria.

[670] At Argos, the lack of fortifications close to the urban centre could be a result of the extensive deposition of sediment on the Argive plain (see section 2.2). However, the lack of rural fortifications around other urban centres suggests an actual pattern of site distribution rather than of site survival.

[671] Marchand 2002b, 312. 326.

[672] Jameson et al. 1994, 502–3. A fourth site, the fort on the small peninsula north of the bay of Palaia Epidavros, can probably be identified as the Athenian fort built in 418 BC (Thuc. 5.75.4–5; Καζά-Παπαγεωργίου and Προσκυνητοπούλου 1981, 105; Σαρρή 1997, 153; Προσκυνητοπούλου 2011, 77) and therefore predates the period examined in this chapter.

Looking at the distribution of individual types of rural fortifications, the fortified settlements, forts, drystone circuits and towers display slightly different patterns. For rural fortified settlements (**figures 131–3**), there seems to be a correlation between the number of sites and the size of a city-state's territory. Halieis, Hermion and Troizen — the smallest fully independent polities in the area — each include one or at the most two dependent fortified settlements,[673] while Epidauros controlled both Kantia 1 (33) and Lygourio 2 (100).[674] In contrast, the much larger Argive territory includes at least nine 4th-century BC or Hellenistic fortified settlements, not counting the sites south of the Zavitsa ridge.[675]

Furthermore, the fortified settlements usually lie at least two hours from the urban centres[676] and are often clustered around the cost boundaries. This pattern is particularly pronounced in the case of Argos. If we exclude locations determined by pre-existing fortifications (Asini (14), Mykinai (51) and Tiryntha (76)) and sites that have not been

[673] Iliokastro (29) and Phourkaria (61). At Petrothalassa (138), a third site in the territory of Halieis and Hermion, there are remains of a well and a double-faced wall in ashlar masonry which may belong to a fortified settlement or a sanctuary. Four pieces of sculpted marble found at the site support the latter interpretation (Φαράκλας 1973, 23. Ε. 2.3; Jameson et al. 1994, 483–4).

[674] For pottery finds suggesting a Hellenistic occupation at Kantia 1 (33), see Gebauer 1939, 288–92; Brommer 1975, 172; Πιτερός 1995a, 111; Simpson and Hagel 2006, 40; for the remains of Lygourio 2 (100), see Καββαδίας 1885, 21–3; Frazer 1898, 232–3; Frickenhaus and Müller 1911, 30; Παπαδημητρίου 1951, 212; Κριτζάς 1972b, 219; Παπαχατζής 1976, 197–9; Foley 1988, 186–7; Πιτερός 2005b, 268. Lygourio's possible identification with ancient Lessa will be discussed below.

[675] Asini (14) (reoccupied and refortified in the 5th or 4th century BC (Πιτερός 1996a, 90) and more extensively in the Hellenistic period (Wells 1992, 139; Penttinen 1996b, 153–4)), Nafplio (52) (fortified in polygonal masonry; for the date see chapter 4), Tiryntha (76) (refortified with a ditch in the Late Hellenistic period (Karo 1915b, plate 1; Kilian et al. 1981, 153; Kilian 1988, 105–6)), Prosymna: Agios Athanasios (67) (a small fortified settlement dating to the 5th and 4th century BC (Penttinen 1996a, 251)), Mykinai (51) (resettled and refortified in the 3rd century BC (Wace et al. 1923, 417; Schilbach 1975, 101; French 2002, 147; Iakovides and French 2003, 27)), Lyrkeia (50) (polygonal walls with evidence for Prehistoric, Geometric, Archaic and Classical occupation (Frickenhaus and Müller 1911, 25; Παπαχατζής 1976, 187; Pritchett 1980, 24; for a possible Hellenistic date of the walls see chapter 4)), Sporitza (74) (probably Hellenistic (see chapter 4)), Achladokampos (1) (probably fortified or refortified in the 4th-century BC (see chapter 4), with evidence for Classical and Hellenistic activity (Simpson and Dickinson 1979, 48; Simpson 1981, 26; Foley 1988, 171)) and Andritsa: Goulas (9) (possibly dating to the Classical period and later (chapter 4)).

[676] The only exceptions are Tiryntha (76), Petrothalassa (138), and Skala 2 (142).

securely identified (Skala 2 (142)),[677] the fortified settlements in the northern and northwestern Argive territory form a line that approximately follows the cost boundary between Argos and its neighbours.

Like fortified settlements, the forts and drystone circuits are usually not found within a 2-hour radius of the nearest urban centre (with the exceptions of Galatas: Megali Magoula (25), Anathema (8), and Soros (72)),[678] and instead tend to be clustered around the cost boundaries or the coast (**figures 134–6**). The site distribution pattern clearly differs between various parts of the region. At Hermion, no forts have so far been recorded and the drystone circuits (Phranchthi (62), Vigla (84), and Vourlia 1 (86)) are concentrated on the northwestern coast. All three sites have an excellent view towards the sea and are located near sheltered anchorages,[679] while Phranchthi (62) and Vigla (84) are also located on the main overland route between the western Argolid and the southern Akte. However, with their hilltop location all three sites seem to prioritise security over direct access to land or maritime routes.

In the southern Epidauria, forts and drystone circuits form a distinctive cluster of intervisible sites along the Benteni valley,[680] which coincides closely with the cost boundaries in the region. Two of these sites, the fort at Iria (31) and the hilltop site at Stavropodio (75), date to the late 4th- or 3rd-century BC and the Hellenistic period respectively,[681] while Benteni Kiapha (16) and Gyphtokastro (27) can only be attributed

[677] At Skala 2 (142), the interpretation as fortified settlement is uncertain due to a lack of upstanding ancient remains. For a description of the site, see Pritchett 1980, 15; Πίκουλας 1995, 189.
[678] Both Anathema (8) and Soros (72) have been dated to the Classical period. For the date of Anathema (8), see Γιαννοπούλου 2009, 535, for Soros (72), see Jameson et al. 1994, 522.
[679] Due to the sea-level rise of ca. 5 m, the Hellenistic coastline in this region probably lay further to the seaward than it does today (section 2.2).
[680] See section 6.1.
[681] For Iria (31), see Schilbach 1976, 128, for Stavropodio (75), see Αρχοντίδου-Αργύρη 1975, 77; Touchais 1977, 554.

broadly to Classical or Hellenistic period.[682] Skala 1 (104) lacks any datable finds or features. Looking more closely at the structures' building techniques, there are strong similarities in between the masonry at Iria (31) and the polygonal walls at Benteni Kiapha (16): both sites display a strong overall linear structure in the arrangement of the polygonal blocks (**figures 43 and 137**). Similar traits can also be found at Gyphtokastro (27), where the roughly hewn circuit wall was repaired with smaller polygonal blocks during a later period.[683] This may suggest that all three sites were built or rebuilt around a similar time in the late 4th or 3rd century BC. Together, the three sites may thus possibly attest a particular concern for securing Epidauros' southern border between ca. 325 and 200 BC, incorporating existing structures at Benteni Kiapha (16), Gyphtokastro (27) and possibly Skala 1 (104).[684]

Moving from the eastern Akte to the valley between the Saronic and the Argolic Gulfs, the walking distances reveal another intriguing site distribution pattern. Two major fortifications dominate the valley: the fort of Kazarma (39) and the fort of Kastraki (35), ca. 3 km to the east (**figures 20 and 138**). Covering an area of ca. 0.34 ha and 0.39 ha respectively, they are among the largest forts in the region, exceeded in size only by Kastro tis Paliopanagias (38) in the Kynouria (ca. 0.45 ha) and Ano Phanari (10) (ca. 1.25 ha). Although the chronological distribution of surface finds at Kazarma (39) and Kastraki (35) differs slightly,[685] the architecture of the two sites suggests a construction

[682] For the finds at Benteni Kiapha (16), see Φαράκλας 1972a, Ε. 3.8; Brommer 1975, 176; for Gyphtokastro (27), see Φαράκλας 1972a, Ε. 3.11; Brommer 1975, 173; Αρχοντίδου-Αργύρη 1975, 79; Touchais 1977, 554; Tausend 2006, 154.
[683] Αρχοντίδου-Αργύρη 1975, 79.
[684] At Gyphtokastro (27) a Late Helladic date has been suggested for the original circuit in roughly hewn masonry (Αρχοντίδου-Αργύρη 1975, 79; Touchais 1977, 554). The drystone masonry at Benteni Kiapha (16) and Skala 1 (104) cannot be securely dated but may predate the Hellenistic period.
[685] The pottery recorded at Kastraki (35) dates to the Late Helladic, Classical, Medieval and modern periods (Brommer 1975, 173), while Kazarma (39) has so far produced Early Helladic, Late Helladic, Classical, Hellenistic and Roman sherds (Ålin 1962, 51; Scoufopoulos 1971, 57; Brommer 1975, 173).

around the same time, probably after the rise of mechanised siege-craft in mid 5th century BC.[686] The overlap gate at Kastraki (35) closely parallels the 4th-century BC gates B and D at Mantineia,[687] while at Kazarma (39) the presence of no less than two posterns along the relatively short circuit similarly indicates a construction from the 4th-century BC onwards.[688] As neither fort shows any features specific to later Hellenistic fortified architecture (for example constructions relating to artillery), they probably belong to the first half of the 4th-century BC rather than to a later period.[689]

Despite their similar date, the two sites display marked differences in construction technique and masonry style. Firstly, Kazarma (39) is built in closely-fitted polygonal masonry, while the blocks at Kastraki (35) are more roughly hewn (**figure 139 a–b**). Secondly, the towers at Kazarma (39) are built with two neat faces of masonry enclosing a rubble core, whereas the towers at Kastraki (35) consists of an outer face in large polygonal blocks and an inner face in smaller stone, leaving only little or no space for an interior rubble fill (**figure 140 a–b**). Thirdly, the two sites show a different treatment of the underlying bedrock. While at Kastraki (35) many walls were built without carefully cutting the bedrock (resulting in large gaps between the walls and the substrate), the bedrock at Kazarma (39) was carved to create a seamless transition between the substrate and the built wall.

[686] At both sites, the towers are not properly bonded with the curtain walls (Schilbach 1975, 97–8. 109–10). For Kazarma (39), Schilbach 1975, 110–12 furthermore argued that the mudbrick crenellation or parapet points to a date before the introduction of torsion artillery. However, the walls of Gela and the Attic inscription *IG* II^2 463 (307/6 BC) demonstrate that mudbrick continued to be used for crenellations and parapets into the 4th and 3rd century BC (Lawrence 1979, 362. 368–8).

[687] For the date of the walls at Mantineia, see Maher 2012, 170–1; 2017a, 228–9.

[688] Both posterns are protected by nearby towers. Since the site is not a fortified settlement, a primarily civic function for these entrances can be excluded. For the introduction of military posterns, see Winter 1971, 240–41; Lawrence 1979, 335–6.

[689] See also chapter 4. Both forts are well preserved and show no signs of substantial damage at key strategic areas. A scenario in which one fort was destroyed and replaced by the other in short succession can therefore be excluded.

The location of these two substantial and contemporary forts in such close vicinity is intriguing and has so far never been satisfactorily explained. Most scholars have attributed both sites to Argos,[690] but without addressing the question why the city should invest in constructing two forts in this particular region, especially since fortifications of this type are otherwise largely absent from the Argive territory. Neither have previous scholars offered any comments on the varying construction techniques — a difference that does not exclude both sites from being Argive, but at least requires an explanation.

The main challenge to understanding the two forts is the uncertain course of the Argive-Epidaurian border. Pausanias located this border at Lessa,[691] a settlement known as a 4th-century BC Argive *kome*[692] and usually identified with modern Lygourio. However, this identification is far from certain[693] and an alternative (but no more secure) association with Kazarma (39) has also been proposed since the 19th century.[694]

As noted above, the cost boundaries in the Argolid do not always coincide with the actual 4th-century BC and Hellenistic territorial borders, meaning that the walking distances will not immediately solve this historical-geographical puzzle. However, the comparison between cost boundaries and the sites' locations shows that Kazarma (39) and Kastraki (35) are not merely located in an area that is as accessible from Argos as it is from Epidauros, but, interestingly, lie immediately on either side of the cost boundary

[690] See for example Schilbach 1975, 98–99. 109–112
[691] Paus. 2.26.1.
[692] *SEG* liv 427 (late 4th century BC).
[693] The identifications rests on the assumption that two perirrhanteria dedicated to Athena on the hill Agios Athanasios near Lygourio belong to a temple of Athena mentioned by Paus. 2.35.10 (Μίτσος 1935, 16–8; Παπαδημητρίου 1951, 212; Μίτσος 1970, 29–30; Παπαχατζής 1976, 197–9; Billot 1997, 19).
[694] For the identification of Lessa with Kazarma (39), see Frazer 1898, 232; Scranton 1938, 537; Winter 1971, 43; Rupp 1976, 267.

— Kazarma (39) in the west towards Argos and Kastraki (35) in the east towards Epidauros (**figures 128–30**).

This pattern — two fortifications located only few kilometres apart on either side of a cost boundary, facing each other across a fertile plain — strongly recalls the situation in the Mazi plain on the Attic-Boiotian border. This small agricultural plain is dominated by the Classical fortifications of Eleutherai in the west and Oinoe in the east.[695] Although both sites were long believed to be Athenian,[696] S. Fachard and others have convincingly argued for identifying 4th-century BC Eleutherai as a Boiotian fortification controlling both the western part of the agricultural Mazi plain and the main route between Attica and Boiotia.[697] Although both Eleutherai and Oinoe are considerably larger than Kazarma (39) and Kastraki (35),[698] they provide a close parallel, so perhaps the two sites between the Argolic and Saronic Gulfs should be understood as one Argive and one Epidaurian fort rather than as two fortifications built by Argos.

In the absence of literary and epigraphic sources, this hypothesis is nearly impossible to corroborate, but there are at least three points in favour of seeing Kazarma (39) as Argive and Kastraki (35) as Epidaurian. Firstly, the forts are very similar in terms of location. Both are situated at a comparable distance from the most convenient route through the region, both have views of a very similar area and neither has any visual

[695] See, for example, Fachard 2013. The plain is currently being studied in the *Mazi Archaeological Project* (*MAP*), a diachronic regional survey conducted by the Ephorate of Antiquities of West Attika, Piraeus, and the Islands, and the Swiss School of Archaeology in Greece. For the location of the Attic border (investigated through a cost-allocation model of the Attic demes), see Fachard 2017a, 209.
[696] See, for example, Ober 1985, 160–3.
[697] Fachard 2013, 81–2. 84–91. 94–106; 2017b, 32. For earlier studies advocating a Boiotian construction, see Camp 1991; Cooper 2000.
[698] Eleutherai covers an area of ca. 2.9 ha, Oinoe an area of ca. 2.8 ha (Fachard 2013, 87. 93). The reason for this difference in size is probably that Eleutherai and Oinoe are the site of large nucleated settlements (Fachard 2013, 82), while Kazarma (39) and Kastraki (35) seem to be primarily military-strategic fortifications.

connections to a site that is not visible from the other. This makes it unlikely that one city-state saw the need to construct both sites at the same time.

Secondly, not only are forts rare at Argos,[699] but there is also no other cluster of two Argive forts in such close proximity. Even beyond the Argolid, it would be unusual for a Late Classical or Hellenistic city to construct two contemporary forts within a few kilometres of each other.[700]

Thirdly, as noted above, the two forts differ considerably in construction technique, despite having been built from the same type of local limestone. Taking these observations one step further, the masonry at Kazarma (39) closely resembles Argive sites, especially the polygonal west wall on the Larissa itself (**figure 124**). In contrast, the masonry employed at Kastraki (35) has no Argive parallels.

Together these three points make a case for seeing Kazarma (39) as an Argive and Kastraki (35) as an Epidaurian fort, although the evidence presented here is admittedly not conclusive. This would place the 4th-century BC border between Argos and Epidauros near the calculated cost boundary and suggest that the Classical drystone circuit at Kastro 2 (37) may similarly be connected to Epidauros rather than Argos.[701]

Among the city-states in the Argolid, Epidauros thus seems to have invested most heavily in the construction of forts or drystone circuits. Unusually for the region, it is even possible to distinguish three main waves or phases of construction — firstly, the construction of the fort at Kastraki (35) in the early 4th century BC; secondly, the fort at

[699] The only other examples are Agio Lias (2) and Agios Adrianos (3).
[700] See, for example, Ober 1985, 110 for forts in Attica or Fachard 2012, 243 for forts in the territory of Eretria. The map published by Farinetti 2011, 255 at first glance suggests a higher density of forts in Boiotia, but a comparison of the map with the more detailed appendices shows that many sites do in fact belong to different city-states or are not securely identified as fortifications.
[701] The circuit at Kastro 2 (37) is so far undatable, but the finds include Classical pottery (Rupp 1976, 264; Tausend 2006, 29).

Ano Phanari (10) before the late 4th century BC; and thirdly, the fortification or refortification of sites in the Benteni valley in the late 4th or 3rd century BC.[702]

Both in the Epidauria and beyond, the distribution of towers — the final type of fortified site in the region — is strikingly different to the patterns observed so far (**figures 141–3**). Looking at the region as a whole, towers have a reverse overall distribution pattern to the forts or drystone circuits. While the latter are common on the Akte but rare in the territory of Argos, towers dominate at Argos but are less common on the Akte. The locations chosen for towers are also more varied, although areas within one hour of the urban centres are generally still avoided.

Focusing on the territory of Argos, which has the highest concentration of towers, two patterns are particularly interesting. Firstly, the towers in the west and northwest roughly follow the cost boundary between Argos and the neighbouring Arkadian city-states. Some sites are even (in terms of walking distances) located closer to Alea or Phleious than to Argos itself and thus lie in particularly vulnerable areas.

Secondly, the conspicuous cluster of towers on the northern edge of the Argive plain falls immediately south of the cost boundary between Argos, Kleonai and Tenea (**figure 143**). In contrast, only one tower (Agios Sostis (5)) lies on the cost boundary

[702] Due to their uncertain chronology, these Epidaurian forts and drystone circuits are difficult to place in a precise political context. For the early 4th-century BC fort at Kastraki (35), there are at least two plausible contexts: the Corinthian War (395–86 BC), when Epidauros appears as an ally of Argos' enemy Sparta (Xen. *Hell.* 6.2.16), and the period of Argive aggression against Epidauros between the battle of Leuktra in 371 BC and Epidauros' peace with Thebes in 365 BC (Kralli 2017, 7). Evidence for subsequent hostilities between Argos and Epidauros comes from an honorific decree indicating an Argive cleruchy at Epidauros (IG IV^2. i 69 = SEG xi 400), but probably postdates the construction of Kastraki (for the date of this decree see, for example, Kralli 2017, 8. 426–7). The fortifications in the Benteni Valley might partly belong to the period between 243 and 228 BC, by which point Epidauros (but not Argos or Hermion) had been incorporated into the Achaean Leagues, but at the moment there is no firm evidence to support this hypothesis (for the incorporation of Epidauros into the Achaean Leagues, see Kralli 2017, 162–3; for the incorporation of Argos, see Kralli 2017, 169–77).

between Argos and Corinth (**figures 141–2**). This pattern becomes even more pronounced when all four types of fortification are considered together (**figures 128–30**).

Given this distribution pattern, it is very tempting to see the construction of rural fortifications in this area as an Argive response to political insecurity or instability in the 3rd century BC or around 235 BC, when Argos lost control of Kleonai as a political "buffer zone" and came under increasing pressure from the Achaean League.[703] Alternatively, the sites could predate the incorporation of Kleonai into the Argive territory. Most dated fortifications fit well within such a narrative.[704] For example, the fortified settlement at Prosymna: Agios Athanasios (67) was probably established in the 5th century BC before Kleonai was incorporated into the Argive territory,[705] while the resettlement and rebuilding of the fortifications at Mykinai (51)[706] and construction of the drystone circuit at Vigliza (85)[707] fall within the 3rd century BC. Even the tower at Agios Sostis (5) on the cost boundary between Argos and Corinth — constructed in the Late Classical period when Argos and Corinth were "direct neighbours"[708] — would fit this general chronological development.

To sum up the results of the cost surface analyses, the walking distances and cost boundaries have highlighted regional, local and chronological patterns. However, little has been said so far about how these patterns might help to explain the function of individual fortifications in the region under investigation.

[703] For the Achaean League's repeated attacks on Argos between 243 and 229 BC, see Kralli 2017, 169–77.
[704] Only the tower at Prosymna: Pyrgouthi (69) (constructed around 300 BC (Penttinen 2005, 63–5)) does not follow the proposed chronological pattern.
[705] Penttinen 1996a, 251.
[706] This development dates to the 3rd century BC (Wace et al. 1923, 417; Schilbach 1975, 101; French 2002, 147; Iakovides and French 2003, 27).
[707] The site is dated by surface pottery to the Hellenistic period (Penttinen 1996a, 270).
[708] Wiseman 1978, 116; Cloke 2016, 910.

Looking first at the implications of the overall site distribution patterns, the near-absence of rural fortifications within one hour of the urban centres indicates that within this radius the urban fortifications fulfilled all functions that required rural fortifications in more distant parts of the territory. Consequently, defensive strategies may be impossible to trace in small city-states.

A second striking pattern that is repeated throughout the region is the concentration of fortified sites along cost boundaries. At first glance, this pattern seems to indicate that many Late Classical and Hellenistic rural fortifications were built to deny approaching enemies access to a city's territory. However, this impression is misleading. Firstly, it has to be stressed that although territorial borders occasionally coincide with cost boundaries, the cost boundaries are not intended to model the limits of ancient territories. Secondly, most fortifications along the cost boundaries are not located in the immediately vicinity of routes or passes between different territories. Since bringing an invasion to a halt at the fortifications thus cannot have been the intended strategy, most sites along the cost boundaries could at best serve as rural garrisons from which troops could be dispatched to the wider border region.

But even from this angle the practical use of many rural fortifications would have been very limited. For example, forts, towers and drystone circuits were regularly built in particularly inaccessible locations such as hilltops, ensuring a good view but hampering quick and efficient movement between the fortifications and the surrounding countryside.[709] Other sites do not have a particularly good view of their surroundings and are thus not ideally situated from a strategic perspective.[710] Only the garrisons at the

[709] Some examples are Agio Lias (2), Benteni Kiapha (16) and Stavropodio (75), which even today are difficult to reach.
[710] A good example is the polygonal tower at Phichtia: Limiko (58). As already noted by Jansen 2002, 79, this tower has only a very limited view. Other examples are the towers at Kantia 2 (34) (discussed above), Kophy Rachi (42) (with a good view towards the Argive plain, but hardly any towards the plain of Prosymna) and Spathokommeno (73).

Argive fort of Kazarma (39), the Troizenian fort of Anathema (8) and the Epidaurian forts of Iria (31), Gyphtokastro (27), Ano Phanari (10) and Kastraki (35) would thus have been stationed at suitable positions to engage invading enemies in border areas. Taken together, the size and location of towers, forts and drystone circuits considered so far indicates that only a few sites — the towers at border passes and forts just mentioned — were built specifically to ensure a military presence along the limits of the city-states' territories.

d) Criterion 3: defensibility and water supply

Besides location and size, the defensibility of rural fortifications is another feature that helps to evaluate the sites' potential in different defensive strategies. Defensibility was always desirable but would have been particularly important at fortifications built as strongholds, either to provide a base from which an invading army could be harassed with small troop contingents or to force an enemy into a lengthy and expensive siege in order to secure its retreat routes. When trying to identify such strongholds, towers and minor forts can be ruled out on the ground that their garrisons were not large enough to pose a serious threat to an invading army. This leaves twelve forts and drystone circuits, as well as the fortified settlements in the region. Most of these sites are well protected by natural or built defences,[711] and suitably placed for harassing a hostile army or threatening its retreat.[712] However, their defensibility not only depends on their location and walls, but also on the availability of supplies and provisions, especially water.

[711] One exception is the small fortified settlement of Prosymna: Agios Athanasios (67) in the northern plain of Prosymna, which lacks strong defences and was therefore not built to withstand a "large-scale" attack for any amount of time. For a description of the site and its surface pottery, see Penttinen 1996a, 250–1.

[712] For the routes in the region, see section 6.2. The only exceptions are Elliniko Astrous (21), Stavropodio (75), Tsiorovos Dolianon (82), Vourlia 1 (86) and Skala 1 (104) (located some distance from the nearest route), as well as Vigliza (85) (near a route that was probably primarily of local rather than of regional importance).

Many rural fortifications in the Argolid are today located close to natural water sources,[713] but only Mykinai (51) had direct access to spring water within the circuit walls.[714] Unless this scarcity of intramural springs is a result of modern changes in the groundwater level,[715] most sites therefore had to be supplied from wells or cisterns.[716]

Looking at the different types of major rural fortifications, the drystone circuits so far lack any evidence for cisterns or wells. If this picture is correct — rather than merely the result of a lack of research — this indicates that drystone circuits were not intended as military "strongholds" in times of conflict, a conclusion that fits well with the sites' size and distribution pattern. Soros (72) and Vigla (84) are probably too small to hold a garrison sufficient to threaten a hostile army, while Vigliza (85), Vourlia 1 (86) and Skala 1 (104) are located at some distance from major routes through the region. Together, these observations argue against the use of drystone circuits to harass hostile troops or cut off retreat routes.

Moving on to the forts and fortified settlements, Late Classical or Hellenistic cisterns and wells have been recorded at twelve out of the 32 sites,[717] mostly at fortified

[713] For example the spring at the foot of Kastraki (35) (Παπαχατζής 1976, 199).
[714] Both the Mycenaean cistern (Wace 1936, 405; Iakovides and French 2003, 13) and the Hellenistic Perseia fountain (Holland et al. 1953) were supplied from the Perseia spring.
[715] For changes in groundwater levels, see section 2.2.
[716] Today wells and cisterns are often filled with earth or rubble, and are thus difficult to distinguish from each other without excavation.
[717] Fortified settlements: Agios Andreas (4) ("several cisterns varying in shape and size" (Goester 1993, 88)), Andritsa: Goulas (9) (one "pear-shaped" cistern (Ψυχογυιού 2000, 195)), Asini (14) (several wells and cisterns, both on the acropolis and in the lower town (Frödin 1938, 41–2. 67)), Elliniko Astrous (21) (seven cisterns, presumably all bell-shaped (Goester 1993, 71–2)), Ierakas (28) (several ancient or later cisterns which were mapped but not described by Wace and Hasluck 1908, 169), Iliokastro (29) (a circular stone-built well (Jameson et al. 1994, 520)), Lyrkeia (50) (a plaster-lined cistern, ca. 11 m long and between 2.5 and 5 m wide (Pritchett 1980, 25)), Mykinai (51) (the Mycenaean cistern and the Hellenistic Perseia fountain house (Wace 1936, 405; Holland et al. 1953; Iakovides and French 2003, 13)), Poulithra (65) (a cistern similar to the one recorded at Andritsa: Goulas (9) (Ψυχογυιού 2000, 195)) and Petrothalassa (138) (a square well lined with ashlar blocks (Φαράκλας 1973, E. 2.3; Jameson et al. 1994, 483)); forts: Agios Adrianos (3) (a plaster-lined cistern with a corbelled roof, at least 3 m deep and measuring ca. 3.5 by 5 m (Schilbach 1975, 56–7)) and Kazarma (39) (a rectangular plaster-lined cistern, measuring ca. 2.5 by 6 m (Schilbach 1975, 49–50)). In the Late Helladic period, Tiryntha (76) was connected to an underground spring by two passages, but both were found filled with debris

settlements. As far as we can tell without at least a partial excavation, the majority of cisterns belong to a common type with a cylindrical body and a narrow circular opening (variously referred to as "bell-", "pear-" or "bottle-shaped"; **figure 144**). At most sites, only a single cistern is known, but this may partly be because of a lack of research, since better-studied sites like Elliniko Astrous (21) were found to contain up to seven cisterns. They attest the collection and storage of rain water (possibly in domestic contexts),[718] but since both the capacity of the cisterns and the size of the population remain unknown, it is impossible to determine how long these supplies would have lasted in case of a siege.

Compared to this overall picture, the sites of Agios Adrianos (3), Kazarma (39) and Lyrkeia (50) stand out. Instead of the usual "bottle-shaped" cisterns, they include large, rectangular, covered water tanks (with a surface area between 15 and 27.5 m^2) built in polygonal masonry and lined with plaster (**figures 145–6**). The tanks at Agios Adrianos (3) and Lyrkeia (50) are located at the lowest part of the respective fortification, which suggests that they were used to collect rainwater run-off from the surrounding ground or roof surfaces.

Since none of the three rectangular cisterns has ever been fully excavated, their exact capacity remains unknown. But judging by what is visible today, their volume was considerable. The cistern at Agios Adrianos (3) (though partly filled with rubble) is at least 3 m deep, resulting in an overall capacity of at least 52.2 m^3 (or 52200 litres). Assuming a similar depth, the cistern at Kazarma (39) would hold at least 45 m^3 (45000 litres). Within these limits of capacity, the volume of water available at any given

(stones, earth, pottery and animal bones) from the Hellenistic and Roman period (Verdelis 1963, 129–30). By the time the site was refortified in the Late Hellenistic period, they were therefore no longer in use. A further cistern exists at Ano Phanari (10), but belongs to the site's Medieval phase (Κοντογιάννης 2008, 50). Given the current state of research, it is entirely possible that further cisterns exist, but have so far not been discovered or recorded.

[718] For comparison, see the "bottle-shaped" cistern at the Classical "House C" at Halieis (Boyd and Rudolph 1978, 350; Ault 1994a, 140–1).

time would depend upon two variables: the average input of water and the average extraction.

To calculate the average input of water, two pieces of information are needed: firstly, the catchment area used to collect rainwater (for example a roof-surface, an area of bedrock or a paved impluvium), and secondly the average monthly precipitation. Data collected by the *Hellenic National Meteorological Service* provides the modern average monthly rainfall figures for the village of Pyrgela near Argos,[719] which will be used here as a basis for studying the water supply of Agios Adrianos (3), Kazarma (39) and Lyrkeia (50).[720] To calculate a cistern's approximate average monthly input (in litres), this monthly rainfall figure (in mm) is multiplied by the catchment area (in m^2), assuming a 20 % loss of surface run-off due to evaporation or leakage.[721] Additional water loss through absorption also has to be taken into account for calculating the run-off collected from tiled roof surfaces.[722] As an example, **tables 14 and 15** show the average monthly run-off that can be collected in the Argolid from a tiled roof and a bedrock or paved surface measuring ca. 10 m^2.

Turning to the average extraction of water, this again hinges upon two factors: the number of people present within the respective fortification and the average daily water consumption from the cistern per person. For antiquity, the latter figure is very much disputed,[723] and strongly depends on whether any particular cistern was used

[719] http://www.emy.gr/emy/en/climatology/climatology_city?perifereia=Peloponnese&poli=Pyrgela (11/03/2018).
[720] Section 2.2 has shown that different studies of climate change in the region have produced conflicting results. Until further research, the modern rainfall figures will thus be used as a guideline.
[721] For a discussion of the loss of surface run-off, see Klingborg and Finné 2018, 6.
[722] Roman roof tiles absorbed ca. 5–15 mm of rain before producing any surface run-off (Thomas and Wilson 1994, 140). Assuming that this applies equally to Classical and Hellenistic tiles and using modern rainfall figures, this means that tiled roofs did not produce any run-off in June and July.
[723] For a summary of this discussion, see Klingborg and Finné 2018, 7–8.

mainly to secure sufficient hydration, or was also used to supply water for further activities (such as personal hygiene or manufacturing processes) or for domestic animals. Given that the present part of this study aims to identify sites that could have served as military "strongholds" in times of conflict, the following calculations will focus on the former scenario and will be based on a minimum requirement of 5 litres of water per day per person.[724] To estimate the average monthly extraction from a cistern, this figure (5 litres) has to be multiplied by the number of individuals using the cistern and the number of days (28, 30 or 31 days, depending on the month).[725]

Combining these figures, two variables remain unknown: the catchment area of the cisterns, and the number of individuals present. Consequently, it will not be possible to prove conclusively whether any of the five cisterns could have supplied the local garrison. Nevertheless, the figures help to evaluate the role of the cisterns for the sites' water supply at times of conflict, especially at Agios Adrianos (3) and Kazarma (39).[726]

As argued above, the fort at Agios Adrianos (3) probably housed a very small garrison, perhaps as few as 16 men. Each month, these 16 men would require a minimum of 2240–2480 litres of drinking water. Assuming that the cistern was emptied for cleaning once a year (for example at the beginning of the rainy season in October),[727] this requirement could be met by collecting the run-off from a tiled roof measuring ca. 81 m^2 or from ca. 77 m^2 of bedrock (**table 16–7**). Given that bare bedrock today characterises much of the hill,[728] this would certainly be possible. If the daily water consumption is increased to 15 litres per person to allow for personal hygiene and other

[724] This figure (used for example by Thomas and Wilson 1994, 170 or Connelly and Wilson 2002) equals the WHO's estimate of the bare daily minimum of water required to sustain health (Klingborg and Finné 2018, 8).
[725] In the present study, February will consistently be counted as 28 days, ignoring leap years.
[726] Unlike Agios Adrianos (3) and Kazarma (39), Lyrkeia (50) is a fortified settlement, so that the number of individuals present within the fortified area is even more difficult to estimate.
[727] On the yearly cleaning of cisterns, see Klingborg and Finné 2018, 9.
[728] The tower measures 9.2 by 9.2 m and could thus have carried a roof measuring ca. 84.64 m^2.

activities,[729] the necessary catchment area grows to 230 m^2 (**table 18**), but even so the cistern would never reach its full capacity.

Although these figures are very speculative, they strongly suggest that the cistern at Agios Adrianos (3) could have served as the main water supply for a permanent garrison and (depending on the size of the catchment area) may even have produced sufficient surplus for additional men stationed at the fort on a seasonal basis or for refugees from the surrounding countryside. A similar picture emerges at Kazarma (39), where a garrison of 40 men would require the run-off from ca. 195 m^2 of bedrock (based on a daily consumption of 5 litres per person),[730] presumably again without ever reaching the full capacity of the cistern (**table 19**).

The rectangular cisterns could thus have played a major role in the water supply of the respective sites, both for seasonal use and on an everyday basis. In times of conflict, a garrison could probably rely on the rainwater collected over the past months, considerably increasing the fortifications' defensibility. In combination with their strong natural and built defences, this makes Agios Adrianos (3), Kazarma (39) and probably Lyrkeia (50) particularly suitable bases from which to threaten foraging or retreating troops.

e) Criterion 4 and 5: construction technique and surface finds

Two final features that may help to understand the possible military function of ancient rural fortifications are their construction technique and find material. These two features are particularly important in trying to identify the above-mentioned "offensive" ἐπιτειχίσματα, which featured most prominently in the Peloponnesian War (with the

[729] For this estimate, see Klingborg and Finné 2018, 7.
[730] Given the suspiciously lush vegetation in the southeastern part of the site, other cisterns may also exist within the circuit at Kazarma (39).

Athenian fort at Pylos (425–409 BC)[731] and the Spartans at Dekeleia (413–404 BC)[732]), but are also attested in the 4th century BC.[733] Although no surviving text mentions the construction of ἐπιτειχίσματα in the Argolid,[734] it is clear that at least the Argives themselves made use of such structures during the 4th century BC.[735]

Thucydides describes in detail the construction of the Athenian drystone and clay ἐπιτείχισμα on the naturally defensible Koryphasion promontory at Pylos (today known as Palaiokastro),[736] but the site was extensively fortified in later periods, so that no remains of the described structure can be identified.[737] For Dekeleia, the second prominent ἐπιτειχισμός of the Peloponnesian War, we conversely lack a detailed literary description, while a ca. 800 m long drystone circuit on the Palaiokastro hill is commonly identified as the fortification mentioned by Thucydides.[738]

Judging by these two examples, drystone masonry was favoured for Classical ἐπιτειχίσματα. The following discussion will therefore focus on the five drystone circuits constructed or occupied in the Argolid during the Late Classical period.[739] All five sites

[731] Thuc. 4.3–41; D. S. 13.645–7; Xen. *Hell*. 1.2.18.
[732] Thuc. 7.19.2; Xen. *Hell*. 2.3.3.
[733] For a discussion of the ἐπιτειχισμός in the 4th century BC, see Westlake 1983, 19–23 19.
[734] Xen. *Hell.* 4.7.7 reports that in 388 BC the Spartan king Agesipolis planned to construct a fort at Kelossa (the entrance to the Argive territory), but was dissuaded by unfavourable signs during a sacrifice.
[735] According to Xen. *Hell.* 7.2.1, the Argives constructed a fort on the Phleiasian Trikaranon mountain in 366 BC. For a detailed description of the archaeological remains at this site, see Cloke 2016, 574–586.
[736] Thuc. 4.4. For the Athenian fortification at Pylos and the local topography, see Pritchett 1965, 21; Wilson 1979, 54–61; Strassler 1988; Rubincam 2001; Dyson 2002.
[737] Some walls in drystone masonry survive on the summit of the neighbouring island Sphakteria (noted in summer 2017), which was occupied by the Spartans in the same campaign (Thuc. 4.31), but they could well belong to a later period.
[738] For the site of Palaiokastro, its description and its two (not mutually exclusive) identifications as the acropolis of the deme Dekeleia and the fortification used by the Spartans in the Peloponnesian War, see for example Michhöfer 1895, 3–4; Chandler 1926, 16; Αρβανιτόπουλος 1958, 15–22; McCredie 1966, 56–8; Ober 1985, 141–2; Mersch 1996, 118–9; Funke 2000, 124.
[739] Kastro 2 (37) (including Classical surface pottery (Rupp 1976, 264; Tausend 2006, 29)), Phranchthi (62) (probably constructed in the Classical or Hellenistic period (Jameson et al. 1994, 475)), Soros (72) (tentatively dated to the Classical period through surface pottery (Jameson et al. 1994, 522)), Vigla (84) (including Classical and Hellenistic pottery (Simpson 1981, 31; Jameson et al. 1994, 510)) and Vourlia 1 (86) (including Classical sherds (Κύρου 1990, 85. 222;

are considerably smaller than Dekeleia or the Koryphasion promontory,[740] and could only have sheltered small garrisons, which would have been vulnerable in hostile territory.

Surface finds in and around these five drystone circuits are usually scarce (which may argue for a temporary rather than permanent occupation),[741] but fall into three groups: tiles, worked stone tools and pottery. Fragments of tile, noted at Soros (72), Vigla (84) and Vourlia 1 (86),[742] may belong either to roofed structures or to the capping of mudbrick walls: in any case they characterise a fortification as more than a mere temporary structure.

The worked stone tools from drystone circuits include a Late Classical or Hellenistic andesite quern at Phranchthi (62),[743] a Classical andesite mortar at Soros (72),[744] and an olive mill at Vourlia 1 (86).[745] These finds suggest an occupation over at least some period of time (an army on the move would hardly travel with a heavy stone mortar),[746] and while querns and mortars may have been used for food preparation in a

Suto 1995, 11)). As noted above, the drystone structures at Akrotiri Iria 1 (90), Akrotiri Iria 2 (91), Skala 1 (104) and Aitolithi (130) are currently undatable. Kastro 1 (36) probably predates the period of study (Jameson et al. 1994, 442), while Vigliza (85) most likely belongs to the Hellenistic period (Penttinen 1996a, 270).

[740] The promontory measures over 20 ha, but the extent of the Athenian fort is unknown.

[741] One exception is Vourlia 1 (86), where "fine blackglazed sherds and glazed tiles are abundant" (Suto 1995, 11).

[742] Soros (72): Jameson et al. 1994, 521–2; Vigla (84): Jameson et al. 1994, 510; Vourlia 1 (86): Suto 1995, 11.

[743] This quern is mentioned by Jameson et al. 1994, 475, but not by Kardulias and Runnels 1995, at least not under the original site number C 43. However, Kardulias and Runnels 1995, 117 list a quern at the adjacent findspot C 11, which is closely related to C 43 and was possibly part of the same site (Jameson et al. 1994, 475). This quern at C 11 is not listed by Jameson et al. 1994, 466–7, which suggests that Kardulias and Runnels 1995 combined the finds from C 11 and C 43, and that the quern listed under findspot C 11 is in fact from C 43.

[744] Jameson et al. 1994, 522; Kardulias and Runnels 1995, 135.

[745] Suto 1995, 11. In addition, obsidian flakes were discovered at Kastro 2 (37) (Rupp 1976, 264) and Phranchthi (62) (Jameson et al. 1994, 475), but it is unclear if they belong to the period of study or are residual finds from an earlier phase of occupation. For the use of flaked stone tools in historical periods, see Runnels 1982; Kardulias and Runnels 1995, 97–103.

[746] The example at Soros (72) measures over 30 cm in diameter and was originally at least 30 cm high (Kardulias and Runnels 1995, 450).

military context,[747] the olive mill clearly points to an identification of Vourlia 1 (86) as a "civilian" settlement rather than a primarily military-strategic site.

Fragments of pottery make up the third group of surface finds, but the information currently published on this material is not very detailed. For Kastro 2 (37) and Vourlia 1 (86), surface pottery is only mentioned in passing (recording a possible date, but no specific shapes) and even the assemblages from the surveyed sites in the southern Argolid have so far not been fully published. Thus, the pottery only seldom presents a clear picture. At Vourlia 1 (86), the "abundance"[748] of sherds supports the proposed interpretation as a fortified settlement, while at Vigla (84) the presence of both Classical and Hellenistic pottery points to at least sporadic site use over a longer period of time.[749] Summing up the evidence of the surface finds, an interpretation primarily as a temporary camp should be ruled out for Vourlia 1 (86) (on the grounds of the abundant pottery and the mortarium) and probably Soros (72) (on the grounds of the stone mortar found at the site).

At the remaining circuits, where surface finds are less indicative, the location provides additional clues. Both Phranchthi (62) and Vigla (84) are probably associated with nearby settlements at the foot of the respective hills (Phranchthi (62) with the site of Magoula Evstratiou (possibly ancient Mases)[750] and Vigla (84) with Agios Ioannis),[751] arguing against an identification of the sites as temporary camps.[752] While no settlement

[747] For Soros (72), see Kardulias and Runnels 1995, 135.
[748] Suto 1995, 11.
[749] Simpson 1981, 31; Jameson et al. 1994, 510.
[750] Jameson et al. 1994, 466–7. 475.
[751] Jameson et al. 1994, 508–10.
[752] At Phranchthi (62) and Magoula Evstratiou, the chronological distribution of surface pottery may cast further light on the sites' historical development. At Phranchthi (62), the majority of historical pottery is Late- and Subgeometric, even though the circuit itself probably dates at least partly to the Classical or Hellenistic period. In contrast, Archaic, Classical and Classical or Hellenistic pottery predominates at Magoula Evstratiou (Jameson et al. 1994, 466–7. 475). This may represent a shift of settlement from the summit to the foot of the hill in the Archaic period, before the summit was fortified as a refuge in Classical or Hellenistic times.

is known near Kastro 2 (37), this site is located at a strategic border pass,[753] rather than with easy access to vulnerable farming areas. It is thus more likely to be an Epidaurian defensive site than a hostile camp.

6.3.4 Conclusions: fortifications as strategic military sites

What do the five different characteristics (size, location, defensibility, construction technique, and surface material) tell us about the strategic-military role of fortifications in the Argolid? As mentioned at the beginning of this chapter, many scholars have previously attempted to understand fortified structures as part of defensive systems, but the viewshed analyses in section 6.1 and the study of movement in section 6.2 have established that extensive or systematic networks of built defences did not exist in the Late Classical and Hellenistic Argolid. Instead, the region's rural fortifications reflect a piecemeal development in which individual sites (or small groups of sites) were built in response to specific threats. Their importance is thus usually local rather than regional.

In the specific context of rural fortifications, we can identify both defences against "small-scale" conflict or raiding, and fortifications which could have played a role in the "large-scale" warfare that is at the focus of most historical narratives of the Late Classical and Hellenistic Peloponnese. Among the latter, the most prominent fortifications — both in textual sources and in the archaeological record — are the city walls, which especially from around 300 BC onwards were built, rebuilt, enlarged or strengthened at all four urban centres in the region, and are marked out by their defensive architecture as genuine workable defences.

Rural military strongholds can also belong to the level of "large-scale" warfare, although for the Argolid their use is not attested in literary sources. With their strong

[753] See section 6.2.

defences and reliable water supply, the Argive forts of Agios Adrianos (3) and Kazarma (39) would be particularly suitable as military strongholds, but most larger forts[754] and fortified settlements in the region (especially Lyrkeia (50))[755] could also have fulfilled a similar function. In contrast, towers, small forts and drystone circuits were too small to pose a sufficient threat to an invading army and instead belong to the context of relatively "small-scale" conflict and raiding.

In this context of "small-scale" conflict, fortifications were employed in various ways, none of which is attested in ancient texts. Firstly, they could serve as coastal or inland bases for small rural garrisons to protect the surrounding countryside from pirates, brigands and raids by their political neighbours. For both coastal and inland sites, visibility and reasonably efficient access are crucial, which allows us to single out the maritime fortifications of Galatas: Megali Magoula (25), Ano Phanari (10) and possibly Phourkaria (61), along with the inland sites of Anathema (8), Gyphtokastro (27), Iria (31), Kastraki (35), Kastro tis Palaiopanagias (38) and Kazarma (39), as the most promising candidates for this function.

Secondly, rural fortifications could be used to control "small-scale" movement at major routes and passes. This can most clearly be seen at the towers of Agios Sostis (5), Gymnon (26), Lileika Xeropigadou (47), Tourkovrysi (78) and Xylopyrgo (88). Thirteen further sites may also be associated with the control of movement but could equally well be located near routes for non-military reasons.[756]

Thirdly, there are the three small clusters of intervisible sites highlighted in section 6.1. The interpretation of the cluster around Kleonai (41) remains speculative,

[754] Ano Phanari (10), Gyphtokastro (27), Kastraki (35) and Kastro tis Paliopanagias (38).
[755] The only exception is Prosymna: Agios Athanasios (67).
[756] Anathema (8), Choutalaiika (18), Kastro 2 (37), Kazarma (39), Lampagiana (45), Levkakia (46), Lyrkeia (50), Phranchthi (62), Pyrgouli (71), Sporitza (74), Vigla (84), Malantrenion (101) and Xydeika (106).

but given the city's position between the major powers of Corinth and Argos it is plausible that at least the towers at Drymoni 1 (20), Drymoni 2 (94) and Spathovouni (143) could have been used to inform the city centre of "small- or large-scale" military activity, giving the population vital time to dispatch small troop contingents or withdraw behind the city walls.[757] The second cluster of intervisible fortifications, stretching from the city of Argos over the towers of Akova: Chouni (108) and Akova: Varda (6) to Tourniki: Gaidourovouni (79), has so far not been satisfactorily explained, but at least the tower at Tourniki: Gaidourovouni (79) may perhaps be connected to the small agricultural plain around modern Merkourio. The final cluster, along the Benteni valley, was probably constructed in the late 4th or 3rd century BC along the southern boundary of the Epidaurian territory and may have been used to relay information about military activity between different rural garrisons or to warn the local population. Given that most of the sites in this cluster are highly inaccessible and thus not ideally placed as bases for mobile rural troops, the latter might be more plausible.

Interestingly, two kinds of sites that are often discussed in military studies have so far not been identified in the region: ἐπιτειχίσματα and border defences constructed in the context of "large-scale" warfare. This emphasises the local rather than regional importance of most rural fortifications in the Argolid.

Together, these results provide an important step towards a better understanding of military rural fortifications on the Peloponnese and beyond.

Firstly, they demonstrate that it is highly misleading to read fortified sites though the lens of ancient authors, who focus primarily on "large-scale" warfare. Instead of illustrating "grand defensive strategies", the sites cast new light on a different, "small-

[757] This would place the sites in the context of an independent Kleonai. Whether the tower at Agios Sostis (5) belonged to Argos or Kleonai is unclear.

scale" and often local type of conflict that remains largely invisible in literary or epigraphic sources.

Secondly, it has become clear that there is no simple correspondence between architectural type and site function. For example, small- and medium-sized forts appear both as military strongholds in "large-scale" warfare and as rural bases in local conflicts.

Thirdly, the final overview of the military use of rural fortifications in the Argolid clearly illustrates that many sites were not limited to a single strategic role. For example, the fort at Kazarma (39) may have served both as a military stronghold in "large-scale" warfare and as a military base in "small-scale" conflicts. Some sites (like the fortified settlement at Lyrkeia (50)) probably even fulfilled both military and "civilian" roles at the same time. This multifunctionality may partly explain why it has been so difficult throughout the past chapters to tease apart individual site functions.

Finally, and perhaps most intriguingly, even this detailed study — examining the possible military potential of each individual site and drawing on a wealth of different comparanda, sources and methods — still leaves many rural fortifications unexplained, especially among the towers and drystone circuits. It is these sites we will need to focus on in the next chapter, when we try to understand the role of rural fortifications beyond the world of military defensive strategies.

CHAPTER 7: RURAL FORTIFICATIONS AS LOCAL DEFENCES

7.1 Conflict: fortifications as places of refuge

Pirates make for good plots — or so at least Menander thought in the 4th century BC when writing *The Sikyonians*. This play, now mostly lost, featured a certain Philoumene, an Athenian's daughter, who is kidnapped by pirates at the age of four, taken to Karia and sold as a slave at Mylasa.[758] This story may be fictional, but mirrors real-life events attested through Hellenistic honorific inscriptions. For example, a mid-3rd-century BC document from Amorgos recounts how more than 30 people, including women and children, were kidnapped by pirates and only saved by the intervention of two brothers, who persuaded their captors to liberate every free person (as well as some of the freedmen and slaves) in exchange for the payment of a ransom.[759] Such incidents were not confined to coastal areas: for example, around 100 BC a certain Lykos was make a *proxenos* at Delphi for saving young men captured by brigands, presumably while crossing the Parnassos.[760]

Both Menander's story and the incidents recorded in the inscriptions conclude happily, but they are a vivid reminder of how easily "being in the wrong place at the wrong time" could have serious consequences in the Late Classical and Hellenistic period. Such dangers were by no means limited to encounters with pirates and brigands. As noted in section 3.2, ancient warfare was essentially fought without a concept of "civilians". Taking captives for ransom or sale into slavery was common practice,[761] and

[758] Men. *Sik*. 3–7. 355–9. For further examples of pirates in Classical and Hellenistic literature, see Boulic and Létoublon 2014, 125–8.
[759] *IG* XII. vii 386 (3rd century BC). Pritchett 1991b, 277; De Souza 1999, 61; Austin 2006, 204.
[760] Fouilles de Delphes III 1 457. Pritchett 1991b, 282. Other incidents are collected by Pritchett 1991b, 324–48. According to Plut. *Arat.* 6.1, brigandage was also common in the 3rd-century BC Argolid.
[761] For a collection of examples, see Pritchett 1991b, 223–97.

both the defeated themselves and their property were considered the rightful spoils of the victor.[762] For those members of a city who resided temporarily or permanently outside the urban centre (for example on the numerous farmsteads mentioned in section 5.2), these threats must have been all the more pressing, especially since the city-states in the Argolid did not generally pursue a policy of stopping invasions at territorial borders.

So how did the rural population of the Late Classical and Hellenistic Argolid cope with this constant threat of property loss, enslavement or even death? One option was to flee from conflict and take refuge elsewhere. This practice is archaeologically difficult to trace, but widely attested in written sources, which tell us that the occupants of rural Greece not only evacuated their women, children, slaves and livestock, but also regularly transported movable farm-equipment, household furnishings, food and crops to places of refuge.[763] Even the woodwork of houses could be removed for safekeeping,[764] and in some cases troops were employed to harvest and gather important crops.[765]

These testimonies prompt the question of where a rural population might seek refuge in the 4th century BC or the Hellenistic period. One possibility was to flee to a friendly neighbouring city-state, either overland or by sea.[766] This must have been a common practice, since many treaties include provisions granting ἀτέλεια (freedom from import and export duties) to temporary refugees.[767]

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[762] Rihill 1993, 79; Krentz 2007, 180–1; Ducrey 2016, 332–3. Xen. *Hell.* 4.7.6, for example, mentions that Cretan troops ravaged Nafplio during Agesipolis' campaign in 388 BC.
[763] Müller 1975, 131–44; Pritchett 1991b, 348–52; Hanson 1998, 104–110; Chandezon 2003, 26–7.
[764] Thuc. 2.14. Hanson 1998, 108.
[765] Shear 1978, 19–21; Hanson 1998, 104–5; Chaniotis 2005, 121–2. For example, the Athenian Kallias of Sphettos was honoured in 287 BC for leading soldiers into the countryside to protect the grain harvest during the war against Demetrius Poliorketes (*SEG* xxviii 60, 27–7 (279/69 BC)).
[766] A famous 5th-century BC example is the Athenian evacuation of livestock to Euboia and the adjacent islands in 431 BC (Thuc. 2.14.1).
[767] Müller 1975, 131–156; Pritchett 1991b, 348–9; Chandezon 2003, 185; Chaniotis 2005, 125–6. 128.

A second option was to take refuge in naturally inaccessible areas. For example, Xenophon notes that prior to the Spartan invasion in 390 BC the Corinthians moved their livestock to the mountainous Piraion peninsula for safekeeping,[768] while in 389 BC the Akarnanians drove their herds into the mountains to keep them out of the reach of Agesilaos' plundering troops.[769]

Fortified structures provided a third possible category of refuge. As we might expect, written sources focus on urban fortifications,[770] where evacuations may have been subject to specific rules or regulations.[771] However, we also know that rural fortifications such as forts or second-order settlements were considered as possible places of refuge.[772] A further group of structures that are not explicitly mentioned in written sources, but which are often discussed as possible refuges, are the simple drystone circuits that are scattered on hilltops throughout the Greek countryside.[773]

The most detailed surviving descriptions of evacuations into rural forts come from Attica. Two sources, a passage from Xenophon's *De Vectigalibus* and a 3rd-century BC honorific inscription from Rhamnous, are particularly informative. In the first text, Xenophon outlines a defensive plan for a hypothetical attack on the mining area at Laurion. He notes the existence of two fortifications at Anaphlystos and Thorikos and suggests the construction of an ἔρυμα (possibly a drystone circuit)[774] at Besa to ensure

[768] Xen. *Age.* 2.18; Xen. *Hell.* 4.5.1.
[769] Xen. *Hell.* 4.6.4.
[770] See D. S. 17.4.6 for an example from 4th-century BC Athens. If the so-called "Callisthenes Decree" (quoted in Dem. 18.37–8 as stating that no Athenians other than the rural garrisons were to remain outside Athens or the Piraeus at night) is genuine or reflects genuine Athenian legislation (as Hanson 1998, 113 suggested), it may belong to a similar context. However, the document is usually regarded as a later forgery (Droysen 1893, 204–11; Schläpfer 1939, 43–6; Wankel 1976, 288–9; Canevaro 2013, 243–9).
[771] For example, Aen. Tact. 10. recommends banning slaves and livestock from the city.
[772] One example is the fort of Thalamai in Elis, which served as a place of refuge in 219 BC (Polyb. 4.75.2–8).
[773] McCredie 1966, 92–3; Hanson 1998, 112; Fachard 2012, 252–3. These structures are often referred to by the German term "Fluchtburgen".
[774] Fachard 2012, 284.

that "every man would have but a short distance to safety". The distance between the three sites measures roughly 5–6 km.[775] The second source is an inscription honouring the Athenian general Epichares, who "saved the fort (i.e. Rhamnous) for the people during the war (i.e. the Chremonidean War) and gathered in the crops and fruits within a range of 30 stadia (ca. 5.5 km)", as well as providing protection for vines and additional guard dogs.[776] What is striking about these two sources is that the radius of the operations at Laurion and Rhamnous is remarkably consistent (around 30 stadia).[777] Taking into account the varying topography of Attica, this translates into a "walking distance" of ca. 1–1.5 hours (**figure 147**).

This pattern helps to evaluate the potential of the Late Classical and Hellenistic rural fortifications in the Argolid as places of refuge.[778] In the previous chapter, "walking distances" were estimated around the different urban centres in the region (Argos, Epidauros, Halieis, Hermion and Troizen), as well as their neighbours. Looking back at the **figures 128–30**, this demonstrated that each political centre controlled areas beyond the 1.5-hour radius that was considered feasible for evacuations in 4th- and 3rd-century BC Attica.

Besides the urban centres themselves, the Argolid offers three types of rural fortifications that could have served as places of refuge in times of conflict: secondary fortified settlements (including formerly independent centres like Kleonai), forts, and drystone circuits. In the case of the drystone circuits, a use as temporary refuges rather

[775] Xen. *Vect*. 4.44. For a discussion of this passage, see Lauffer 1979, 223; Fachard 2012, 283–5.
[776] *SEG* xxiv 154 (264/3 BC). Hanson 1998, 105; Chaniotis 2005, 121; Austin 2006, 132–5; Fachard 2012, 284–7.
[777] Fachard 2012, 285.
[778] Fachard 2012, 288–92 applied a similar approach to the fortifications of Eretria, although working with Euclidian measurements rather than "walking distances".

than for permanent or even seasonal habitation would account for the scarcity of surface finds noted in the previous chapter.

Of course, not all sites belonging to these three types could have sheltered the entirety (or even large parts) of the population that cultivated the land within 1.5 hours. As noted in section 3.2, many forts and drystone circuits are surprisingly small, even in comparison to ancient rural fortifications elsewhere.[779] Considering that ancient evacuations often included livestock and movable property as well as entire households, fortifications of less than 0.1 ha were probably too small to provide refuge for the rural population beyond the immediate vicinity of the site.[780] For example, with a size of merely 0.05 ha the drystone circuit at Vigla (84) may have sheltered the inhabitants of the nearby unfortified settlement of Agios Ioannis, but probably not from further afield.[781] Structures like Prosymna: Agios Athanasios (67), which are easily accessible and lack strong natural or built defences (**figure 148**),[782] can similarly be excluded from the possible refuge sites.

Calculating the 1.5-hour radius around the remaining fortified settlements, forts and drystone circuits, as well as the "cost boundaries" between the individual sites

[779] See for example the rural forts and drystone circuits in the territory of Eretria (Fachard 2012, 242. 251–2).

[780] The following fortifications enclose areas of up to 0.1 ha: Anathema (8) (0.03 ha), Iria (31) (0.03 ha), Agio Lias (2) (0.05 ha), Galatas: Megali Magoula (25) (0.1 ha), Soros (72) (0.05 ha), Vigla (84) (0.05 ha) and probably Kantia 1 (33). Porto Cheli (64) (ancient Halieis) is also excluded from the following analysis, not on the grounds of its size, but because it was abandoned for most of the period studied in this chapter. In terms of number of people involved, rural evacuations are very difficult to quantify. Ancient authors occasionally give specific figures (for example Liv. 27.32.7 mentions 4000 people and 20000 livestock at Pyrgos and Poly. 4.75.28 speaks of more than 5000 people and their livestock at Thalamai), but it is unclear if these numbers are reliable. In addition, the places of refuge mentioned in the two examples have never been identified, making it impossible to compare the number of people and livestock with a fortified area.

[781] For the settlement at Agios Ioannis and its relationship to Vigla (84), see Jameson et al. 1994, 508–10.

[782] For the defensibility of Prosymna: Agios Athanasios (67), see section 6.3.3. Another criterion to consider is water supply, but as discussed in the previous chapter, this has so far proven difficult to reconstruct.

reveals that the fortifications are not equally distributed throughout the region (**figure 149**). Differences in chronology or territorial boundaries probably account for the close proximity of Lyrkeia (50) and Sporitza (74) or Kazarma (39) and Kastraki (35),[783] but even so the distance between the remaining sites is far from consistent. As a result, much but by no means all of the region falls within 1.5 hours of the nearest possible refuge site. For example, the inhabitants of the central Argive territory, of the valley between the Saronic and the Argolic Gulfs and of the southern Akte had particularly good access to major fortifications, unlike the Argives living in the Thyreatis and the Kynouria, where such sites are far more dispersed. This suggests that the aim of the Argolid's rural fortifications was not to provide places of refuge systematically for the entirety of each city's territory, but only in particular areas.

But what determined which areas were provided with fortified places of refuge? Most "refuges" (or rather, most areas within 1.5 hours of these refuges) have several features in common, which might help to answer this question. Firstly, most areas within 1.5 hours of a possible refuge site fall below 500 mamsl, while areas above this altitude are usually avoided (**figure 150**). As today, 500 mamsl was probably the maximum altitude at which olives prospered in antiquity.[784]

Secondly, the majority of the ancient rural agricultural installations that were mapped in section 2.3 — olive mills, press beds and press weights — were found within 1.5 hours of a possible refuge (**figure 151**). The only exceptions are the olive mill at the tower of Iliopoulaiika (30), the press weight at the tower of Kampia (32), three olive mills near at the site of Tourkopigadou (158) and an olive mill on the northwestern coast of the Argolic Gulf.

[783] For the date of Lyrkeia (50) and Sporitza (74), see chapter 4, for the territorial boundaries at Kazarma (39) and Kastraki (35) section 6.3.3.
[784] See section 2.3.

Thirdly, the area within 1.5 hours of one or several fortified settlements, forts or drystone circuits largely coincides with the modern agricultural zone in the region (**figure 152**). Although these areas were not necessarily cultivated in antiquity,[785] nearly all possible refuge sites are thus located in landscapes in which agriculture may have been feasible.[786]

All three observations reveal a close correlation between major fortified sites and areas of cultivation, suggesting that the fortifications could have provided shelter for an agricultural population in times of conflict. That is not to say that every fortified settlement, fort or drystone circuit in the region was constructed principally as a temporary refuge site. For example, the forts at Agios Adrianos (3), Kazarma (39), Kastraki (35) and Ano Phanari (10) were probably built primarily to house garrisons,[787] but nevertheless could have played a role during rural evacuations. As discussed in the previous chapter, the volume of the cisterns at Agios Adrianos (3) and Kazarma (39) probably exceeded the needs of the local garrisons and may have been sufficient to supply additional people staying at the forts on a temporary basis. This could support an identification of the sites as temporary refuges as well as military-strategic fortifications.

Interestingly, there are some exceptions to the usual correlation of major fortified sites and agricultural areas (**figures 150–2**). Some areas were suitable for agriculture, but probably not within 1.5 hours of a possible place of refuge, while in other parts of the region forts or drystone circuits are found outside the possible cultivated zones. Starting with the latter, three sites (the drystone circuits at Kastro 2 (37) and Vigliza (85) and the fort at Kastro tis Paliopanagias (38) in the Kynouria) are located above an altitude of

[785] For landscape changes since the Hellenistic period, especially the loss of upland soils and the possible lack of agricultural terraces, see chapter 2.
[786] For the modern land use in the region, see https://land.copernicus.eu/pan-european/corine-land-cover/clc-2012 (13/8/2018).
[787] See chapter 6.

500 mamsl, where there are no archaeological indications of ancient agriculture. Around two of these sites (Kastro 2 (37) and Vigliza (85)), as well as the Epidaurian forts at Gyphtokastro (27) and Stavropodio (75), extensive modern cultivation is also largely lacking.[788]

For three of these sites, the location strongly suggests a military-strategic function. The drystone circuit at Kastro 2 (37) is situated on a pass into the Epidaurian territory (**figure 153**), while the forts at Gyphtokastro (27) and Stavropodio (75) may be part of a visual network on the southern border of Epidauros. In all three cases, the location thus seems to be determined by military-strategic considerations, rather than by the desire to provide places of refuge for the surrounding countryside.

At Kastro tis Paliopanagias (38) and Vigliza (85), the situation is less clear. Very little is known about the fortification at Kastro tis Paliopanagias (38), partly because of the current state of research and partly because Medieval occupation and modern vegetation largely obscure any earlier structures.[789] Owing to the lack of interior buildings, the site was typologically classified as a fort in chapter 3, but based on the remains published to date or visible at the site, it is impossible to distinguish whether we are looking at a fortified settlement, a military-strategic fort or (as W. K. Pritchett suggested) a refuge site.[790] Until further research has taken place, the function of Kastro tis Paliopanagias (38) therefore remains unknown.

The fortification at Vigliza (85) was investigated during the *Berbati-Limnes Survey*, but remains nearly equally difficult to interpret. The site consists of a small drystone circuit, measuring ca. 0.15 ha and enclosing a number of rectangular rubble

[788] The area around Vigliza (85) shows signs of intensive terracing, probably dating to the first Venetian period (Wells 1996, 9), but the terraces are now largely abandoned.
[789] For the Medieval structures at Kastro tis Paliopanagias (38), see Μπάλλα 2002, 199–200. The only part of the ancient fortification that is visible today is a stretch of circuit wall in large drystone blocks.
[790] Pritchett 1991a, 164–5.

foundations of uncertain date (**figures 154–5**).[791] It is located on a small plateau, not far from two possible routes between the Argolid and the Korinthia.[792] What really stands out at this site is the composition of the surface finds. Looking at different functional categories, the Classical and Hellenistic ceramic assemblages from the *Berbati-Limnes Survey* are quite heterogeneous,[793] but even so the pottery from Vigliza (85) (**figure 156**) is unusual.[794] It shows an uncommonly low percentage of fine-wares (a mere three sherds or 13.63 % of the total assemblage), and a surprising absence of drinking and storage vessels. Instead, it includes an unusually high number of sherds from transport amphorae (five sherds or 22.7 % of the assemblage) and household vessels, especially large open shapes like lekanai and mortaria (six sherds or 27.3 % of the assemblage).[795] In addition, the site lacks querns and loomweights, which are otherwise common in the region.[796]

This surface assemblage has no parallels in the *Berbati-Limnes Survey*, although some features, like the low percentage of fine-wares and drinking vessels or the absence of storage pottery, seem to be more common in the eastern than in the western part of the survey area and may thus form part of a wider regional pattern.[797] Even beyond the survey, parallels for Vigliza's (85) pottery assemblage are rare, but one site that has some similarities in terms of the functional pottery categories is the *NVAP*'s "site 7", with a

[791] Penttinen 1996a, 268.
[792] See section 6.2.
[793] For the Classical and Hellenistic surface finds from the *Berbati-Limnes Archaeological Survey*, see Penttinen 1996a, 231–71, for the division of pottery into different functional categories, see Cloke 2016, 509.
[794] For the surface finds at Vigliza (85), see Penttinen 1996a, 268–70.
[795] In addition to the pottery published by Penttinen 1996a, 268–70, several fragments of tile and coarse-wares (including the rim of a lekane and a vertical handle in coarse Corinthian fabric) were observed on site in August 2016.
[796] For loomweights and querns discovered in the *Berbati Limes Archaeological Survey*, see Penttinen 1996a, 272–3. 276–7.
[797] For a low percentage of fine-wares, see also findspots 41 and 307 (Penttinen 1996a, 267–8. 270–1), for the absence of drinking vessels, see findspots 41, 307 and possibly 411 (Penttinen 1996a, 259–60. 267–8. 270–1) and for the absence of storage vessels, see findspots 307 and 504, although the assemblage at findspot 307 may include a pithos lid (Penttinen 1996a, 252. 267–8). With the exception of findspot 411 and 505, all these sites are located in the eastern part of the survey area.

lack of Hellenistic drinking and large storage vessels and an unusually high percentage of transport amphorae (**figure 157**). This site is probably a hamlet, located in a part of the valley that may have been used for pastoralism, but some features of the find assemblage (such as the high percentage of transport amphorae) remain unexplained.[798]

In the absence of clear parallels, what does the pottery at Vigliza (85) reveal about the fortification's functions? Firstly, the site clearly does not have the usual "ceramic signature" of ancient farmsteads, which is characterised by a combination of fine wares, domestic coarse wares and storage vessels.[799] The drystone circuit at Vigliza (85) is thus unlikely to be part of a "ordinary" Hellenistic farmstead.

Secondly, the pottery assemblage is strikingly different from what we would expect from a military-strategic site, which usually includes an abundance of drinking vessels.[800] Vigliza (85) is therefore probably not part of a line of Argive territorial defences.[801]

Thirdly, the presence of household pottery, especially the leg of a cooking tripod, suggests at least temporary occupation at the site, while fragments of tile attest the existence of permanent or semi-permanent structures. At the same time, the large percentage of amphorae within the ceramic assemblage reveals an emphasis on portable storage, suggesting either that the commodities kept in the amphorae were not produced locally or that Vigliza (85) was only occupied temporarily.

One context that could have produced Vigliza's (85) composition of surface pottery is pastoralism. For example, the drystone circuit could have been used to protect flocks at certain times of the year or in periods of conflict.[802] This would explain why

[798] Cloke 2016, 162–3. 540–73. For pastoralism in the valley, see Cloke 2016, 305.
[799] For the "ceramic signature" of ancient farmsteads, see McHugh 2017, 57–9.
[800] Penttinen 2005, 93. For the drinking vessels at the fort of Phylla on Euboia, see Sapouna-Sakellaraki et al. 2002, 92–5.
[801] For an interpretation of Vigliza (85) as a military-strategic site, see Penttinen 1996a, 270. 281.
[802] A connection to pastoralism was briefly suggested by Penttinen 2005, 115.

certain features of the ceramic assemblage are mirrored at other, non-fortified sites in this particular part of the region or at "site 7" in the Nemea valley. Seeing Vigliza (85) as a primarily pastoralist site would also account for its location outside the possible agricultural areas of the Argive territory.

Moving on from fortifications outside the cultivated zones of the region, there are four possible agricultural areas in the territories of Epidauros and Argos that do not fall within 1.5 hours of a major fort, fortified settlement or drystone circuit: the coastal plain of Iria, the small inland plain of Dimaina, the eastern Inachos valley and large parts of the western Argolid (**figures 150–2**).

Three caveats need to be raised. Firstly, it is impossible to exclude the possibility that fortified places of refuge once existed in these areas, but no longer survive. Simple drystone circuits, which are difficult to recognise on the ground, may furthermore simply have been missed by scholars so far or may have been misidentified as earlier or later structures. Secondly, the inhabitants of the areas that lack major Classical or Hellenistic fortifications may have made use of naturally defensible locations or even pre-Classical fortifications in times of conflict. For example, two Mycenaean fortifications (Kastraki Dimainas and Vassa) survive on the hills bordering the plain of Dimaina.[803] Depending on their preservation in the Classical and Hellenistic periods, these sites could have functioned as refuges in times of conflict, but especially if they were used primarily for livestock, this may have left no archaeological traces. Thirdly, the extent of ancient agricultural areas may obviously have differed from the area that is under cultivation today. However, at least in the western Argolid wine or olive presses attest agricultural activities in antiquity.[804]

[803] For these two sites, see Φαράκλας 1972a, E. 3.1–2.
[804] See section 2.3.

In most "agricultural areas" that lie beyond 1.5 hours from the nearest major fortification, we have comparatively little Late Classical or Hellenistic archaeological evidence. For example, none of the areas has ever been investigated in an intensive surface survey. Although rural settlement patterns thus remain largely unclear, an intriguing pattern emerges if we compare the "agricultural areas", the 1.5-hour-radius around major fortifications and the distribution of ancient towers in the region. We can see that the majority of known towers are located beyond or at the edge of the 1.5 hours-radius around the fortified settlements, forts or drystone circuits (**figures 150–2**). This pattern is even more striking if we take into account that not all fortified sites in the Argolid are contemporary. Ancient Mycenae was only resettled and refortified in the 3rd century BC,[805] while many of the nearby towers may belong to the 4th century BC.[806]

There are of course exceptions to this overall pattern, especially towers that are located near primarily military sites[807] or that may themselves have had a strategic function.[808] Nevertheless, the correlation between towers and possible agricultural areas beyond the distance of 1.5 hours' walk around the major fortifications seems too pronounced to be merely coincidental. It appears to point to a possible connection between rural towers and agriculture and may suggest that on a more local level many towers fulfilled the same functions as the larger fortifications, perhaps serving as refuges for individual households or protecting sites of agricultural processing.

[805] Wace et al. 1923, 417; Schilbach 1975, 101; French 2002, 147; Iakovides and French 2003, 27.
[806] For the chronology of polygonal masonry, see chapter 4, for Classical surface finds, see, for example, Phichtia: Limiko (58) (Scranton 1938, 538; Brommer 1975, 171) and Kapsala (96) (Iakovides and French 2003, 41).
[807] For example, Ano Phanari: Vigliza (11) near the fort of Ano Phanari (10), Tou Antreionemou tou Mnema (77) near Stavropodio (75) or Pyrgouli (71) near Kazarma (39).
[808] For example, Xylopyrgo (88). Other exception are Ermioni: Magoula (93), where the identification as tower is uncertain (Jameson et al. 1994, 502–3) and the towers at Drymoni, which are probably connected to the nearby quarries (Marchand 2002b, 312. 326).

To sum up this discussion, the Argolid shows a remarkable correlation between possible agricultural areas and access to forts, fortified settlements or drystone circuits. Many of these fortifications, including those with a principally military-strategic focus, probably served as places of refuge for the local rural population. As the site at Vigliza (85) suggests, the practice of using fortified refuges may have extended into areas in which pastoralism predominated.

In those parts of the region that could be cultivated but lie beyond 1.5-hours from the major fortified sites, there is an unusually high number of towers. Besides indicating that these minor structures may have served as "small scale refuges", this pattern may contribute to the ongoing debate of how and how far we can distinguish domestic "farm" towers from strategic-military structures, a point discussed in detail later in this chapter.

The current chapter thus offers one possible interpretation for many fortified settlements and drystone circuits that were so far unexplained, as well as adding new "non-military" facets to primarily strategic sites. If the conclusions drawn here are correct, they have two implications for the wider study of rural fortifications.

Firstly, the focus of research should shift away from viewing rural fortified structures principally as part of a city-state's territorial defences and towards analysing the sites as local fortifications, making agricultural areas and pastoralist practices key to understanding the function of individual sites.

Secondly, the discussion reveals the multifunctionality of ancient fortifications, demonstrating that not only particular types of fortified structures (e.g. "rectangular towers" or "drystone circuits") but also individual sites could simultaneously serve both as local and as territorial defences. At least for major sites such as forts, military-strategic and "civilian" functions should therefore not be seen as mutually exclusive.

These two conclusions throw open an important question: Who was responsible for the construction of rural fortifications in the Argolid and beyond? As we have seen, many fortified sites seem to play a predominantly local rather than regional defensive role. At the same time, the rural territory around the fortifications did not exist in isolation but was economically and socially intertwined with life in the urban centre.[809] Studying rural fortifications with a particular focus on their local function may thus offer new glimpses of the relationship between the urban and the rural population of the Late Classical and Hellenistic Peloponnese, a topic we will return to at the end of this chapter after discussing the agricultural role of rural fortifications in more detail.

7.2 Cultivation: fortifications and agriculture

a) Studying "agricultural" fortifications: four criteria

The idea that rural fortifications could be connected to agricultural and non-agricultural production is by no means new, but due to the low visibility of dispersed habitation outside surface surveys, nucleated settlements such as the *asty* or rural *komai* were long seen as the main places of residence for the agricultural population of a Greek city-state.[810] Especially before the 1970s, discussions of the rural economy thus often centred around the fortified settlements. Scholars have generally studied minor fortifications rather differently (traditionally with a very strong military-strategic focus), but now few archaeologists would dispute that towers could serve as agricultural sites in the Late Classical and Hellenistic period.[811]

However, two key questions remain. Firstly, how can we distinguish between fortifications with a strong agricultural role and those that were primarily built as

[809] See section 5.2.
[810] See, for example, Finley 1977, 305.
[811] Morris and Papadopoulos 2005, 162–3. For a brief summary of the history of the scholarship on this subject, see section 3.2.

strategic-military sites? And secondly, can we take the interpretation of rural fortifications one step further and place them in their wider social and economic context rather than merely distinguishing agrarian and non-agrarian sites? For example, should we try to understand rural towers with agricultural functions as "family-farms" or as part of large estates worked mainly through unfree labour? These are the two questions addressed in this final section.

To begin with the identification of "agricultural" fortifications, we can draw on four different criteria that have already been mentioned in passing in the preceding chapters: the sites' architecture, their location, the presence of agricultural or "industrial" installations, and the small finds recorded at the fortifications. In most cases, any one of these criteria is on its own insufficient to identify a site as "agricultural" and a clear picture only emerges when several criteria are considered together.

b) Criterion 1: architecture

The first criterion, the architecture, is particularly useful in the case of "rural" towers, i.e. towers that are not part of larger fortifications such as forts or city walls. When discussing "rural towers", we should distinguish between two very different groups of structures. The first group are the freestanding towers, which can occur on their own or associated with outbuildings and enclosure walls. Most towers in the Argolid belong to this group.[812]

[812] See chapter 3. Adjacent buildings and enclosure walls are often constructed in poorer quality materials (Lawrence 1979, 189; Munn 1983, 36; Lohmann 1993, 156–8; McHugh 2017, 61–2) and are thus less likely to survive than the towers themselves. In the Argolid, the following towers are associated with further buildings: Ano Phanari: Vigliza (11) (with a retaining or enclosure wall to the northwest), Elliniko: Kephalari (23) (where a 3.4 m long and 0.6 m wide foundation wall runs from the entrance of the tower towards the east (Fracchia 1985, 686)), Kantia 2 (34) (where a corner of a rectangular building in polygonal masonry was recorded to the northwest of the two towers (Gebauer 1939, 293–4)), Kephalovryso (40) (surrounded by a circuit or terrace wall in drystone masonry), Kophy Rachi (42) (surrounded by a drystone circuit or terrace wall enclosing an area of ca. 25 by 30 m (Jansen 2002, 95)), Lampagiana (45) (with a rectangular building immediately to the west (Jameson et al. 1994, 507–8)), Lileika Xeropigadou (47) (with additional buildings, perhaps of a different date, and a circuit wall (Φάκλαρης 1990, 201–3)), Limanaki 1 (48) (with a rectangular terrace or circuit wall measuring ca. 15 by 20 m), Phichtia: Paliopyrgos (59) (with a possible drystone enclosure, measuring ca. 15 by 20 m (Jansen 2002,

The second group are "towerhouses". These structures usually resemble a typical Greek *pastas* house, except that one room carries additional storeys to form a tower.[813] They are generally interpreted as "farmhouses" or "country residences" of the wealthy elite rather than as military-strategic sites.[814] The only structure in the Argolid that may belong to this group is the 3rd-century BC building at Marmaralono Agiou Petrou (102) in the Kynouria (**figures 158–9**). Based on the width of the walls (ca. 0.95 m), Π. Φάκλαρης suggested at least one upper storey and proposed an interpretation as a tower. However, with a size of ca. 15 by 15 m this structure would be unusually large among the freestanding towers in the Argolid.[815] Since its eastern part is divided by an east-west wall, it is possible that only one room originally carried one or several upper storeys, creating a building similar to the towerhouse at Vari in Attica.[816] If this hypothesis is correct (which admittedly is difficult to verify without further excavation), this would argue for an interpretation of the "tower" as a farmstead or wealthy rural residence rather than as a strategic-military site.[817]

Returning to the freestanding towers, their entranceways may hold clues to their original function. It has long been observed that many ancient towers are difficult to access, which enhances their defensibility. For example, entrances are often located

80)), Prosymna: Pyrgouthi (69) (with several adjacent buildings, probably dating to the Late Hellenistic or Early Roman period (Penttinen 2005, 38–40)), Tourniki: Gaidourovouni (79) (possibly with a circuit or terrace wall in drystone masonry (Πίκουλας 1995, 203)), Kondyli (98) (with an adjacent rectangular building), Xydeika (106) (with remains of two rectangular structures in polygonal masonry and a 200 m long wall (Πιτερός 2004c, 63)) and Mathi (135) (with a courtyard in "cyclopean" masonry, now destroyed (Steffen and Lolling 1884, 18)).

[813] Jones et al. 1973, 438; McHugh 2017, 62.

[814] See, for example, McHugh 2017, 71–3.

[815] For the description and dating of this structure, see Φάκλαρης 1990, 127–9; Shipley 1996, 280. The only catalogued sites comparable in size are the rectangular tower at Tou Antreiomenou to Mnema 1 (77) (measuring 12.2 by 14.8 m), the tapering towers at Elliniko: Kephalari (23) and Lygourio 1 (49) (which will be discussed in more detail below), and the structure at Tourniki: Agios Nikolaos sta Ampelia (105). For the last sites, the identification as a tower is uncertain.

[816] With a size of ca. 13.7 by 17.7 m (Jones et al. 1973, 421), this towerhouse is only slightly larger than the structure at Marmaralono Agiou Petrou (102).

[817] A function as a rural residence was already suggested by Φάκλαρης 1990, 128, drawing on parallels in eastern Macedonia.

above ground-level or lead into ground-floor rooms that are only connected to the upper storeys by a trapdoor.[818] However, among the towers in the Argolid, entrances above ground-level are rare, with only two certain examples[819] compared to twelve towers with surviving ground-floor entrances.[820] In most cases, ease of access was thus prioritised over defensibility. This does not necessarily argue for a non-military function, but does suggest that the structures were used frequently enough to justify the loss of defensibility.

Looking more closely at cuttings and wear marks on door jambs, lintels and thresholds, S. Morris and J. Papadopoulos have recently suggested that many towers on the islands were originally designed to be locked from the outside. Based on this observation (as well as the economic contexts of the structures) they argued that some towers on the islands served as "lock-ups" for slaves working in nearby mines or vineyards.[821] However, the surviving entranceways in the Argolid tell a rather different story. At eight towers enough remains of the thresholds, door jambs or lintels to reconstruct the structure of the door or closing mechanism.[822] The rebating around the doorframes shows that all known doors opened inwards and in six cases a cutting for a doorpost survives in the threshold or lintel (**figure 160**).[823] At Lygourio 1 (49), even the

[818] See, for example, the tower of Agios Petros on Andros (Morris and Papadopoulos 2005, 188).
[819] The entrance to the tower at Akova: Varda (6) is located ca. 1.9 m above the present ground level (Πίκουλας 1995, 199). The entrance at Pyrgouli (71) has not survived, but since the walls of this tower survive up to a height of 2.4 m, a ground-level entrance can be excluded.
[820] Ground-floor entrances have survived at Charadros (17), Elliniko: Kephalari (23), Iliopoulaiika (30), Kampia (32), Krya Vrysi: Marmarakia (43), Lygourio 1 (49), Nera (53), Phichtia: Limiko (58), Prosymna: Pyrgouthi (69) and Tou Antreiomenou to Mnema 1(77), and are furthermore recorded at Kantia 2 (34) (Gebauer 1939, 293) and Tourniki: Gaidourovouni (79) (Πίκουλας 1995, 203). All remaining towers are not preserved to a sufficient height to determine the location of the entranceways.
[821] Morris and Papadopoulos 2005, 188–200.
[822] Charadros (17), Elliniko: Kephalari (23), Kampia (32), Krya Vrysi: Marmarakia (43), Lygourio 1 (49), Phichtia: Limiko (58), Prosymna: Pyrgouthi (69) and Tou Antreiomenou to Mnema 1 (77).
[823] Charadros (17), Elliniko: Kephalari (23), Krya Vrysi: Marmarakia (43), Lygourio 1 (49), Phichtia: Limiko (58), Prosymna: Pyrgouthi (69). At Prosilia (66) a threshold or lintel survives, but is not *in situ*. Intriguingly, Charadros (17) only has a cutting for a doorpost in the lintel, but not the threshold.

lead socket for the doorpost was preserved (**figure 160 d**).[824] Most doorposts are placed on the left side of the door (looking from the inside of the tower to the outside), with the exception of the inner door at Elliniko: Kephalari (23), which opened to the right, presumable to lie against the interior wall when open. Some doors could be locked from the inside with a crossbar held by a large square cutting in one of the doorjambs (usually on the left-hand side, irrespective of the position of the doorpost (**figure 161–2**)),[825] others with vertical fastenings.[826] At the tower at Charadros (17), there is a cutting for a doorpost, but none for a fastening, suggesting that the door was originally fitted in a wooden frame.

The construction of the doors and locking mechanisms thus varies, but none of the towers shows cuttings on the exterior of the doorframe that would suggest a locking mechanism on the outside. Compared to the surviving doorways at "major" sites such as forts and fortified settlements, the doors at the towers are similar in construction, but often less substantial. For example, the entrance to the central tower at Agios Adrianos (3) (though similar in width to the doorways at Charadros (17) and Prosymna: Pyrgouthi (69))[827] had a substantially larger doorpost and was fastened by a double crossbar (**figure 163**).[828] Although the rural towers are still impressive defensible structures, less emphasis was thus placed on the fortification of entranceways than at contemporary forts.

[824] Lord 1938, 516.
[825] Such cuttings are preserved at the interior and exterior door of Elliniko: Kephalari (23), at Kampia (32), Krya Vrysi: Marmarakia (43) and Tou Antreiomenou to Mnema 1 (77) (where they are unusually placed on the right-hand side of the door). No tower preserves a corresponding cutting on the opposite doorjamb. In addition to the large square cuttings for the crossbar, the doors at Elliniko: Kephalari (23) and Kampia (32) also preserve several smaller rectangular cuttings. Their purpose is unclear.
[826] Phichtia: Limiko (58) (Lord 1938, 491).
[827] The doorway at Agios Adrianos (3) is ca. 0.95 m wide (Schilbach 1975, 56), compared with a width of 0.85 m for the doorway at Prosymna: Pyrgouthi (69) (Penttinen 2005, 59) or 0.83 m at Charadros (17) (Φάκλαρης 1990, 206).
[828] The cutting for the doorpost in the lintel at Agios Adrianos (3) measures ca. 0.15 by 0.15 m and is ca. 0.1 m deep (Schilbach 1975, 56). In contrast, the doorpost at Prosymna: Pyrgouthi (69)

Staying with the architecture of rural fortifications, two 4th-century BC sites — the "pyramids" of Elliniko: Kephalari (23) and Lygourio 1 (49) — have in the past attracted particular attention (**figures 164–5**).[829] Each structure originally consisted of a rectangular mudbrick tower on a tapering polygonal masonry base.[830] A similar tapering base was also used for the circular tower at Agios Sostis (5), also dated to the 4th century BC (**figure 166**).[831]

Various explanations for the bases of these towers have been proposed, especially for the well-preserved example at Elliniko: Kephalari (23). Most scholars have focused on possible military advantages of sloping walls. For example, walls of this shape may have prevented the use of siege engines or reduced the area that was invisible to the

measured only ca. 0.11 by 0.12 m (Penttinen 2005, 59) and the circular hole in the lintel at Charadros (17) ca. 0.08 m in diameter (Φάκλαρης 1990, 206).

[829] A third comparable structure was reported east of Argos at Dalamanara (131), but no longer survives (Λάζος 1995, 56–61; Πιτερός 1997a, 362–67; 1997b, 490). As Παππάς 2006 has shown, the tower at Kampia (32) did not have a pyramidal base (as previously suggested by Πιτερός 1995b, 113). In early scholarship, the "pyramids" at Elliniko: Kephalari (23) and Lygourio 1 (49) were often interpreted as funerary monuments (Leake 1830a, 344; Ross 1841, 142–5; Leake 1846, 251; Vischer 1857, 325–28; Clark 1858, 98–108), but Th. Wiegand's and L. Lord's excavations in 1901 and 1937 demonstrated that the "pyramids" were built as fortified structures (Wiegand 1901; Lord 1938, 496–527). For the date of Elliniko: Kephalari (23) and Lygourio 1 (49), see chapter 4.

[830] For previous research on the "pyramid" of Elliniko: Kephalari (23), see Cockerell 1830, 23; Leake 1830a, 338–9; Ross 1841, 138–145; Mure 1842, 195–7; Leake 1846, 344; Curtius 1852, 365–6; Forchhammer 1857, 6; Vischer 1857, 326–8; Clark 1858, 98–100; Conze and Michaelis 1861, 22–3; Bursian 1872, 65; Tsountas and Manatt 1897, 38–9; Frazer 1898, 212–4; Wiegand 1901, 241–6; Lord 1938, 496–510; Scranton 1938, 538; Lord 1939, 80; Young 1956, 144; Oppermann 1971, 46–52; Nowicka 1975, 31; Παπαχατζής 1976, 181–3; Adam 1982, 72. 74–5; Fracchia 1985, 686; Foley 1988, 184; Πέππα 1990, 162–3; Πίκουλας 1990, 257 (no. 10); Λάζος 1995, 19–44; Πίκουλας 1995, 208–9; Πιτερός 1996a, 95; 1997a, 344. 347–59. 367–71; 1997b, 489–90; Tausend 1998; 2006, 121 (a photograph of the site is reproduced by Morris and Papadopoulos 2005, 164 figure 11, but mislabelled as "Kephalari (Kandia)"). For Lygourio 1 (49), see Lord 1938, 511–27; Scranton 1938, 528–38; Lord 1939, 78–84; 1941, 112; Oppermann 1971, 48. 51–2; Παπαχατζής 1976, 193–4; Fracchia 1985, 687–9; Λάζος 1995, 45–55; Πιτερός 1997a, 345–7. 367–71; 1997b, 489–90; Tausend 2006, 150; Πιτερός 2008. For the reconstruction of the mudbrick superstructure at Elliniko: Kephalari (23), see Πίκουλας 1996, 46; Πιτερός 1997a, 350.

[831] For previous research on this tower, see Lord 1939, 80–1. 83; Young 1956, 144; Wiseman 1978, 116; Wright 1990, 610–652; Πέππα 1990, 211; Πίκουλας 1990, 257 (no. 6); Gauvin 1992, 136 figure 7.2. 137 figure 7.3. 13 figure 7.4; Bynum 1995, 86. 95–7; Πίκουλας 1995, 174–5; Jansen 2002, 96–7; Marchand 2002b, 63. 236–9; Penttinen 2005, 112. 115; Tausend 2006, 22. 41–2; Marchand 2009a, 156; Bonnier 2014, 22. 132. 150; Cloke 2016, 898–911; for its late 4th-century BC date, see chapter 4.

defenders.[832] However, it is puzzling that a design developed to withstand the latest siege-craft technology should only be found at three rural towers, but not at major fortified sites in the region.[833] X. Πιτερός therefore suggested an alternative explanation, namely that the towers were constructed on tapering bases for static reasons.[834] If we accept X. Πιτερός' reservations and alternative interpretation, tapering bases therefore no longer mark out towers as principally military structures.

c) Criterion 2: location

Moving on from the discussion of architectural features, a second criterion that contributes to the discussion of "military" versus "non-military" rural fortifications is that of the sites' location. This criterion has already been employed extensively in the previous sections. In chapter 6, topographical contexts were used to identify sites with a strategic-military function (although in many cases the evidence of the location alone remained inconclusive), while section 7.1 has shown a striking correlation between the distribution of rural fortifications and possible agricultural areas. This correlation calls for further investigation, focusing especially on the question of what types of agriculture could be expected in the Late Classical and Hellenistic Argolid.

As discussed in section 2.3, there is evidence for the cultivation of different arable and tree crops, as well as for pastoralist activities and the exploitation of marginal resources. Summarising briefly, olives are best attested (although this may partly be a result of their archaeological visibility), but other known crops include cereals, legumes, tree crops and (to a limited extent) grapes. Evidence for ancient olive cultivation occurs

[832] Πίκουλας 1995, 341–4; Πιτερός 1997a, 351; Tausend 1998, 46–7.
[833] Πιτερός 1997a, 351. So far tapering bases are only attested at major fortifications at Chaironea, Samikon, Limyra, Gagai and Pergamon (Marksteiner 1994).
[834] For example, the tower at Elliniko: Kephalari (23) is located on a hill, so that a wider base was needed to support the mudbrick superstructure (Πιτερός 1997a, 350–2).

primarily in areas that lie below 500 mamsl and have a slope up to 10 °.[835] This means that several fortifications in the western Argolid — the round towers at Nera (53), Prosilia (66) and Xylopyrgo (88), and the rectangular towers at Kephalovryso (40), Lileika Xeropigadou (47) and Tourniki: Gaidourovouni (79) — were probably not connected to olive cultivation (**figures 167–8**). Interestingly, in chapter 6 a possible strategic-military interpretation was tentatively put forward for precisely these five structures.

Although olive cultivation dominates both the archaeological and palaeo-environmental record, neither the finds from the *Berbati Limnes Archaeological Survey* nor from the southern Argolid suggest a Late Classical and Hellenistic "olive monoculture".[836] A particularly good example that illustrates the combination of different agricultural and pastoralist activities, or at least the consumption of different produce, is the tower at Prosymna: Pyrgouthi (69). Despite the small quantity of stratified material recovered at this site, there are remains of olives, almonds, figs and legumes (Late Hellenistic or Early Roman),[837] bones of sheep, goats, birds and occasionally pigs and cattle (Classical and Hellenistic),[838] and fragments of terracotta beehives (from a predominantly Late Hellenistic stratum).[839]

If we assume that these animal and plant remains are local "produce", they paint a picture of a mixed agricultural-pastoralist economy. The surviving remains of pre-Roman agricultural installations in the wider region fit well into such a general pattern. Many of them are located at the upper limits of olive cultivations, which may suggest that individual sites exploited both the agricultural areas at lower altitudes and grazing

[835] Unlike today, areas with an underlying limestone geology seem to have been avoided for olive cultivation in antiquity (section 2.3).
[836] Jameson et al. 1994, 275–6; Penttinen 2005, 114. In general, polycropping of different tree crops was probably more common in Greek antiquity than monocropping (Foxhall 2007, 112–6).
[837] Sarpaki 2005, 318. 336.
[838] Mylona 2005, 301–3.
[839] Penttinen 2005, 46.

or marginal lands in the mountains above. Numerous Late Classical and Hellenistic rural fortifications in the northern and western Argolid — for example the fortified settlements of Elliniko Astrous (21), Tsiorovos Dolianon (82), Andritsa: Goulas (9) and Achladokampos (1) or the tower at Krya Vrysi: Marmarakia (43) — share this location on "ecological boundaries" (**figure 167**).

Interestingly, one type of agriculture that is largely unattested in the Late Classical and Hellenistic Argolid is viticulture.[840] If this reflects an actual absence of vines rather than a lack of evidence, it indicates that S. Morris' and J. Papadopoulos' proposed connection between towers and slave labour may not provide an appropriate framework for understanding the rural fortifications in the ancient Argolid. The two scholars noted that many regions with a high density of ancient towers (for example Attica, Siphnos or Thasos) were heavily involved in economic activities based on unfree labour (especially mining, quarrying and viticulture), suggesting that towers may have been used to incarcerate the necessary labourers.[841] But if the Argolid not only lacks evidence for large scale quarrying and mineral extraction,[842] but also for viticulture, this explanation of rural towers does not seem applicable. The link between fortifications and agriculture must therefore be a different one, possibly involving alternative organisations of labour.

Looking beyond the direct connections between fortifications and agriculture, studying fortifications within their surrounding landscape occasionally also provides clues as to their place in the wider settlement pattern. A good example is again the tower at Prosymna: Pyrgouthi (69), which was originally located within or in close proximity

[840] See section 2.3.
[841] Morris and Papadopoulos 2005, 167–180.
[842] See section 2.3.

to a Late Classical and Hellenistic village, perhaps the *kome* of Prosymna.[843] This site acts as a reminder that even towers that appear "isolated" today may form part of larger settlements, which without detailed surface surveys remain invisible.

d) Criterion 3: agricultural installations

This brings us to the third type of evidence that may shed light on the functions of rural fortifications: remains of agricultural installations, especially presses[844] and olive mills (the latter usually referred to by the Latin terms *trapetum* and *mola olearia*).[845] In the Argolid, such structures are relatively common, with examples recorded at 19 rural fortifications as well as at Troizina (80) and Porto Cheli (64) (**figures 169–72**). Presses are found both at fortified settlements and at smaller sites,[846] whereas rotary olive mills are predominantly located near towers.[847]

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[843] Penttinen 1996a, 279; 2005, 113–4.

[844] On the difficulties of distinguishing places of wine and oil production, see Brun 2004, 7–27. Some presses may have been used in industrial activities (Foxhall 2007, 146–8).

[845] Based on Cato *Arg.* 20–22 and Columella *Rust.* 12.52.6–7, the term *trapetum* is usually associated with olive mills with concave crushing surfaces, while the term *mola olearia* is commonly used for mills with flat crushing surfaces (see for example Hadjisavvas 1992, 9–16; Brun 1997, 70–1). Although they may not reflect the ancient terminology (Frankel 1993, 477–80), *trapetum* and *mola olearia* are by now established archaeological terms and will therefore be used in the following to describe the olive mills in the Argolid.

[846] The examples at fortified settlements include a press bed at Andritsa: Goulas (9) (Ψυχογυιού 2000, 195), several Hellenistic press installations in the upper and lower town at Asini (14) (Frödin 1938, 33–8. 67; Jameson 2001, 287–9; Brun 2004, 105–7), ten rectangular weights from lever presses at Elliniko Astrous (21) (previously identified as "bases" (Goester 1993, 75–6)), a press bed at Ierakas (28), several presses at Mykinai (51) (Wace et al. 1923, 416; Bowkett 1995; Brun 2004, 103–5), at least 11 press installations at Porto Cheli (64) (see for example Ault 1999, 559–64; Jameson 2001, 282–7; Ault 2005, 79; 2007, 263), a possible weight block at Lygourio 2 (100) (Κριτζάς 1972b, 217) and a Late Classical or Hellenistic weight block at the possible fortification of Petrothalassa: Kypraiou (139) (now destroyed (Jameson et al. 1994, 484; Kardulias and Runnels 1995, 130–1)). Outside fortified settlements, a weight block was reported near the tower of Kampia (32) (Πιτερός 1995b, 113), a press bed at Lygourio 1 (49) (Lord 1939, 82; Πιτερός 2008, 296) and weight blocks at the possible tower of Katsigiari (115) (Jameson et al. 1994, 501; Kardulias and Runnels 1995, 130). Bowkett 1995 interpreted the presses at Mykinai (51) as dye works, but according to Brun 2004, 104 they were almost certainly agricultural installations.

[847] In all cases, only the lower stone of the mill is preserved. Olive mills were found at the towers of Amygdalitsa (7) (Πιτερός 1997d, 144), Iliopoulaiika (30) (Wright 1990, 610; Πίκουλας 1995, 237. 365; Gauvin 1997, 32; Cloke 2016, 911–2), Phichtia: Limiko (58) (Πίκουλας 1995, 177. 365; Jansen 2002, 79), Phichtia: Stathmos (60) (Lord 1939, 82; 1941, 95; Πίκουλας 1995, 183. 365), and Malantrenion (101) (Pritchett 1980, 19; Πίκουλας 1995, 193. 365) as well as at the

While many presses belong to the Late Classical or Hellenistic period,[848] the chronology of the olive mills is more problematic. Examples from Chios, Olynthos and Argilos as well as from Cyprus and the Levant demonstrate that rotary olive mills of both types (*trapetum* and *mola olearia*) were used from at least the Hellenistic period onwards,[849] but as long as a detailed typology of Greek olive mills is still lacking, a Late Classical or Hellenistic date can neither be proven nor excluded for the *trapeta* and *molae olearia*e at the towers in the Argolid.

What are the implications of these installations for reconstructing agricultural practices at and around the rural fortifications in the Argolid? Firstly, most installations — the *trapeta* and *molae olearia*e, as well as the presses at Asini (14), Porto Cheli (64), and Mykinai (51) — are connected to the production of olive oil rather than wine.[850] Their distribution thus confirms the cultivation of olives in the vicinity of the sites. With some caveats, the same also applies to the presses at Andritsa: Goulas (9), Elliniko Astrous (21), Ierakas (28), Kampia (32), Lygourio 1 (49), Lygourio 2 (100), Katsigiari (115) and Petrothalassa: Kypraiou (139). Although none of these can definitely be linked to oil production, they are more likely to have been used for olives than grapes — firstly

drystone circuit of Vourlia 1 (86) (Suto 1995, 11). At Pyrgouli (71), a large round conglomerate block was interpreted by Πιτερός 2005d, 268 as a Byzantine press bed, but the slight rise in the centre of the block suggests that it is in fact a very worn olive mill. Two further possible examples come from Myloi: Kalamaki (137) (Lord 1941, 108) and Elliniko: Kephalari (23) (Lord 1939, 82). Only at Petrothalassa: Kypraiou (139) an olive mill was recorded at a possible fortified settlement (Jameson et al. 1994, 484; Kardulias and Runnels 1995, 130–1).

[848] The weight blocks at Elliniko Astrous (21) and Troizina (80), which unlike the presses at Asini (14), Mykinai (51) and Porto Cheli (64) have not been discovered during excavations, belong to Brun's type 41, which is characteristic of the Hellenistic period (Brun 2004, 17). Press weights comparable to the find from Lygourio 2 (100) are known from Hellenistic Cyprus (Hadjisavvas 1992, 36–8).

[849] Brun 1997; Foxhall 2007, 165–177. For Chios, see Boardman 1958, 304; for Olynthos, see Foxhall 2007, 167–9; for Argilos, see Μπόνιας and Perreault 1997, 544–5; for Cyprus, see Hadjisavvas 1992; and for the Levant, see Waliszewski 2014.

[850] The identification of the installations at Asini (14), Mykinai (51) and Porto Cheli (64) as olive presses is based on the small size of the associated basins (Jameson 2001, 290; Brun 2004, 104–5).

because viticulture is hardly attested in the Late Classical and Hellenistic Argolid, and secondly because vines place higher demands on the location and soil properties.[851]

Secondly, both the mills and the presses at the rural fortifications follow the general pattern of agricultural installations in the region, with many sites located at the upper limits of possible olive cultivation areas. As noted above, this suggests that sites such Andritsa: Goulas (9), Elliniko Astrous (21) or Iliopoulaiika (30) were involved in a mixed agricultural-pastoralist economy.

Thirdly, olive mills and presses are usually not found together at the same site, the only exception being the remains at Petrothalassa: Kypraiou (139).[852] Although the sample of installations included in this study is too small to draw any definite conclusions, this may suggest that in the Late Classical and Hellenistic period the individual stages of olive oil production took place in different locations.

Looking at the overall distribution of olive processing sites, their comparatively high number poses the question of the scale of olive oil production in the Late Classical and Hellenistic Argolid, particularly in places such as Porto Cheli (64), Asini (14) or Elliniko Astrous (21), where several roughly contemporary production sites are recorded within the same fortification.

The role of olive cultivation within the wider economy is particularly well studied at Porto Cheli (64),[853] where presses are quite small but numerous, with approximately

[851] Hanson 1992, 163; Foxhall 2007, 112. See also section 2.3.
[852] For the now destroyed site of Petrothalassa: Kypraiou (139), see Jameson et al. 1994, 484; Kardulias and Runnels 1995, 130–1.
[853] Jameson et al. 1994, 384–94 suggested that the prosperity of 4th-century BC Halieis was strongly linked to supplying olive oil to the export market, while Ault 1999, 566 argued that the economic role of olive oil production should not be overestimated. For a critique of the strong link between olive production and export proposed in the *Southern Argolid Survey*, see also Acheson 1997.

one press for every four households. This demonstrates that olive oil production was not limited to large estates, but widespread within the city's community.[854]

But how much "surplus" did these olive presses produce beyond the amount required for local consumption? Based on comparisons to better-studied (and more effective) Roman olive presses and agricultural practices in the 18th and 19th century, L. Foxhall tentatively suggested that one press would at the most be sufficient to process the olives harvested from around 400–600 trees.[855] Assuming that there was one major olive harvest every two years and that every tree would produce an average of ca. 2.16 kg of oil per harvest,[856] the output of each press would at the most amount to ca. 864–1296 kg per harvest or ca. 432–648 kg per year. L. Foxhall also argued that a single wealthy household in the Classical period consumed between 200 and 300 kg of oil per year, which would be equivalent to the olive harvest from ca. 185–306 trees.[857] If these figures are approximately correct, each press could theoretically produce a yearly surplus of up to 132–448 kg.

These figures are admittedly rather speculative, but give cause to reconsider the role of olive cultivation in the economy of Porto Cheli (64), as well as Asini (14), Mykinai (51) and Elliniko Astrous (21). Although for individual households olive oil could be a considerable source of income,[858] the overall quantity of surplus produced per press is comparatively small. Considering that there must have been groups within the population that were not directly involved in agricultural production (e.g. craftsmen or

[854] Jameson 2001, 289. 291. The same may apply to Elliniko Astrous (21), where a large number of press weights were discovered dispersed throughout the settlement.
[855] Foxhall 2007, 215
[856] Foxhall 2007, 216. This figure was calculated using an average fruit to oil ratio of 4:1 (Foxhall 2007, 215).
[857] Foxhall 2007, 85–95. 216.
[858] 4th-century BC documents attest much fluctuation in the price of olive oil, varying between 12 drachmai and 55 drachmai per 39.4 litres (Pritchett and Pippin 1956, 184; Ault 2007, 264). Using these figures, the estimated surplus produced at one olive press could potentially be worth 40–625 drachmai.

mercenaries), this suggests that production was directed more towards local consumption than large scale export. This is another feature that distinguishes the Argolid from other regions with a strong link between rural fortifications and agricultural production. Whereas on Thasos or Leukas (to pick only two examples), wine was produced on a large scale for the export market,[859] the olive cultivation in the Argolid seems to have been aimed primarily at supplying produce for local consumption. Since this difference may have social implications, we should not necessarily expect to find in the Argolid the same strong emphasis on unfree labour that has been postulated for Thasos and Leukas.[860]

e) Criterion 4: finds

This issue will be explored in more detail in the final part of this chapter, but first we should briefly consider small finds, a final criterion for distinguishing "non-military" from military-strategic sites. The small finds from rural fortifications in the Argolid can be divided into two groups. On the one hand, there are finds that are connected to specific agricultural or industrial activities, such as beehives,[861] loomweights or terracotta spools,[862] metalworking debris[863] and moulds or kiln fittings.[864] Looking at the

[859] Morris 2001, 341–2; Morris and Papadopoulos 2005, 179; Tzochev 2016, 230–51.
[860] On the link between vineyards and slave labour, see Morris and Papadopoulos 2005, 175–80.
[861] Fragments of beehives were found at Prosymna: Pyrgouthi (69) (Penttinen 2005, 46) and Tsiorovos Dolianon (82) (Pritchett 1982, 76).
[862] Loomweights or terracotta spools relating to textile production were found at the following fortified sites in the region: Asini (14) (Poulsen 1994, 20), Elliniko Astrous (21) (Φάκλαρης 1990, 87; Goester 1993, 100), Kleonai (41) (Bonnier 2014, 143), Lygourio 1 (49) (Scranton 1938, 525), Lyrkeia (50) (Gallimore et al. 2017, 429), Mykinai (51) (Bowkett 1995, 36–40), Palaia Epidavros 1 (54) (Προσκυνητοπούλου 2011, 168. 227–8), Paralio Astros (56) (Brommer 1975, 179), Phourkaria (61) (Brommer 1975, 178), Prosymna: Agios Athanasios (67) (Penttinen 1996a, 251), Prosymna: Pyrgouthi (69) (Penttinen 1996a, 262; 2005, 53. 71), Tsiorovos Dolianon (82) (Pritchett 1982, 76) and Tyros (83) (Φάκλαρης 1990, 144).
[863] One fragment of iron ore and several pieces of metal slag were recorded at Elliniko Astrous (21) (Goester 1993, 100) and one piece of iron ore at Tsiorovos Dolianon (82) (Goester 1993, 98). A piece of metal slag was observed in September 2017 near the tower of Spathokommeno (73), but its date and relation to the tower are unclear.
[864] Moulds or kiln fittings were recorded at Asini (14) (Frödin 1938, 336) and Mykinai (51) (4th–3rd- century BC moulds from the site are now on display in the site museum). In addition, a kiln was excavated ca. 30 m from the tower at Marmaralono Agiou Petrou (102) (Rhomaios 1908, 178–84)

distribution of these finds, objects relating to metalworking and pottery production are concentrated in fortified settlements, while beehives, loomweights and terracotta spools are found both at fortified settlements and towers (**figure 173**). Loomweights from Lygourio 1 (49) and Prosymna: Pyrgouthi (69) suggest that at least at some point during their occupational history, these towers served as more than merely military-strategic sites.

On the other hand, there are also finds that are not specifically associated with any agricultural or industrial activities, but can nevertheless offer clues to a site's function. For example, the distribution of "functional categories" in pottery assemblages can be used to compare and contrast individual sites and may help to distinguish "agricultural" from "military" fortifications or "residential" from "non-residential" sites.[865]

Unfortunately, the pottery assemblages published at most fortified sites in the Argolid are insufficient to allow a meaningful comparison between individual fortifications. Three rare exceptions are the drystone circuit at Vigliza (85), the tower at Agios Sostis (5) (probably a military-strategic site)[866] and the tower at Prosymna: Pyrgouthi (69).[867] As already discussed in the previous chapter, the pottery assemblage from Vigliza (85) shows a pattern consistent with a temporary occupation, perhaps in the context of pastoralism. The assemblages at Agios Sostis (5) and Prosymna: Pyrgouthi (69) are very different. Both sites show a high proportion of drinking, dining, and cooking vessels, suggesting frequent (if not permanent) residence, but while the tower at Agios Sostis (5) appears to have been used continuously or at least sporadically from the Late

[865] For the study of "functional categories" in pottery assemblages, see section 5.2.
[866] For the interpretation of Agios Sostis (5) as a military-strategic site, see chapter 6.
[867] The figures for Agios Sostis (5) are based on Cloke 2016, 901, excluding pottery that could not be assigned to a specific function; the figures for the Prosymna: Pyrgouthi (69) on Penttinen 2005, 23–89, excluding earlier and later pottery, as well as pottery of uncertain date.

Classical into the Hellenistic period, the pottery at Prosymna: Pyrgouthi (69) belongs to two distinct phases in the Early Hellenistic and the Late Hellenistic or Early Roman period. While the first phase coincides with the construction of the tower, the second phase represents a period of later reuse.[868]

Agios Sostis (5) and Prosymna: Pyrgouthi (69) also differ in the proportion of different functional categories within the pottery assemblages (**figure 174**). At both Early and Late Hellenistic Prosymna: Pyrgouthi (69), drinking and dining vessels are more prominent than at Agios Sostis (5), while for the Late Hellenistic period Prosymna: Pyrgouthi (69) also preserves a higher proportion of cooking vessels. The Early Hellenistic pottery from Prosymna: Pyrgouthi (69) is difficult to interpret,[869] but the Late Hellenistic assemblage finds its closest regional parallels at two unfortified rural sites investigated in the *NVAP* (**figure 175**). This indicates that during its phase of Late Hellenistic reuse, the tower at Prosymna: Pyrgouthi (69) may have fulfilled the same (possibly agricultural) function as other unfortified sites in the region.[870]

f) "Agricultural" fortifications: economy and agency

Combining the four different criteria discussed in this chapter, the following picture emerges. The majority of fortified settlements in the Argolid are not only located with access to possible agricultural areas and (in many cases) upland zones suitable for pastoralism, but also show evidence of agricultural and industrial activities in the form of small finds and agricultural installations.[871]

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[868] Penttinen 2005, 92–5; Cloke 2016, 164. 901.

[869] Penttinen 2005, 93 noted that with regard to the question of military versus non-military use, the early finds from the tower are inconclusive. Perhaps the differences to the assemblage from Agios Sostis (5) speak for a non-military interpretation of Early Hellenistic Prosymna: Pyrgouthi (69).

[870] For these pottery assemblages and their interpretation, see Cloke 2016, 682–7. 799–818.

[871] Some fortified settlements had access to agricultural areas, but have produced no finds related to agricultural or industrial activities (Achladokampos (1), Ermioni (24), Iliokastro (29), Kantia

Given that remains of agricultural and industrial activities were used in chapter 3 to distinguish between forts and fortified settlements, this pattern is hardly surprising. What is more interesting is the diversity of the fortified settlements connected to agriculture. They include nucleated sites of all sizes and at different levels of the settlement hierarchy, from the small fortified settlement of Prosymna: Agios Athanasios (67),[872] over *komai* and dependent settlements to urban centres.

Moving on to minor fortifications, the pottery assemblage from Prosymna: Pyrgouthi (69) demonstrates that towers could be frequently or permanently occupied and fulfil functions that are not strictly military-strategic. In fact, many towers are not only located in areas suitable for ancient agriculture, but also show concrete evidence for non-military activities (such as agricultural processing or textile production).[873] In addition, the architecture suggests that everyday accessibility often took precedence over increased security.

Together the four criteria (architecture, location, agricultural installations and small finds) thus suggest that many towers in the Argolid served as non-military sites at some point during their Late Classical or Hellenistic occupation history. This offers a plausible interpretation for many fortified structures that were so far unexplained, especially in the areas that are not within easy reach of possible refuge sites.

The four criteria therefore underline the connection between fortification and agriculture and strongly suggest that many sites not only served as temporary refuges, but also as permanent places of agricultural processing. This agricultural connection reinforces the local importance of rural fortifications at all levels of the settlement

1 (33), Kyparissi (44), Nafplio (52), Poulithra (65), Plaka Leonidiou (63), Sporitza (74) and Tiryntha (76)). In many cases, this may partly be a consequence of a lack of research.

[872] Penttinen 1996a, 251. 277.

[873] This includes the towers of Amygdalitsa (7), Elliniko: Kephalari (23), Iliopoulaiika (30), Kampia (32), Lygourio 1 (49), Phichtia: Limiko (58), Phichtia: Stathmos (60), Pyrgouli (71), Malantrenion (101) and Myloi: Kalamaki (137), as well as the possible tower at Katsigiari (115).

hierarchy. However, acknowledging this local role forces us to consider one crucial question that has so far remained unanswered. Who was responsible for constructing the ancient fortifications in the Argolid, especially those without a strong military-strategic importance?

A first relevant factor is the construction cost of fortified sites in antiquity. Although there are no reliable sources for the cost of fortifications in the Argolid,[874] it is clear that the construction of major fortifications such as fortified settlements and forts required significant financial resources. For example, a 4th- or 3rd-century BC building inscription from Kyzikos places the cost for a single tower in the city's fortification at 9200 drachmai,[875] while around 200 BC the construction of ca. 20–25 m of curtain wall at Teos may have required a financial outlay of up to 5010 drachmai.[876] In the late 4th century BC, the city of Kolophon collected loans totalling 333000–454000 drachmai for the construction of its walls,[877] while in the late 4th or early 3rd century BC Argos received a loan of 100 talents (600000 drachmai) from Rhodes for the improvement of its fortifications and cavalry.[878] Although it is unclear how much of the loan was in fact spent on Argos' fortifications, these inscriptions demonstrate that in the Late Classical and Hellenistic period the cost of building or strengthening major fortifications was considerable and clearly exceeded the financial capacity of the average wealthy individual. Forts and fortifications walls around major settlements were therefore most likely financed by larger political bodies.

[874] As noted in section 4.2, only two surviving building inscriptions refer to the construction of fortifications in the Argolid. Neither of them records the precise cost of a specific structure. Building inscriptions from the sanctuary of Asklepios at Epidauros furthermore show that construction costs could fluctuate considerably over time, even within the same construction project (Burford 1965, 27–8).
[875] Maier 1959, 209–11; 1961, 66.
[876] Maier 1959, 217–19. 221–3; 1961, 66–7.
[877] Maier 1959, 224–31; 1961, 67.
[878] *SEG* xix 317 = *SEG* xxv 361 = *SEG* xxx 358 = *SEG* xli 278 (ca. 300 BC).

For drystone circuits and individual towers, the picture is more nuanced. A skilled mason could probably construct 1 m^3 of drystone masonry per day, meaning that an approximately 3.6–4.5 m wide and 2 m high circuit (measuring ca. 43 by 68 m) could be completed by 80 men in 24 days or by 10 men in 192 days.[879] Assuming that stones were readily available and that each mason was paid 2.5 drachmai per day,[880] a drystone circuit would cost around 4800 drachmai, possibly less if unfree labour was available.

The cost of "isolated" towers is more difficult to reconstruct. Based on a late 4th-century BC building inscription from Eleusis,[881] L. Haselberger estimated that the construction of the tower at Cheimarrou on Naxos would have required ca. 8000 drachmai,[882] a sum comparable to the cost of the tower at Kyzikos mentioned just above. However, while the structure at Cheimarrou is constructed entirely in isodomic masonry, the towers in the Argolid usually consisted of a mudbrick superstructure on a stone base. Assuming that the ratio between the towers' width and height was approximated 1:2,[883] and that the stone bases did not rise significantly above the level preserved today, a tower like Pyrgouli (71) would require ca. 509 m^3 of mudbrick,[884] or (with an average mudbrick size of 0.45 by 0.45 by 0.1 m) ca. 24941 individual bricks.[885] Prices for ancient mudbricks varied, but the above-mentioned inscription from Eleusis records a cost of ca. 38 drachmai per 1000 bricks (including transport), plus an additional 12–20 drachmai for construction.[886] If the cost of building material and labour was comparable in the Argolid,

[879] Fachard 2016a, 221.
[880] Fachard 2012, 256. This figure is based on the daily salary of masons employed at Eleusis in 329/8 BC (*IG* II^2 1672).
[881] *IG* II^2 1672 (329/8 BC).
[882] Haselberger 1984, 47–8.
[883] See section 6.1.
[884] The tower at Pyrgouli (71) measures ca. 8.4 by 9.4 m. The walls of the stone socle are ca. 1 m wide and are preserved up to a height of 2.4 m.
[885] On the average size of Greek mudbricks, see Maier 1961, 71–2.
[886] Pritchett and Pippin 1956, 286–7; Maier 1961, 66–7.

this would place the price of the mudbrick at Pyrgouli (71) around 1347 drachmai.[887] Together with the price of the stone base, perhaps around 1300 drachmai,[888] this would bring the total cost up to ca. 2650 drachmai. This figure is admittedly very speculative (and does not include the cost for rooftiles or the wooden parts of the construction), but nevertheless suggests that the towers in the Argolid were considerably cheaper than their stone counterparts on the islands.

We know very little about the level of personal wealth in the Late Classical and Hellenistic Argolid, but to put the estimated costs of towers and drystone circuits into perspective, we can compare them to contemporary property prices on Tenos, in Attica, or at Olynthos. In the 4th and 3rd century BC, an urban house on Tenos could be purchased for around 1100 drachmai), in Attica for 2000–5000 drachmai, and at Olynthos for 230–5300 drachmai.[889] This suggests that although drystone circuits are very much at the upper limit of what would be financially feasible for an individual or individual family, the estimated construction cost of stone and mudbrick towers falls remarkable close to mid-range urban property prices in Attica and Olynthus. "Isolated" towers and perhaps even drystone circuits could thus have been constructed by individuals rather than larger political bodies.

This brings us to the final question of this chapter. Who were the political bodies and individuals behind the construction of locally-focused fortifications in the Argolid? For major fortifications such as fortified settlements and forts, the most obvious candidates are the five Late Classical and Hellenistic city-states in the region. Judging by the building inscriptions collected by F. Maier, most Greek fortifications were public

[887] This figure is calculated with an average cost of ca. 16 drachmai for setting 1000 bricks.
[888] The tower at Cheimarrou, for which Haselberger 1984, 47–8 estimated a total cost of 8000 drachmai, is ca. 15 m high and 9.2 m wide (Morris and Papadopoulos 2005, 155), while the stone base at Pyrgouli (71) is today preserved up to a height of 2.4 m.
[889] Cahill 2000, 508–9; Nevett 2000, 335–6.

monuments,[890] and both the surviving inscriptions from Argos (12) and from Troizina (80) attest the *demos*' crucial role in the respective building projects.

However, at least for major fortifications in the territory of Argos there are two additional possibilities. Firstly, fortifications at dependent settlements may have been constructed before their integration into the Argive territory. This seems to have been the case at Kleonai (41),[891] and possibly at Plaka Leonidiou (63).[892]

But even major rural fortifications that were constructed "under Argive rule" may not necessarily have been centrally planned or financed. Especially from the 4th century BC onwards, *komai* feature prominently in Argive inscriptions, especially through the practice of including a citizen's *kome* or *pentekostys* as part of his official nomenclature.[893] We know comparatively little about the practical role of the *komai* within the city-state of Argos, but at least in the 3rd century BC the community of Asine was referred to as a *koinon* (κοινὸν τῶν Ἀσιναίων), while by the 2nd century BC Mycenae had its own assembly (the *aliaia teleiai*) and magistrates (*damiorgoi*), replicating the larger political institutions within Argos itself.[894] We thus begin to see the Argive *komai* (or at least some of them) as semi-independent political communities under Argive control, so that the initiative and financial means for fortifying rural settlements may not only have come directly from the central assembly in Argos, but from the individual local communities themselves.[895]

[890] Maier 1961, 40.
[891] For the date of the walls at Kleonai (41), see chapter 4.
[892] For the date of the walls at Plaka Leonidiou (63), see chapter 4; for the identification of the site as ancient Prasiai and the incorporation of the Kynouria into the Argive territory, see section 5.1.
[893] For naming practices in Argive inscriptions, see for example Piérart 1985, 348–54; 1997, 338–9; 2004, 604; Kritzas 2006, 425.
[894] *IG* IV^2. i 621 (229–5 BC) and *IG* IV 497 (197–6 BC). Piérart 1997, 339–40.
[895] There may even be parallels for the role of local communities in Troizen, where the Skyllaieis contributed their common funds (τὰ κοινεῖα τὰ ὑπάρχοντα) for the construction of the *diateichisma* (*IG* IV 757 (146 BC)). Frost 1980, 187–8 locates this community near Phourkaria

So far, the link between the Argive *komai* and local construction works is rather tenuous, but a stamped tile from Elliniko Astrous (21) (ancient Eua) may provide an important clue. This tile, discovered in 1960 near the ancient city,[896] bears a rectangular stamp with the inscription ΕΥΑΤΑΝ ΔΑΜΟΣΙΟΙ (**figure 176**). According to K. Καλίτσης, it belongs to the Hellenistic period.[897] If this date is correct, the inscription is very significant. We know thanks to the bronze archive from Argos that Eua was an Argive *kome* from at least the early 4th century BC onwards,[898] and the settlement probably remained under Argos' control until the end of the Hellenistic period.[899] This means that the tile stamp from Elliniko Astrous (21) not only testifies that the *kome* of Eua could refer to itself as a *damos* while under Argive control, but also that it was involved in public building works. Although the tile probably does not come from the walls of Elliniko Astrous (21), the inscription thus strengthens the case for an involvement of the Argive *komai* in the construction of major rural fortifications.

In contrast, "agricultural" towers in the Argolid and possibly even some of the drystone circuits (especially Vigliza (85) with its possible links to a pastoralist economy) may belong to a rather different scenario. As the calculations in this chapter have shown, these sites may well have been financed and constructed by wealthy individuals rather than by larger political bodies. This raises the question of the economic and social context of towers in the Late Classical and Hellenistic Argolid.

(61), which is the only known fortified rural settlement that can be attributed securely to the Hellenistic territory of Troizen.

[896] The exact findspot is not specified in the original publication (Καλίτσης 1960), but Φάκλαρης 1990, 190–1 suggested that the tile might belong to the extra-urban sanctuary of Apollo.

[897] Καλίτσης 1960, 6.

[898] Kritzas 2006, 429. See also section 5.1.

[899] Shipley 2000, 377. Eua was previously identified as a member of the Achaian League, but this argument was based on Achaian federal coins that are no longer attributed to Eua (Warren 2007, 97–8).

This question is very difficult to answer, particularly because social and economic structures may have varied considerably between different environments, city-states and time-periods. However, at least for the territory of Hellenistic Argos (where most of the "non-military" towers are located) we can assume a high degree of social variability, together with an uneven distribution of private wealth.[900] Given the agricultural focus of Argos' economy, cultivation and pastoralism probably provided one of the main sources of individual income.[901] Private wealth was therefore strongly linked to land ownership or the exploitation of agricultural and pastoralist resources.

Comparing the estimated construction costs not only to property prices, but also to the income that could be generated from a single olive press can help to contextualise ancient towers within this socio-economic environment. As argued above, the average output of a Late Classical or Hellenistic olive press would at most amount to 432–648 kg of oil per year, of which ca. 200 and 300 kg were required for household consumption, leaving a yearly surplus of up to 132–448 kg. Using a figure of 12–55 drachmai per *metretes* (39.4 litres),[902] this olive oil surplus could generate a yearly income between 40 and 625 drachmai, compared to the 2650 drachmai necessary to construct a rural tower. Of course, olive oil was not the only possible source of income,[903] but nevertheless this comparison suggests that we should associated rural towers with the wealthier citizens of Argos rather than the "rural poor".

At the same time, we should remember that the individuals that financed rural towers were not necessarily the residents, the cultivators of the surrounding land or even

[900] This assumption is based on research such as N. Dimakis' study of mortuary practices in Classical and Hellenistic Argos (Dimakis 2011, 119; 2016, 22–5. 75–7).
[901] For the "agricultural economy" of ancient Argos, see Piérart 1997, 332.
[902] Pritchett and Pippin 1956, 184; Ault 2007, 264.
[903] For example, a mid 4th-century BC altar dedicated at Epidauros as a "tithe of goats" attests the role of pastoralism as a possible source of income (*SEG* xxvi 451 (ca. 350 BC) (Μίτσος 1976; Jameson et al. 1994, 60)).

the landowners. Leases and sale agreements from other regions suggest that rural properties in Late Classical and Hellenistic Greece frequently changed hands and were often leased to tenants.[904] In addition, a Late Hellenistic inscription from Argos attests the existence of "public and sacred land" (ἱερὰ καὶ δαμοσία χώρα), that was leased out to private individuals for cultivation.[905] Thinking of the rural towers as "feudal seats" of wealthy Argive families is therefore likely to be misleading.

Equally, however, the towers in the Argolid cannot be explained as parts of large agricultural estates within a profit-orientated slave economy. The reasons for this have been outlined above: the region lacks evidence for labour-intensive viticulture or export-orientated olive monoculture, and there are no clues in the architecture of the towers that would suggest a link to unfree labour.

Instead, the "agricultural" towers of the Argolid are probably located somewhere between the two poles of "feudal seats" and slave-based estates. Perhaps they can best be explained as privately financed structures built by wealthy landowners in lieu of ordinary unfortified farmsteads. They were not necessarily orientated towards the cultivation of a particular crop, and were involved in different types of agriculture, along with pastoralism in upland areas. In this context, a tower would not only provide security for its residents (whether members of the owner's household or temporary tenants), but would also enhance the value of the surrounding land by providing an alternative to the disruptive practice of taking refuge in nearby major fortifications or in the mountainous hinterland.

Examining the Argolid's rural fortifications within their topographical context thus confirms the strong connection between fortifications, agriculture and pastoralism,

[904] See for example Osborne 1985b; Morris and Papadopoulos 2005, 165–6.
[905] Kritzas 1992, 231–40; Piérart 1997, 332–3; Kritzas 2006, 410–11; Rousset 2013, 125.

not only as places of refuge, but also as sites of agricultural production and processing. This offers a plausible explanation for many sites without a clear military-strategic function. At the same time, this chapter emphasises the local importance of both major and minor fortified sites and thus paints a new picture of the Argolid, where city-states are less centralised than was previously assumed and where both individuals and local communities have a greater degree of agency in the use and construction of Late Classical and Hellenistic fortifications.

CHAPTER 8: CONCLUSIONS

Approaching the Argolid from the north, three fortifications dominate the landscape: Mykinai on the northern edge of the plain, Nafplio on the coast and the Larissa towering over the modern city of Argos. But prominent as they may be, these major sites are by no means isolated structures in an otherwise unknown archaeological landscape. Instead, they are surrounded by numerous smaller, and often less visible fortifications — fortified second-order settlements, forts, towers or simple drystone circuits — and it is these minor sites that have become the main focus of this first systematic study of fortifications in the Argolid.

Analysing these sites required a substantial amount of preliminary "groundwork", trawling through publications from 19th-century travellers' accounts to reports in the latest issues of the Αρχαιολογικόν Δελτίον, locating the fortifications with the help of satellite images and aerial photographs, visiting (or at least attempting to visit) all 146 sites and recording their position with a handheld GPS, investigating the surrounding ancient landscape (chapter 2), settling on a coherent typology and terminology (chapter 3) and creating the first systematic framework for dating the individual structures (chapter 4).

But at the heart of this study is the analysis of the collected sites, which sheds new light on the role of the region's rural fortifications by placing them in the context of their natural, political and socio-economic environment (chapters 5–7). Even though there are some instances of Late Classical or Hellenistic military-strategic rural fortifications in the Argolid (such as the intervisible sites along Epidauros' southern border, the occasional towers at defiles or passes, and the fortifications near the harbours of the Saronic Gulf), this study has shown that fortifications built for local "civilian" communities predominate in most parts of the region.

These conclusions not only allow a better understanding of the individual sites in the Argolid, but also have important wider implications within ancient military studies and beyond. Firstly, the results of the current study contribute to the long-standing and ongoing debate about the fundamental functions of rural fortifications in Greek antiquity. As noted in chapters 1 and 6, fortified sites throughout the Greek world have long been interpreted primarily as military-strategic defensive networks,[906] a trend that continues to influence current scholarship, including recent studies in the Korinthia,[907] Sikyonia[908] and Achaia Phthiotis.[909] In contrast, the present thesis — heavily indebted to S. Fachard's research in the territory of Eretria and on the Mazi plain — belongs to a small, but growing number of studies which propose that the model of rural fortifications as "territorial defences" may often be oversimplified.[910] It thus calls for a re-examination of sites or regions that have so far been viewed exclusively within a military-strategic framework, as well as of sites that have previously been identified as fortified farmsteads solely on the basis of architectural features, agricultural installations or find assemblages (for example J.H. Young's "country estates" at Sounion)[911].

Secondly, placing the Argolid's rural fortifications in the context of their surrounding landscape helps to evaluate their place within Classical and Hellenistic warfare on the northeastern Peloponnese. The scale and location of the individual sites demonstrates that most of the region's rural fortifications were not primarily designed to play a role in the large-scale military campaigns known from literary sources, but largely

[906] See for example Maele 1982, 199–205; Fossey 1986, 135–41; Osborne 1987, 155; Fossey 1992, 128–30; Gauvin 1992, 145; Maele 1992, 106; Skorda 1992; Πίκουλας 1995; McInerney 1999, 343–6; Topouzi et al. 2002, 559–566.
[907] Caraher et al. 2010.
[908] Lolos and Koskinas 2011, 216–268.
[909] Chykerda 2010, 100–24; Chykerda et al. 2014a, 20–2; 2014b, 287–301.
[910] See for example Fachard 2012 (Eretria), Seifried and Parkinson 2014 (Karystos), Fachard et al. 2015; Fachard 2016a, 226–7; 2017b (Attica) and Nakas 2016 (Molossia). For a summary of recent projects on Greek rural fortifications, see Fachard 2016b, 82–3.
[911] Young 1956, 122–43.

belong to a context of small-scale conflict and raiding. The sites thus offer a window into a type of warfare that significantly shaped life in the Greek countryside — especially in vulnerable border regions — but largely eludes us in written sources.

In emphasizing the importance of "small scale" warfare, the results of the present study stand in stark contrast to the dominant narrative of Classical warfare, which focuses overwhelmingly on pitched hoplite battles.[912] However, this narrative has been increasing called into question in recent decades, especially for the Late Classical and Hellenistic periods. For example, alternative types of troops (such as peltasts, archers or slingers)[913] or military tactics[914] seem to have played a more important role in Greek warfare than they have previously been given credit for. Studies like the present thesis fit well into this context of challenging the traditional focus of Classical studies on pitched battles and — based primarily on archaeological material and therefore less affected by any biases in ancient written sources — may indeed prove particularly valuable for studying Greek warfare away from the battlefield.

Thirdly, it has become increasingly apparent over the past few chapters that ancient rural fortifications were multifunctional, both in terms of individual sites and site types. With the possible exceptions of circular towers and rectangular towers with chamfered corners, no type of rural fortification is clearly tied to a specific function. For example, possible watchtowers such as Akova: Varda (6) and fortified farmsteads like Prosymna: Pyrgouthi (69) are architecturally nearly impossible to distinguish. Even at

[912] A detailed discussion of the role of pitched hoplite battles (advocated as central to Greek warfare in studies such as Hanson 1989; 1998) lies beyond the scope of this study, but its history of scholarship has briefly been summarised by Kagan and Viggiano 2013 in their discussion of the "hoplite orthodoxy".

[913] See, for example, Wees 2004, 61–76; Hunt 2007, 118–24; Sekunda and De Souza 2007, 326–348. For peltasts, see also Niese 2012, for archers, see Davis 2013 and for slingers, see Pritchett 1991b, 1–67; Sheldon 2012, 159–60. On professional specialization in Hellenistic warfare, see for example Chaniotis 2005, 78–9.

[914] See, for example, Krentz 2000, 167–78; Sheldon 2012, 54–140 for the role of deception and surprise attacks in Classical and Hellenistic warfare.

individual sites, "strategic-military" and "non-military" roles are not mutually exclusive, as illustrated by Kazarma (39), a site which probably served primarily as a border fort, but which, owing to its water supply, could double as a temporary place of refuge in times of conflict.

This multifunctionality not only explains why the function of individual sites is so difficult to establish, but also highlights the limitations of studies that focus primarily or exclusively on the architectural features and developments of Greek fortifications.[915] Such studies are invaluable for dating individual sites and understanding the technology of Greek siege-craft, but the multifunctionality of fortified structures means that the role of individual sites is difficult to appreciate solely on the basis of their architecture. Instead, ancient rural fortifications call for more multifaceted and methodologically diverse approaches that take into account the varied and highly significant natural, political and socio-economic setting of the individual structures.[916]

In the present study, rural fortifications were not only considered from a strictly military-strategic perspective but also as fortified places of habitation, production and agricultural processing, revealing a remarkable degree of local motivation and agency.[917] This phenomenon is particularly striking in the territory of Argos, where *komai* such as Asine, Mycenae and Eua begin to appear in the archaeological and epigraphic record as semi-independent political communities. This demonstrates how rural fortifications can contribute to reconstructing the socio-political structures within specific areas or political territories — an approach which has not yet been fully explored, but which has significant

[915] For example Winter 1971; Garlan 1974; Lawrence 1979; Adam 1982.
[916] For the importance of studying fortifications from multiple angles, see for example Fachard 2016b, 84–5.
[917] In this aspect, the current work stands in contrast to G. Shipley's recent study of the early Hellenistic Peloponnese. While the current work emphasises local agency, G. Shipley concludes that "few explicit choices affecting the landscape or economy were made either at regional level or at that of locality" and continues to see the city-state as the key level at which decisions were taken (Shipley 2018, 288).

potential, especially for regions where literary and epigraphic information on political and social structures is comparatively scarce.

In the Argolid, this high degree of local agency may in part account for the very diverse distribution patterns of rural fortifications. Some trends already were apparent in summarising the distribution of different types of fortified structures in chapter 3. For example, there is a marked east-west divide between the western Argolid (where towers are the most common type of fortified structure), and the Akte and eastern Argive territory (where forts and drystone circuits predominate). Other variations in distribution pattern concern the use of rural fortified sites. Overall, a higher proportion of sites in the eastern Argolid seem to have fulfilled "strategic-military" functions (e.g. the fortifications along the southern border of the Epidauria, the fort of Ano Phanari (10) or the coastal towers near Troizen's harbour at Pogon) than in the western part of the region, while the Kynouria and Thyreatis show an unusually strong focus on the fortification of coastal settlements.

Comparing the results of this study to the role of rural fortifications in other parts of the Greek mainland and the islands, this diverse pattern is no exception. For example, the western Argolid not only differs considerably from the Kynouria, Thyreatis and Akte, but also from Lakonia and Messenia (where fortifications are mostly absent),[918] Akarnania (where fortified refuges are deliberately hidden from view),[919] or the

[918] Πίκουλας 1990, 248. 255; 2000, 266; Morris and Papadopoulos 2005, 201.
[919] Ley 2009.

islands.[920] Contrary to common assumptions that underlie many earlier studies,[921] Greek rural fortifications thus show very strong regional or even local developments.

This diversity of rural fortifications not only highlights the need for further studies of defensive sites in specific regions or micro-regions, but also demonstrates how a comparatively small repertoire of architectural types could be adapted to suit a wide variety of topographical, economic and social settings. This adaptability makes fortified structures a particularly good case study for future research on the interaction between natural environment and human activity in ancient Greece.

The present study thus demonstrates the potential of a "landscape approach" for future fortification studies, as well as presenting the first systematic collection and analysis of rural fortifications in the Argolid. Nevertheless, some issues still remain, especially concerning questions of chronology, which despite the new framework established in chapter 4 remains the study's "Achilles' heel".

Firstly, it is often impossible to establish whether specific sites were in use at the same time — an issue that is particularly problematic for the study of rural fortifications as defensive "networks". For example, the sites on the southern border of the Epidauria seem to form a line of intervisible fortifications, but until we can prove that Iria (31), Xydeika (106), Gyphtokastro (27), Skala 1 (104), Stavropodio (75) and Benteni Kiapha (16) were occupied simultaneously, this remains nothing more than a working hypothesis.

[920] With a density of up to one tower per 1.3 km^2 (Πίκουλας 2000, 268–275), surviving towers on some islands (especially Siphnos, Keos and Thasos) are considerably more common than in the Argolid, although this may partly be due to the islands' preference for masonry rather than mudbrick constructions. Many towers on the islands may be connected to mining areas (e.g. on Andros (Τελεβάντου 1996, 49–53) or Siphnos (Ashton 1991; Birkett-Smith 2000)) or agricultural production (e.g. on Siphnos (Δραγάτσης 1915; 1920)).

[921] For example Gauvin 1992, who without much discussion adopted Ober's Attic model of fortifications as defensive networks for the study of rural fortifications in the territories of Phleious and Kleonai.

Secondly, the region's fortifications can only rarely be dated accurately enough to connect them to specific historical events known from literary sources. Cases like the fortifications at Argos (12), Palaia Epidavros 1 (54) and Troizina (80) (where the surviving remains can be connected to specific narratives or epigraphic documents) are decidedly the exception. This means that the specific historical context of most fortified sites, as well their exact social and economic background, largely eludes us.

Thirdly, the lack of recorded, published and datable finds makes it nearly impossible to trace changes in the use of individual sites. The fortifications in the Argolid therefore lack reconstructable "site biographies", even though chronological changes in site function have been suggested for fortified sites elsewhere (for example, for the towers on the Paximadi Peninsula in southern Euboia)[922].

These three problems highlight the need for future studies that could throw new light on the precise chronology of rural fortified structures in the Argolid, for example systematic excavations (comparable to the research conducted by the Swedish Institute at Prosymna: Pyrgouthi (69) between 1995 and 1997) and intensive surface surveys (similar to the already mentioned *Mazi Archaeological Project* in Attica) at key sites and "micro-regions".[923] It also remains to be seen how the as yet largely unpublished *Western Argolid Regional Project (WARP)* will affect our understanding of rural fortifications in the northwestern part of the Argive territory.[924]

A further issue that has not been fully investigated is the relationship of the rural fortifications to the wider settlement pattern. In the Argolid, exploring this relationship in detail would require a systematic collection of non-fortified structures, both from the

[922] Seifried and Parkinson 2014, 304–11.
[923] For the importance of systematic excavations and intensive surveys in future fortification studies, see also Fachard 2016b, 83–4.
[924] For a preliminary report on this project, see Gallimore et al. 2017.

various surface surveys conducted in the region and from additional sources such as travellers' diaries, archaeological reports and short find notices. Given the current state of research in the Argolid, this immense task lies beyond the scope of the present study, so that certain aspects of the region's rural fortifications within the wider social-economic landscape (for example any possible connections to or contrasts with rural sanctuaries) may for the present well elude us.

Having said this, the Argolid as defined in the introduction is probably not an ideal case study for the relationship between fortified and non-fortified sites, as various parts of the region — especially the crucial Argive plain — have been heavily influenced by postdepositional processes that have concealed the ancient landscape under several meters of alluvia or have caused so much disturbance that only the most substantial ancient structures remain. In addition, the sheer size of the region prompts the question of how far a detailed collection of both fortified and unfortified sites would be feasible. For studies aiming to investigate the relationship between rural fortifications and the wider settlement pattern, it may thus be more promising to focus on individual parts of the region, for example the rural Thyreatis (where post-depositional processes so far seem less dramatic than elsewhere) or the strategically important and comparatively well-studied "micro-region" around ancient Mycenae.

Despite these shortcomings, the present study has achieved three important aims. Firstly, it has succeeded in "putting the rural fortifications of Argolid back on the map", both literally through locating the sites and metaphorically through the analysis and catalogue, which may spark new discussions and provide future scholars with the primary archaeological data necessary to re-examine the conclusions drawn here. The present study can thus become a "resource" for future fortification research both in the Argolid and beyond.

Secondly, the study has demonstrated the potential of a GIS-based contextual analysis of archaeological sites. The methods and approaches used to explore the rural fortifications in the Argolid can equally be applied to other regions and contribute to a multiplication of regional fortification corpora and studies. It is to be hoped that such regional projects will eventually provide sufficient results to serve as a basis for larger synthetic studies, exploring and contrasting not only the role of rural fortifications, but also wider socio-economic and political structures or different ancient concepts of borders and political territories. Such synthetic studies are highly desirable, but are currently limited by the comparatively small number of extant case studies — a situation that would improve considerably if studies like the present one (both comparatively cost-efficient and feasible with a very small team of researchers) became more widespread.

Thirdly, and perhaps most importantly, the present study has demonstrated that despite all the difficulties encountered — practical, methodological and chronological — rural fortifications have an unexpected and so far underappreciated potential for illuminating various aspects of the ancient world, including the interaction between natural environment and human activity, and the impact of different forms of conflict on everyday life in ancient communities. Rethinking the Argolid's rural fortifications as local structures with a social and economic, as well as a political and "strategic-military", significance allows us to write Greek history from archaeological sources and present an alternative and complementary account to the predominant narratives of the surviving literary sources.

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A LANDSCAPE OF CONFLICT?

RURAL FORTIFICATIONS IN THE ARGOLID (400 – 146 BC)

VOLUME I

PART 2: TABLES AND FIGURES

Thesis submitted for the Degree of Doctor of Philosophy

in Classical Archaeology

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1. TABLES

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2. FIGURES

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